Microsemi
Power Products Group

# Power Semiconductors
# Power Modules &
# RF Power MOSFETS
# 2008



# About Microsemi

Microsemi Power Products Group was created in 2006 with the acquisition of Advanced Power Technology, Inc., a company at the forefront of power semiconductor technology since its founding in 1984.

Our focus is on high voltage, high power and high performance applications. Our commitment is to maintain and enhance this position as a technological leader in MOS controlled devices and Diodes and to deliver products which contribute to our customers' success in delivering higher performance power systems.

Service… Outstanding technology is only part of the story. A global network of stocking distributors, representatives, applications engineers, and web tools are in place to support all phases of your product design, evaluation and procurement activities. In a world which demands superior execution, we've won numerous awards as a service leader.

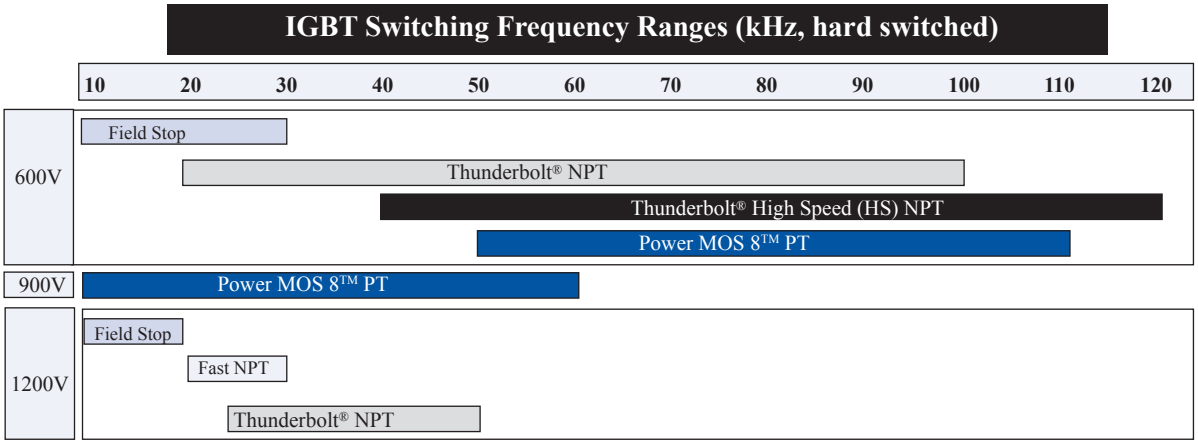
Quality… Our commitment is to excellence in all things we do. Whether you are evaluating the quality of our products, our technical assistance, our customer service or the quality of our internal communications systems, excellence is our standard. Continuous improvement is fundamental to our business!

## CONTENTS

# Insulated Gate Bipolar Transistors (IGBTs)

## IGBTs from Microsemi Power Products Group (PPG)

IGBT products from Microsemi PPG provide high quality solutions for a wide range of high voltage, high power applications. The switching frequency range spans from DC for minimal conduction loss to over 100kHz for very high power density SMPS applications. The frequency range for each product type is shown in the graph below. Each IGBT product represents the latest in IGBT technology, providing the best possible performance/cost combination for the targeted application. There are five product series that utilize three different IGBT technologies: Non-Punch-Through (NPT), Punch-Through (PT) and Field Stop.




| Standard Series | Voltage Ratings (V) | Technology | Easy to Parallel | Short Circuit SOA | Comment |
|---|---|---|---|---|---|
| Thunderbolt® | 600, 1200 | NPT | X | X | General purpose, high speed |
| Thundebolt® High Speed | 600 | NPT | X | X | Highest speed |
| FAST | 1200 | NPT | X | X | General purpose, medium speed |
| MOS 8™ | 600, 900 | PT | | | Highest efficiency |
| Field Stop Trench Gate | 600, 1200 | Field Stop | X | X | Lowest conduction loss |

## Product Options

All standard IGBT products are available as a single IGBT or as a Combi product packaged with an anti-parallel DQ series diode. Package options include TO-220, $D^3$, TO-247, T-Max®, TO-264, 264-MAX™ and SOT-227. Customized products are available; contact the factory for details.

**NEW!**

## Resonant Mode Combi

New in 2008 are Resonant Mode Combi products, which are high speed IGBTs packaged with a low VF anti-parallel DL series diode. These Combis are intended for use in resonant mode circuits, such as the phase shifted bridge, where fast turn-off of the IGBT is needed but the recovery speed of the anti-parallel diode is less important than its forward voltage. Resonant Mode IGBTs maximize efficiency by reducing turn-off switching loss in the IGBT and minimizing conduction loss of the anti-parallel diode. The table below summarizes the key features and technology for the Resonant Mode IGBT products.

| Resonant Mode Series | Voltage Ratings (V) | Technology | Easy to Parallel | Short Circuit SOA | Comment |
|---|---|---|---|---|---|
| Thunderbolt® | 600, 1200 | NPT | X | X | General purpose, high speed |
| Thunderbolt® High Speed | 600 | NPT | X | X | Highest speed |
| MOS 7 | 600 | PT | | | Highest efficiency |

# Insulated Gate Bipolar Transistors (IGBTs)

**NEW!**

## POWER MOS 8™

- PT Technology
- Fast Switching
- Highest Efficiency
- Combi with High Speed DQ Diode

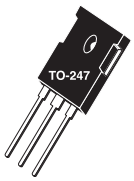
## FIELD STOP

- Trench Technology
- Short Circuit Rated
- Lowest Conduction Loss
- Easy Paralleling
- Combi with High Speed DQ Diode

| $BV_{CES}$ Volts | $V_{CE(ON)}$ Typ 25°C | $I_{C2}$ 100°C | Recommended Maximum $I_C$ | | Part Number | Package Style |
|---|---|---|---|---|---|---|
| **SINGLE** | | | 50 kHz | 80 kHz | | |
| 600 | 2.0 | 28 | 19 | 14 | APT28GA60K | TO-220 |
| | 2.0 | 36 | 21 | 17 | APT36GA60B | TO-247 or D³ |
| | 2.0 | 44 | 26 | 20 | APT44GA60B | TO-247 or D³ |
| | 2.0 | 54 | 30 | 23 | APT54GA60B | TO-247 or D³ |
| | 2.0 | 68 | 35 | 27 | APT68GA60B | TO-247 or D³ |
| | 2.0 | 80 | 40 | 31 | APT80GA60B | TO-247 or D³ |
| | 2.0 | 102 | 51 | 39 | APT102GA60B2 | T-MAX® or TO-264 |
| | | | 25 kHz | 50 kHz | | |
| 900 | 2.5 | 27 | 14 | 8 | APT27GA90K | TO-220 |
| | 2.5 | 35 | 17 | 10 | APT35GA90B | TO-247 or D³ |
| | 2.5 | 43 | 21 | 13 | APT43GA90B | TO-247 or D³ |
| | 2.5 | 64 | 29 | 19 | APT64GA90B | TO-247 or D³ |
| | 2.5 | 80 | 34 | 23 | APT80GA90B | TO-247 or D³ |
| **Combi (IGBT & "DQ" FRED)** | | | 50 kHz | 80 kHz | | |
| 600 | 2.0 | 28 | 19 | 14 | APT28GA60BD15 | TO-247 or D³ |
| | 2.0 | 36 | 21 | 17 | APT36GA60BD15 | TO-247 or D³ |
| | 2.0 | 44 | 26 | 20 | APT44GA60BD30 | TO-247 or D³ |
| | 2.0 | 47 | 39 | 30 | APT47GA60JD40 | ISOTOP® |
| | 2.0 | 54 | 30 | 23 | APT54GA60BD30 | TO-247 or D³ |
| | 2.0 | 60 | 48 | 36 | APT60GA60JD60 | ISOTOP® |
| | 2.0 | 68 | 35 | 27 | APT68GA60LD40 | TO-264 |
| | 2.0 | 80 | 40 | 31 | APT80GA60LD40 | TO-264 |
| | | | 25 kHz | 50 kHz | | |
| 900 | 2.5 | 27 | 14 | 8 | APT27GA90BD15 | TO-247 or D³ |
| | 2.5 | 35 | 17 | 10 | APT35GA90BD15 | TO-247 or D³ |
| | 2.5 | 43 | 21 | 13 | APT43GA90BD30 | TO-247 or D³ |
| | 2.5 | 46 | 33 | 21 | APT46GA90JD40 | ISOTOP® |
| | 2.5 | 64 | 29 | 19 | APT64GA90LD30 | TO-264 |
| | 2.5 | 80 | 34 | 23 | APT80GA90LD40 | TO-264 |
| **SINGLE** | | | 15 kHz | 30 kHz | | |
| 600 | 1.5 | 20 | 15 | 10 | APT20GN60KG | TO-220 |
| | 1.5 | 24 | 15 | 10 | APT20GN60BG | TO-247 or D³ |
| | 1.5 | 30 | 20 | 14 | APT30GN60KG | TO-220 |
| | 1.5 | 37 | 20 | 14 | APT30GN60BG | TO-247 or D3 |
| | 1.5 | 64 | 30 | 21 | APT50GN60BG | TO-247 or D³ |
| | 1.5 | 93 | 42 | 30 | APT75GN60BG | TO-247 or D³ |
| | 1.5 | 123 | 75 | 47 | APT150GN60J | ISOTOP® |
| | 1.5 | 135 | 54 | 39 | APT100GN60B2G | T-MAX® |
| | 1.5 | 190 | 79 | 57 | APT150GN60B2G | T-MAX® |
| | 1.5 | 230 | 103 | 75 | APT200GN60B2G | T-MAX® |
| | 1.5 | 158 | 100 | 66 | APT200GN60J | ISOTOP® |
| | | | 10 kHz | 20 kHz | | |
| 1200 | 1.7 | 22 | 14 | 10 | APT15GN120KG | TO-220 |
| | 1.7 | 33 | 19 | 13 | APT25GN120BG | TO-247 or D³ |
| | 1.7 | 46 | 24 | 17 | APT35GN120BG | TO-247 or D³ |
| | 1.7 | 57 | 36 | 22 | APT75GN120J | ISOTOP® |
| | 1.7 | 66 | 32 | 22 | APT50GN120B2G | T-MAX® |
| | 1.7 | 70 | 44 | 27 | APT100GN120J | ISOTOP® |
| | 1.7 | 99 | 45 | 30 | APT75GN120B2G | T-MAX® or TO-264 |
| | 1.7 | 120 | 58 | 38 | APT100GN120B2G | T-MAX® |
| | 1.7 | 99 | 60 | 36 | APT150GN120J | ISOTOP® |
| **Combi (IGBT & "DQ" FRED)** | | | 15 kHz | 30 kHz | | |
| 600 | 1.5 | 24 | 15 | 10 | APT20GN60BDQ1G | TO-247 or D³ |
| | 1.5 | 37 | 20 | 14 | APT30GN60BDQ2G | TO-247 or D³ |
| | 1.5 | 64 | 30 | 21 | APT50GN60BDQ2G | TO-247 or D³ |
| | 1.5 | 93 | 42 | 30 | APT75GN60LDQ3G | TO-264 |
| | 1.5 | 123 | 75 | 47 | APT150GN60JDQ4 | ISOTOP® |
| | 1.5 | 135 | 54 | 39 | APT100GN60LDQ4G | TO-264 |
| | 1.5 | 190 | 79 | 57 | APT150GN60LDQ4G | TO-264 |
| | 1.5 | 158 | 100 | 66 | APT200GN60JDQ4 | ISOTOP® |
| | | | 10 kHz | 20 kHz | | |
| 1200 | 1.7 | 22 | 14 | 10 | APT15GN120BDQ1G | TO-247 or D³ |
| | 1.7 | 33 | 19 | 13 | APT25GN120B2DQ2G | T-MAX® |
| | 1.7 | 46 | 24 | 17 | APT35GN120L2DQ2G | 264-MAX™ |
| | 1.7 | 57 | 36 | 22 | APT75GN120JDQ3 | ISOTOP® |
| | 1.7 | 66 | 32 | 22 | APT50GN120L2DQ2G | 264-MAX™ |
| | 1.7 | 70 | 44 | 27 | APT100GN120JDQ4 | ISOTOP® |
| | 1.7 | 99 | 60 | 36 | APT150GN120JDQ4 | ISOTOP® |

**Current @ Frequency Test Conditions:** Tj = 125°C, Tc = 100°C except Isotop® where Tc = 80°C, Vcc = 67% rated voltage Hard Switch

TO-220[K]

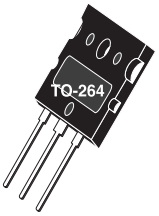


TO-247[B]

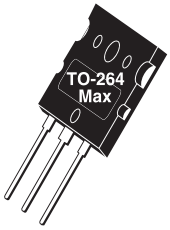
D³ PAK[S]

Part Numbers for D³ packages - replace B" with "S" in part number

T-MAX®[B2]

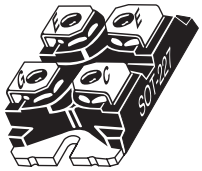


TO-264[L]

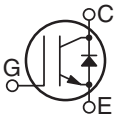


264-MAX™[L2]

Part Numbers for TO-264 packages - replace "B2" with "L" in part number



ISOTOP®[J]
SOT-227




All Products RoHS Compliant

# Insulated Gate Bipolar Transistors (IGBTs)

## THUNDERBOLT®

- NPT Technology
- Short Circuit Rated
- Moderate to High Frequency
- Easy Paralleling

## THUNDERBOLT® HIGH SPEED

- High Speed Switching - Reduced $E_{off}$
- Fastest Switching
- NPT Technology

## FAST

- NPT Technology
- Short Circuit Rated
- Low to Moderate Frequency
- Low Conduction Loss
- Easy Paralleling

## NEW!

## RESONANT MODE COMBI IGBTs

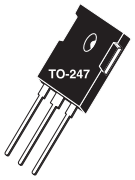
- NPT Technology
- PT Technology
- Low $V_F$ Diode
- Ultrasoft Recovery Diode
- "GT" and "GS" Avalanche Rated
- High Speed Switching - Reduced $E_{off}$

| $BV_{CES}$ Volts | $V_{CE(ON)}$ Typ 25°C | $I_{C2}$ 100°C | Recommended Maximum $I_C$ | | Part Number | Package Style |
|---|---|---|---|---|---|---|
| **SINGLE** | | | 30 kHz | 60 kHz | | |
| 600 | 2.0 | 15 | 11 | 8 | APT15GT60KRG | TO-220 |
| | 2.0 | 20 | 14 | 10 | APT20GT60KRG | TO-220 |
| | 2.0 | 20 | 14 | 10 | APT20GT60BRG | TO-247 or D³ |
| | 2.0 | 30 | 19 | 13 | APT30GT60KRG | TO-220 |
| | 2.0 | 30 | 19 | 13 | APT30GT60BRG | TO-247 or D³ |
| | 2.0 | 40 | 25 | 16 | APT40GT60BRG | TO-247 or D³ |
| | 2.0 | 50 | 30 | 20 | APT50GT60BRG | TO-247 or D³ |
| | 2.0 | 60 | 35 | 22 | APT60GT60BRG | TO-247 or D³ |
| | 2.0 | 48 | 29 | 18 | APT60GT60JR | ISOTOP® |
| | 2.0 | 100 | 56 | 35 | APT100GT60B2RG | T-MAX® or TO-264 |
| | 2.0 | 100 | 56 | 33 | APT200GT60JR | ISOTOP® |
| | | | 20 kHz | 40 kHz | | |
| 1200 | 3.2 | 18 | 11 | 8 | APT15GT120BRG | TO-247 or D³ |
| | 3.2 | 25 | 16 | 11 | APT25GT120BRG | TO-247 or D³ |
| | 3.2 | 50 | 27 | 17 | APT50GT120B2RG | T-MAX® or TO-264 |
| | 3.2 | 60 | 40 | 21 | APT100GT120JR | ISOTOP® |
| | 3.2 | 90 | 52 | 25 | APT150GT120JR | ISOTOP® |
| **Combi (IGBT & "DQ" FRED)** | | | 30 kHz | 60 kHz | | |
| 600 | 2.0 | 15 | 11 | 8 | APT15GT60BRDQ1G | TO-247 or D³ |
| | 2.0 | 20 | 14 | 10 | APT20GT60BRDQ1G | TO-247 or D³ |
| | 2.0 | 30 | 19 | 13 | APT30GT60BRDQ2G | TO-247 or D³ |
| | 2.0 | 48 | 29 | 18 | APT60GT60JRDQ3 | ISOTOP® |
| | 2.0 | 50 | 30 | 20 | APT50GT60BRDQ2G | TO-247 or D³ |
| | 2.0 | 100 | 37 | 22 | APT100GT60JRDQ4 | ISOTOP® |
| | 2.0 | 100 | 56 | 35 | APT200GT60JRDQ4 | ISOTOP® |
| | | | 20 kHz | 40 kHz | | |
| 1200 | 3.2 | 18 | 11 | 8 | APT15GT120BRDQ1G | TO-247 or D³ |
| | 3.2 | 25 | 16 | 11 | APT25GT120BRDQ2G | TO-247 or D³ |
| | 3.2 | 50 | 27 | 17 | APT50GT120B2RDQ2G | T-MAX® or TO-264 |
| | 3.2 | 42 | 34 | 19 | APT75GT120JRDQ3 | ISOTOP® |
| | 3.2 | 60 | 40 | 21 | APT100GT120JRDQ4 | ISOTOP® |
| **SINGLE** | | | 50 kHz | 80 kHz | | |
| 600 | 2.8 | 20 | 9 | 5 | APT20GS60KRG | TO-220 |
| | 2.8 | 30 | 14 | 9 | APT30GS60KRG | TO-220 |
| | 2.8 | 50 | 23 | 16 | APT50GS60BRG | TO-247 or D³ |
| **Combi (IGBT & "DQ" FRED)** | | | 50 kHz | 80 kHz | | |
| 600 | 2.8 | 20 | 9 | 5 | APT20GS60BRDQ1G | TO-247 or D³ |
| | 2.8 | 30 | 14 | 9 | APT30GS60BRDQ2G | TO-247 or D³ |
| | 2.8 | 50 | 23 | 16 | APT50GS60BRDQ2G | TO-247 or D³ |
| **SINGLE** | | | 15 kHz | 30 kHz | | |
| 1200 | 2.5 | 14 | 8 | 5 | APT11GF120KRG | TO-220 |
| | 2.5 | 20 | 11 | 7 | APT20GF120KRG | TO-220 |
| | 2.5 | 20 | 11 | 7 | APT20GF120BRG | TO-247 or D³ |
| | 2.5 | 35 | 16 | 10 | APT33GF120BRG | TO-247 or D³ |
| | 2.5 | 75 | 27 | 17 | APT50GF120B2RG | T-MAX® |
| | 2.5 | 75 | 27 | 17 | APT50GF120LRG | TO-264 |
| **Combi (IGBT & "DQ" FRED)** | | | 15 kHz | 30 kHz | | |
| 1200 | 2.5 | 14 | 8 | 5 | APT11GF120BRDQ1G | TO-247 or D³ |
| | 2.5 | 20 | 11 | 7 | APT20GF120BRDQ1G | TO-247 or D³ |
| | 2.5 | 35 | 16 | 10 | APT33GF120B2RDQ2G | T-MAX® |
| | 2.5 | 35 | 16 | 10 | APT33GF120LRDQ2G | TO-264 |
| | 2.5 | 42 | 24 | 15 | APT40GF120JRDQ2 | ISOTOP® |
| | 2.5 | 64 | 33 | 17 | APT50GF120JRDQ3 | ISOTOP® |
| | 2.5 | 80 | 42 | 20 | APT60GF120JRDQ3 | ISOTOP® |
| **Combi (IGBT & "DL" FRED)** | | | 50 kHz | 80 kHz | | |
| 600 | 2.8 | 50 | 23 | 16 | APT50GS60BRDLG | TO-247 |
| | 2.8 | 30 | 14 | 9 | APT30GS60BRDLG | TO-247 |
| | 2.2 | 50 | 41 | 31 | APT50GP60LDLG | TO-264 |
| | 2.2 | 45 | 28 | 22 | APT30GP60B2DLG | T-MAX® or TO-264 |
| | 2.2 | 25 | 17 | 14 | APT15GP60BDLG | TO-247 |
| | | | 30 kHz | 60 kHz | | |
| | 2.0 | 200 | 56 | 33 | APT200GT60JRDL | ISOTOP® |
| | 2.0 | 100 | 56 | 35 | APT100GT60JRDL | ISOTOP® |
| | 2.0 | 50 | 30 | 20 | APT50GT60BRDLG | TO-247 |
| | 2.0 | 30 | 14 | 10 | APT30GT60BRDLG | TO-247 |
| | | | 20 kHz | 40 kHz | | |
| 1200 | 3.2 | 25 | 16 | 11 | APT25GT120BRDLG | TO-247 |
| | 3.2 | 50 | 28 | 17 | APT50GT120B2RDLG | T-MAX® |
| | 3.2 | 100 | 40 | 21 | APT100GT120JRDL | ISOTOP® |

**Current @ Frequency Test Conditions:** Tj = 125°C, Tc = 100°C except Isotop® where Tc = 80°C, Vcc = 67% rated voltage Hard Switch


TO-220[K]

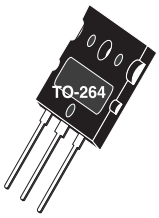

D³ PAK[S]




TO-247[B]

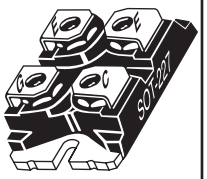
Part Numbers for D³ packages - replace "B" with "S" in part number


T-MAX®[B2]

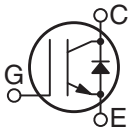



TO-264[L]

Part Numbers for L packages - replace "B2" with "L" in part number




ISOTOP®[J]
SOT-227




All Products RoHS Compliant

# NEW Power MOS 8™ MOSFETs / FREDFETs
## (fast body diode)

Power MOS 8™ is a new family of high speed, high voltage (500-1200V) N-channel switch-mode power transistors with lower EMI characteristics and lower cost compared to previous generation devices. These new MOSFETs /FREDFETs have been optimized for both hard and soft switching in high frequency, high voltage applications rated above 500W. There are 3 product types in the Power MOS 8™ MOSFET family:

1) **MOSFET**
2) **FREDFETs** have a fast recovery body diode characteristic, providing high commutation dv/dt ruggedness and high reliability in ZVS circuits.
3) **Ultrafast Recovery FREDFETs** have even faster recovery of the body diode for superior reliability in ZVS circuits.

**Features**

- Fast switching
- Low EMI
- Quiet switching
- Avalanche energy rated
- Low gate charge
- Lower cost

**Applications**

- Power factor correction
- Server and telecom power systems
- Solar inverters
- Arc welding
- Plasma cutting
- Battery chargers
- Medical
- Semiconductor capital equipment
- Induction heating

### Quiet Switching

The new Power MOS 8™ series is a result of extensive research into quiet switching. Input and reverse transfer capacitance values as well as their ratio were set at specific values to achieve quiet switching with minimal switching loss. The Power MOS 8™ series of devices are inherently quiet switching, stable when connected in parallel, very efficient, and lower cost than previous generations.

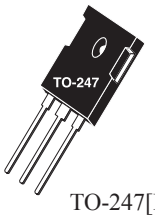
### Body Diode Options

As with previous generation products, Power MOS 8™ MOSFETs and FREDFETs are available in all voltage ratings. A FREDFET is a MOSFET with a faster recovery intrinsic body diode. New with Power MOS 8™ are Ultrafast Recovery FREDFET products, available in 500V and 600V ratings. The Ultrafast Recovery FREDFET has even faster body diode recovery speed. This results in improved reliability in ZVS circuits due to shorter minority carrier lifetime and increased commutation dv/dt ruggedness. There is a slight $R_{DS(on)}$ increase with the Ultrafast Recovery FREDFET. In some cases there is a choice of FREDFET or Ultrafast Recovery FREDFET to meet your cost/reliability requirements. If a fast recovery body diode is not needed, MOSFET versions are available.

# Power MOS 8™ MOSFETs / FREDFETs

| $BV_{(DSS)}$ Volts | $R_{DS(ON)}$ Max | $I_D$ | MOSFET Part # | $I_D$ | FREDFET Part # | Package Style |
|---|---|---|---|---|---|---|
| 1200 | 4.00 | 4 | APT4M120K | | | TO-220 |
| | 4.60 | | | 4 | APT4F120K | TO-220 |
| | 2.90 | | | 7 | APT7F120B | TO-247 or $D^3$ |
| | 2.50 | 7 | APT7M120B | | | TO-247 or $D^3$ |
| | 1.40 | | | 13 | APT13F120B | TO-247 or $D^3$ |
| | 1.20 | 14 | APT14M120B | | | TO-247 or $D^3$ |
| | 0.80 | | | 22 | APT22F120B2 | T-MAX® or TO-264 |
| | 0.68 | 24 | APT24M120B2 | | | T-MAX® or TO-264 |
| | 0.65 | | | 26 | APT26F120B2 | T-MAX® or TO-264 |
| | 0.65 | | | 17 | APT17F120J | ISOTOP® |
| | 0.56 | 28 | APT28M120B2 | | | T-MAX® or TO-264 |
| | 0.56 | 19 | APT19M120J | 17 | | |
| | 0.35 | | | 32 | APT32F120J | ISOTOP® |
| | 0.30 | 34 | APT34M120J | | | ISOTOP® |
| 1000 | 2.90 | | | 5 | APT5F100K | TO-220 |
| | 2.50 | 6 | APT6M100K | | | TO-220 |
| | 2.00 | | | 7 | APT7F100B | TO-247 |
| | 1.80 | 8 | APT8M100B | | | TO-247 or $D^3$ |
| | 1.70 | | | 9 | APT9F100B | TO-247 or $D^3$ |
| | 1.50 | 9 | APT9M100B | | | TO-247 or $D^3$ |
| | 1.00 | | | 14 | APT14F100B | TO-247 or $D^3$ |
| | 0.90 | 14 | APT14M100B | | | TO-247 or $D^3$ |
| | 0.80 | | | 17 | APT17F100B | TO-247 or $D^3$ |
| | 0.70 | 18 | APT18M100B | | | TO-247 or $D^3$ |
| | 0.46 | | | 29 | APT29F100B2 | T-MAX® or TO-264 |
| | 0.46 | | | 19 | APT19F100J | ISOTOP® |
| | 0.40 | 31 | APT31M100B2 | 34 | APT34F100B2 | T-MAX® or TO-264 |
| | 0.40 | 21 | APT21M100J | 22 | APT22F100J | ISOTOP® |
| | 0.33 | 37 | APT37M100B2 | | | T-MAX® or TO-264 |
| | 0.33 | 25 | APT25M100J | | | ISOTOP® |
| | 0.21 | | | 41 | APT41F100J | ISOTOP® |
| | 0.18 | 45 | APT45M100J | | | ISOTOP® |
| 800 | 1.70 | | | 7 | APT7F80K | TO-220 |
| | 1.50 | 8 | APT8M80K | | | TO-220 |
| | 1.00 | | | 11 | APT11F80B | TO-247 or $D^3$ |
| | 0.90 | 12 | APT12M80B | | | TO-247 or $D^3$ |
| | 0.65 | | | 17 | APT17F80B | TO-247 or $D^3$ |
| | 0.56 | 18 | APT18M80B | | | TO-247 or $D^3$ |
| | 0.50 | | | 22 | APT22F80B | TO-247 or $D^3$ |
| | 0.43 | 24 | APT24M80B | | | TO-247 or $D^3$ |
| | 0.28 | | | 38 | APT38F80B2 | T-MAX® or TO-264 |
| | 0.24 | 41 | APT41M80B2 | 44 | APT44F80B2 | T-MAX® or TO-264 |
| | 0.24 | | | 29 | APT29F80J | ISOTOP® |
| | 0.21 | 48 | APT48M80B2 | | | T-MAX® or TO-264 |
| | 0.21 | 32 | APT32M80J | | | ISOTOP® |
| | 0.13 | | | 53 | APT53F80J | ISOTOP® |
| | 0.11 | 58 | APT58M80J | | | ISOTOP® |


TO-220[K]

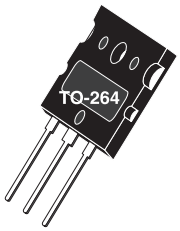



TO-247[B]


$D^3$ PAK[S]

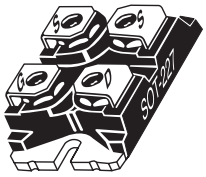
Part Numbers for $D^3$ packages - replace B" with "S" in part number


T-MAX®[B2]




TO-264[L]

Part Numbers for TO-264 packages - replace "B2" with "L" in part number




ISOTOP®[J]
SOT-227
(ISOLATED BASE)

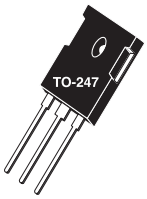
All Products RoHS Compliant

# Power MOS 8™ MOSFETs / FREDFETs

Ultrafast Recovery FREDFETs have even faster recovery of the body diode for superior reliability in ZVS circuits

| $BV_{(DSS)}$ Volts | $R_{DS(ON)}$ Max | $I_D$ | MOSFET Part # | $I_D$ | FREDFET Part # | $I_D$ | Ultrafast Recovery FREDFET Part# | Package |
|---|---|---|---|---|---|---|---|---|
| 600 | 0.62 | | | 12 | APT12F60K | | | TO-220 |
| | 0.48 | | | 15 | APT15F60B | | | TO-247 or D³ |
| | 0.42 | | | | | 18 | APT18H60B | TO-247 or D³ |
| | 0.39 | | | 18 | APT18F60B | | | TO-247 or D³ |
| | 0.31 | | | 23 | APT23F60B | | | TO-247 or D³ |
| | 0.25 | | | 28 | APT28F60B | | | TO-247 or D³ |
| | 0.23 | | | | | 33 | APT33H60B | TO-247 or D³ |
| | 0.21 | 34 | APT34M60B | 34 | APT34F60B | | | TO-247 or D³ |
| | 0.16 | 43 | APT43M60B2 | 43 | APT43F60B2 | | | T-MAX® or TO-264 |
| | 0.16 | 30 | APT30M60J | 30 | APT30F60J | | | ISOTOP® |
| | 0.13 | 56 | APT56M60B2 | 56 | APT56F60B2 | | | T-MAX® or TO-264 |
| | 0.13 | 39 | APT39M60J | 39 | APT39F60J | | | ISOTOP® |
| | 0.11 | | | | | 63 | APT63H60B2 | T-MAX® or TO-264 |
| | 0.11 | | | | | 44 | APT44H60J | ISOTOP® |
| | 0.10 | 66 | APT66M60B2 | | | | | T-MAX® or TO-264 |
| | 0.10 | 47 | APT47M60J | | | | | ISOTOP® |
| | 0.065 | | | | | 77 | APT77H60J | ISOTOP® |
| | 0.060 | 80 | APT80M60J | | | | | ISOTOP® |
| 500 | 0.39 | | | 15 | APT15F50K | | | TO-220 |
| | 0.30 | | | 20 | APT20F50B | | | TO-247 or D³ |
| | 0.26 | | | | | 23 | APT23H50B | TO-247 or D³ |
| | 0.24 | | | 24 | APT24F50B | | | TO-247 or D³ |
| | 0.19 | | | 30 | APT30F50B | | | TO-247 or D³ |
| | 0.15 | | | 37 | APT37F50B | 41 | APT41H50B | TO-247 or D³ |
| | 0.14 | | | 42 | APT42F50B | | | TO-247 or D³ |
| | 0.10 | 56 | APT56M50B2 | 56 | APT56F50B2 | | | T-MAX® or TO-264 |
| | 0.10 | 38 | APT38M50J | 38 | APT38F50J | | | ISOTOP® |
| | 0.075 | 75 | APT75M50B2 | 75 | APT75F50B2 | | | T-MAX® or TO-264 |
| | 0.075 | 51 | APT51M50J | 51 | APT51F50J | | | ISOTOP® |
| | 0.070 | | | | | 81 | APT81H50B2 | T-MAX® or TO-264 |
| | 0.070 | | | | | 56 | APT56H50J | ISOTOP® |
| | 0.065 | 84 | APT84M50B2 | | | | | T-MAX® or TO-264 |
| | 0.065 | 58 | APT58M50J | | | | | ISOTOP® |
| | 0.041 | | | | | 97 | APT97H50J | ISOTOP® |
| | 0.038 | 100 | APT100M50J | | | | | ISOTOP® |
| | 0.107 | | | | | 54 | APT54H50B2 | T-MAX® or TO-264 |
| **Low Voltage Power MOS V® MOSFETs / FREDFETs** | | | | | | | | |
| 300 | 0.085 | 40 | APT30M85BVRG | 40 | APT30M85BVFRG | | | TO-247 or D³ |
| | 0.070 | 48 | APT30M70BVRG | 48 | APT30M70BVFRG | | | TO-247 or D³ |
| | 0.040 | 70 | APT30M40JVRG | 70 | APT30M40JVFRG | | | ISOTOP® |
| | 0.019 | 130 | APT30M19JVR | 130 | APT30M19JVFR | | | ISOTOP® |
| 200 | 0.045 | 56 | APT20M45BVRG | 56 | APT20M45BVFRG | | | TO-247 or D³ |
| | 0.038 | 67 | APT20M38BVRG | 37 | APT20M38BVFRG | | | TO-247 or D³ |
| | 0.022 | 100 | APT20M22B2VRG | 100 | APT20M22B2VFRG | | | T-MAX® or TO-264 |
| | 0.011 | 175 | APT20M11JVR | 175 | APT20M11JVFR | | | ISOTOP® |


TO-220[K]

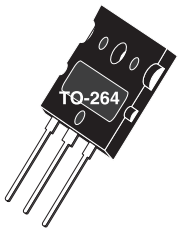



TO-247[B]


D³ PAK[S]

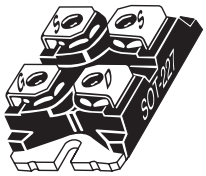
Part Numbers for D³ packages - replace "B" with "S" in part number


T-MAX®[B2]




TO-264[L]

Part Numbers for TO-264 packages - replace "B2" with "L" in part number




ISOTOP®[J]
SOT-227
(ISOLATED BASE)

For additional Ultrafast Recovery FREDFET part numbers contact the factory.

All Products RoHS Compliant

# Ultrafast, Low Gate Charge MOSFETs

## FOR 250 kHz - 2 MHz SWITCHING APPLICATIONS

The Ultrafast, Low Gate Charge MOSFET family combines the lowest gate charge available in the industry with Microsemi's proprietary self-aligned aluminum metal gate structure. The result is a MOSFET capable of extremely fast switching speeds and very low switching losses. The metal gate structure and the layout of these chips provide an internal series gate resistance (EGR) an order of magnitude lower than competitive devices built with a polysilicon gate.

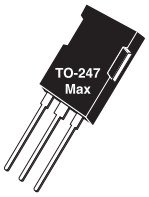
These devices are ideally suited for high frequency and pulsed high voltage applications.

**Typical Applications:**

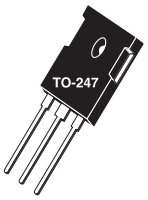
- Class D amplifiers up to 2 MHz
- High voltage pulsed DC
- AM transmitters
- Plasma deposition/etch

| FEATURES: | BENEFITS: |
|---|---|
| • Series Gate Resistance (Rg) <0.1 ohm | • Fast switching uniform signal propagation |
| • Tr and Tf times of <10ns | • Pulse power applications |
| • Industry's Lowest Gate Charge | • Fast switching, reduced gate drive power |

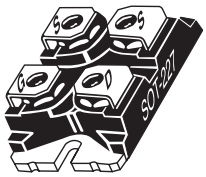
| $BV_{(DSS)}$ Volts | $R_{DS(ON)}$ Max | $I_D$ | MOSFET Part # | Package Style |
|---|---|---|---|---|
| 1200 | 0.670 | 18 | APT12067B2LLG | T-MAX® |
| | 0.670 | 17 | APT12067JLL | ISOTOP® |
| | 0.570 | 22 | APT12057B2LLG | T-MAX® |
| | 0.570 | 19 | APT12057JLL | ISOTOP® |
| | 0.310 | 30 | APT12031JLL | ISOTOP® |
| 1000 | 0.450 | 23 | APT10045B2LLG | T-MAX® |
| | 0.450 | 21 | APT10045JLL | ISOTOP® |
| | 0.350 | 28 | APT10035B2LL | T-MAX® |
| | 0.350 | 25 | APT10035JLL | ISOTOP® |
| 800 | 0.240 | 31 | APT8024B2LL | T-MAX® |
| | 0.24 | 29 | APT8024JLL | ISOTOP® |
| | 0.200 | 38 | APT8020B2LL | T-MAX® |
| | 0.200 | 33 | APT8020JLL | ISOTOP® |
| | 0.140 | 42 | APT8014JLL | ISOTOP® |
| 500 | 0.240 | 22 | APT5024BLLG | TO-247 |
| | 0.180 | 27 | APT5018BLLG | TO-247 |
| | 0.140 | 35 | APT5014BLLG | TO-247 |
| | 0.100 | 46 | APT5010B2LLG | T-MAX® |
| | 0.075 | 57 | APT50M75B2LLG | T-MAX® |
| | 0.050 | 71 | APT50M50JLL | ISOTOP® |
| | 0.038 | 88 | APT50M38JLL | ISOTOP® |



T-MAX®[B2]



TO-247[B]



ISOTOP®[J]
SOT-227
(ISOLATED BASE)

All Products RoHS Compliant

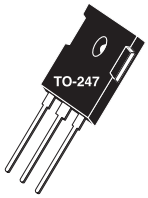
COOLMOS
Power Semiconductors

# COOLMOS™ MOSFETs

| $BV_{DSS}$ Volts | $R_{DS(ON)}$ Ohms | $I_{D(Cont)}$ Amps | Part Number | Package Style |
|---|---|---|---|---|
| | C3 TECHNOLOGY | | | |
| 800 | 0.450 | 11 | APT11N80KC3G | TO-220 |
| | 0.450 | 11 | APT11N80BC3G | TO-247 |
| | 0.145 | 34 | APT34N80B2C3G | T-MAX® |
| | 0.145 | 34 | APT34N80LC3G | TO-264 |
| | 0.145 | 31 | APT31N80JC3 | ISOTOP® |
| 600 | 0.070 | 47 | APT47N60BC3G | TO-247 |
| | 0.070 | 47 | APT47N60SC3G | $D^3$ |
| | 0.035 | 77 | APT77N60JC3 | ISOTOP® |
| | COOLMOS FREDFETS | | | |
| 600 | 0.083 | 40 | APT47N60BCFG | TO-247 |
| | 0.078 | 62 | APT62N60JCF | ISOTOP® |
| | SERVER SERIES | | | |
| | 0.045 | 60 | APT60N60BCSG | TO-247 |
| | 0.042 | 94 | APT94N60L2C3G | 264-MAX™ |
| | 0.023 | 82 | APT82N60JCS | ISOTOP® |

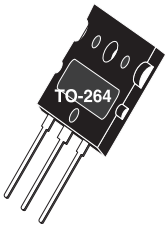
TO-220[K]

$D^3$ PAK[S]
TO-268

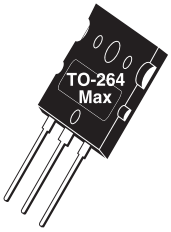


TO-247[B]

T-MAX®[B2]

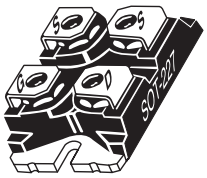


TO-264[L]



264-MAX™ [L2]

ISOTOP®[J]
SOT-227
(ISOLATED BASE)




"COOLMOS" comprise a new family of transistors developed by Infineon Technologies AG.
"COOLMOS" is a trademark of Infineon Technologies AG"

# Linear MOSFETs

### What is a Linear MOSFET?

A MOSFET specifically designed to be more robust than a standard MOSFET when operated with both high voltage and high current near DC conditions (>100msecs).

### The Problem with SMPS MOSFETs

MOSFETs optimized for high frequency SMPS applications have poor high voltage DC SOA. Most SMPS type MOSFETs over-state SOA capability at high voltage on the data sheets. Above ~30V and DC conditions, SOA drops faster than is indicated by $P_D$ limited operation.

For pulsed loads (t<10ms) there is generally no problem using a standard MOSFET.

### Technology Innovation

Introduced in 1999, Microsemi modified its proprietary patented self-aligned metal gate MOSFET technology for enhanced performance in high voltage, linear applications. These Linear MOSFETs typically provide 1.5-2.0 times the DC SOA capability at high voltage compared to other MOSFET technologies optimized for switching applications.

### Designers will need Linear MOSFETs when…

- High Current & > 200V >100msec
- Used as a variable power resistor
- Soft start application (limit surge currents)
- Linear amplifier circuit

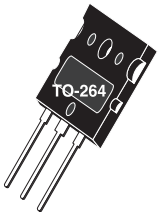
### Typical Applications…

- Active loads above 200 volts such as DC dynamic loads for testing power supplies, batteries, fuel cells, etc.
- High voltage, high current constant current sources.

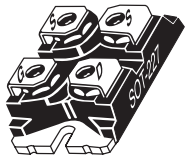
| $BV_{DSS}$ Volts | $R_{DS(ON)}$ Ohms | $I_{D(Cont)}$ Amps | SOA Watts | Part Number | Package Style |
|---|---|---|---|---|---|
| 1000 | 0.600 | 18 | 325 | APL1001J | |
| 600 | 0.125 | 49 | 325 | APL602B2G | |
| | 0.125 | 43 | 325 | APL602J | |
| 500 | 0.090 | 58 | 325 | APL502B2G | |
| | 0.090 | 52 | 325 | APL502J | |

Part Numbers for TO-264 packages - replace "B2" with "L" in part number

T-MAX®[B2]



TO-264[L]



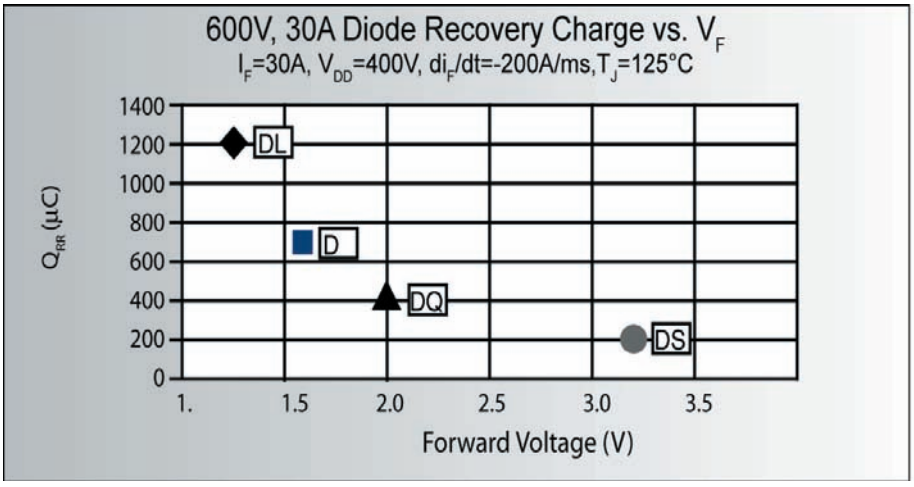
ISOTOP®[J]
SOT-227
(ISOLATED BASE)

All Products RoHS Compliant

Microsemi PPG offers five series of discrete diode products: a new **DL** series low $V_F$ ultra-soft recovery, the medium speed medium $V_F$ **D** series, the high speed **DQ** series, the very high speed **DS** series, and the silicon Schottky **S** series. These series of diodes are designed to provide high quality solutions to a wide range of high voltage, high power application requirements, ranging from fast recovery for continuous conduction mode power factor correction to low conduction loss for output rectification. Distinguishing features, technology used, and applications for each product family are summarized in the table below.

| Series | Voltage Ratings | Features | Applications | Comment |
|---|---|---|---|---|
| NEW! **DL** | 600 | Low $V_F$<br>Ultra-soft recovery<br>Avalanche Rated | Output rectifier<br>Resonant circuits | Ultra-soft recovery minimizes or eliminates snubber |
| **D** | 200, 300, 400, 600, 1000, 1200 | Medium $V_F$<br>Medium Speed | Freewheeling Diode<br>Output rectifier<br>DC-DC converter | Proprietary platinum process |
| **DQ** | 600, 1000, 1200 | High speed<br>Avalanche Rated | PFC<br>Freewheeling Diode<br>DC-DC converter | Stepped epi improves softness<br>Proprietary platinum process |
| **DS** | 600 | Very high speed | High frequency PFC | Proprietary platinum process |
| **Schottky** | 200 | Low $V_F$<br>Avalanche rated | Output rectifier<br>Freewheeling Diode<br>DC-DC converter | |

The graph below shows the relative recovery speed and forward voltage positions of 600V DL, D, DQ and DS series diodes.



# Ultra Fast Recovery Diodes

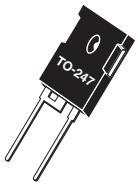
**NEW - "DL" DIODES**

| Volts | $I_{F(avg)}$ Amps | $V_F$ (volts) Typ 25°C | $t_{RR}$(ns) Typ 25°C | $Q_{RR}$ (nC) Typ 125°C at $I_F = I_F$ (avg) | Diode Series | Part Number | Package Style |
|---|---|---|---|---|---|---|---|
| SINGLE | 15 | 2.8 | 21 | 960 | DQ | APT15DQ120BG | TO-247 |
| | 15 | 2.8 | 21 | 960 | DQ | APT15DQ120KG | TO-220 |
| | 15 | 2.0 | 32 | 1300 | D | APT15D120BG | TO-247 |
| 1200 | 15 | 2.0 | 32 | 1300 | D | APT15D120KG | TO-220 |
| | 30 | 2.8 | 24 | 1800 | DQ | APT30DQ120BG | TO-247 |
| | 30 | 2.8 | 24 | 1800 | DQ | APT30DQ120KG | TO-220 |
| | 30 | 2.0 | 31 | 3450 | D | APT30D120BG | TO-247 |
| | 40 | 2.8 | 26 | 2200 | DQ | APT40DQ120BG | TO-247 |
| | 60 | 2.8 | 30 | 2800 | DQ | APT60DQ120BG | TO-247 |
| | 60 | 2.0 | 38 | 4000 | D | APT60D120BG | TO-247 |
| | 75 | 2.8 | 32 | 3340 | DQ | APT75DQ120BG | TO-247 |
| | 15 | 2.5 | 20 | 810 | DQ | APT15DQ100BG | TO-247 |
| | 15 | 2.5 | 20 | 810 | DQ | APT15DQ100KG | TO-220 |
| | 15 | 1.9 | 28 | 1550 | D | APT15D100KG | TO-220 |
| 1000 | 30 | 2.5 | 22 | 1250 | DQ | APT30DQ100BG | TO-247 |
| | 30 | 2.5 | 22 | 1250 | DQ | APT30DQ100KG | TO-247 |
| | 30 | 1.9 | 29 | 2350 | D | APT30D100BG | TO-247 |
| | 40 | 2.5 | 24 | 1430 | DQ | APT40DQ100BG | TO-247 |
| | 60 | 2.5 | 29 | 2325 | DQ | APT60DQ100BG | TO-247 |
| | 60 | 1.9 | 34 | 3600 | D | APT60D100BG | TO-247 |
| | 75 | 2.5 | 33 | 2660 | DQ | APT75DQ100BG | TO-247 |
| | 8 | 2.0 | 14 | 160 | DQ | APT8DQ60KG | TO-220 |
| | 15 | 2.0 | 16 | 250 | DQ | APT15DQ60BG | TO-247 |
| | 15 | 2.0 | 16 | 250 | DQ | APT15DQ60KG | TO-220 |
| | 15 | 1.6 | 21 | 520 | D | APT15D60BG | TO-247 |
| 600 | 15 | 1.6 | 21 | 520 | D | APT15D60KG | TO-220 |
| | 30 | 2.0 | 19 | 400 | DQ | APT30DQ60BG | TO-247 |
| | 30 | 2.0 | 19 | 400 | DQ | APT30DQ60KG | TO-220 |
| | 30 | 1.6 | 23 | 700 | D | APT30D60BG | TO-247 |
| | 30 | 1.25 | 35 | 3800 | DL | APT30DL60BG | TO-247 |
| | 40 | 2.0 | 22 | 480 | DQ | APT40DQ60BG | TO-247 |
| | 50 | 1.25 | 38 | 3800 | DL | APT50DL60BG | TO-247 |
| | 60 | 2.0 | 26 | 640 | DQ | APT60DQ60BG | TO-247 |
| | 60 | 1.6 | 40 | 920 | D | APT60D60BG | TO-247 |
| | 75 | 2.0 | 29 | 650 | DQ | APT75DQ60BG | TO-247 |
| | 75 | 1.25 | 42 | 3800 | DL | APT75DL60BG | TO-247 |
| | 100 | 1.25 | 45 | 3800 | DL | APT100DL60BG | TO-247 |
| | 150 | 1.25 | 53 | 3800 | DL | APT150DL60B2G | T-MAX® |
| 400 | 30 | 1.3 | 22 | 360 | D | APT30D40BG | TO-247 |
| | 60 | 1.3 | 30 | 540 | D | APT60D40BG | TO-247 |
| | 15 | 0.80 | 20 | 440 | Schottky | APT15S20KG | TO-220 |
| | 30 | 1.1 | 21 | 150 | D | APT30D20BG | TO-247 |
| 200 | 30 | 0.83 | 25 | 448 | Schottky | APT30S20BG | TO-247 |
| | 60 | 1.1 | 30 | 250 | D | APT60D20BG | TO-247 |
| | 60 | 0.83 | 35 | 490 | Schottky | APT60S20BG | TO-247 |
| | 100 | 0.89 | 40 | 690 | Schottky | APT100S20BG | TO-247 |
| TANDEM, DS DIODES FOR PFC BOOST APPLICATIONS | | | | | | | |
| 600 | 15 | 3.2 | 13 | 85 | DS | APT15DS60BG | TO-247 |
| | 30 | 3.2 | 17 | 180 | DS | APT30DS60BG | TO-247 |

(2, 300V Diodes Connected In Series)

TO-220[K]

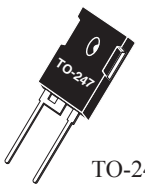

D³ PAK[S]
TO-268




TO-247[B]


T-MAX®[B2]

Part Numbers for D³ packages - replace "B" with "S" in part number

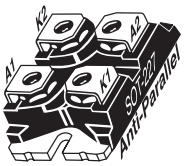



TO-247[B]

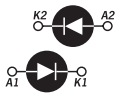
All Products RoHS Compliant

# Ultra Fast Recovery Diodes

| Volts | $I_{F(avg)}$ Amps | $V_F$ (volts) Typ 25°C | $t_{RR}$(ns) Typ 25°C | $Q_{RR}$ (nC) Typ 125°C at $I_F = I_F(avg)$ | Diode Series | Part Number | Package Style |
|---|---|---|---|---|---|---|---|
| DUAL | 2x27 | 2.0 | 31 | 3450 | D | APT2X30D120J | |
| | 2x30 | 2.6 | 25 | 1800 | DQ | APT2X30DQ120J | |
| 1200 | 2x53 | 2.0 | 38 | 4000 | D | APT2X60D120J | |
| | 2x60 | 2.5 | 30 | 2890 | DQ | APT2X60DQ120J | |
| | 2x93 | 2.0 | 47 | 5350 | D | APT2X100D120J | |
| | 2x100 | 2.4 | 45 | 5240 | DQ | APT2X100DQ120J | |
| | 2x28 | 1.9 | 29 | 2350 | D | APT2X30D100J | |
| | 2x55 | 1.9 | 34 | 3600 | D | APT2X60D100J | |
| 1000 | 2x60 | 2.2 | 30 | 2350 | DQ | APT2X60DQ100J | |
| | 2x95 | 1.9 | 43 | 4050 | D | APT2X100D100J | |
| | 2x100 | 2.1 | 45 | 3645 | DQ | APT2X100DQ100J | |
| | 2x30 | 1.8 | 20 | 400 | DQ | APT2X30DQ60J | |
| | 2x30 | 1.6 | 23 | 700 | D | APT2X30D60J | |
| 600 | 2x60 | 1.7 | 27 | 650 | DQ | APT2X60DQ60J | ISOTOP® |
| | 2x60 | 1.6 | 40 | 920 | D | APT2X60D60J | |
| | 2x100 | 1.6 | 30 | 980 | DQ | APT2X100DQ60J | |
| | 2x100 | 1.6 | 34 | 1450 | D | APT2X100D60J | |
| | 2x150 | 1.25 | 53 | 3800 | DL | APT2X150DL60J | |
| | 2x30 | 1.3 | 22 | 360 | D | APT2X30D40J | |
| 400 | 2x60 | 1.3 | 30 | 540 | D | APT2X60D40J | |
| | 2x100 | 1.3 | 37 | 1050 | D | APT2X100D40J | |
| | 2x30 | 0.80 | 25 | 448 | Schottky | APT2X31S20J | |
| 200 | 2x60 | 0.83 | 35 | 490 | Schottky | APT2X61S20J | |
| | 2x100 | 1.1 | 39 | 840 | D | APT2X100D20J | |
| | 2x100 | 0.89 | 40 | 690 | Schottky | APT2X101S20J | |
| | 2x15 | 2.5 | 20 | 810 | DQ | APT15DQ100BCTG | TO-247 [BCT] |
| | 2x15 | 1.9 | 28 | 1550 | D | APT15D100BHBG | TO-247 [BHB] |
| | 2x30 | 2.5 | 22 | 1250 | DQ | APT30DQ100BCTG | TO-247 [BCT] |
| 1000 | 2x30 | 1.9 | 30 | 2350 | D | APT30D100BHBG | TO-247 [BHB] |
| | 2x30 | 1.9 | 30 | 2350 | D | APT30D100BCAG | TO-247 [BCA] |
| | 2x40 | 2.5 | 24 | 1430 | DQ | APT40DQ100BCTG | TO-247 [BCT] |
| | 2x60 | 2.5 | 29 | 2325 | DQ | APT60DQ100LCTG | TO-264 [LCT] |
| | 2x60 | 1.9 | 35 | 3600 | D | APT60D100LCTG | TO-264 [LCT] |
| | 2x8 | 2.0 | 15 | 160 | DQ | APT8DQ60KCTG | TO-220 [KCT] |
| | 2x15 | 2.0 | 15 | 250 | DQ | APT15DQ60BCTG | TO-247 [BCT] |
| | 2x15 | 1.6 | 20 | 520 | D | APT15D60BCAG | TO-247 [BCA] |
| | 2x30 | 2.0 | 22 | 480 | DQ | APT30DQ60BHBG | TO-247 [BHB] |
| 600 | 2x30 | 2.0 | 19 | 400 | DQ | APT30DQ60BCTG | TO-247 [BCT] |
| | 2x30 | 1.6 | 23 | 700 | D | APT30D60BCTG | TO-247 [BCT] |
| | 2x30 | 1.6 | 25 | 700 | D | APT30D60BHBG | TO-247 [BHB] |
| | 2x30 | 1.6 | 25 | 700 | D | APT30D60BCAG | TO-247 [BCA] |
| | 2x30 | 1.25 | 35 | 3800 | DL | APT30DL60BCTG | TO-247 [BCT] |
| | 2x40 | 2.0 | 22 | 480 | DQ | APT40DQ60BCTG | TO-247 [BCT] |
| | 2X50 | 1.25 | 38 | 3800 | DL | APT50DL60BCTG | TO-247 [BCT] |
| | 2x60 | 2.0 | 26 | 640 | DQ | APT60DQ60BCTG | TO-247 [BCT] |
| | 2x60 | 1.6 | 30 | 920 | D | APT60D60LCTG | TO-264 [LCT] |
| 400 | 2x60 | 1.3 | 30 | 540 | D | APT60D40LCTG | TO-264 [LCT] |
| | 2x15 | 0.80 | 20 | 440 | Schottky | APT15S20KCTG | TO-220 [KCT] |
| | 2x15 | 0.80 | 20 | 440 | Schottky | APT15S20BCTG | TO-247 [BCT] |
| | 2x30 | 1.1 | 21 | 150 | D | APT30D20BCAG | TO-247 [BCA] |
| 200 | 2x30 | 0.80 | 25 | 448 | Schottky | APT30S20BCTG | TO-247 [BCT] |
| | 2x60 | 1.1 | 30 | 250 | D | APT60D20LCTG | TO-264[LCT] |
| | 2x60 | 0.83 | 35 | 490 | Schottky | APT60S20B2CTG | T-MAX® [B2CT] |
| | 2x100 | 0.89 | 40 | 690 | Schottky | APT100S20LCTG | TO-264[LCT] |

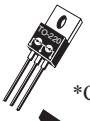



ISOTOP®[J] SOT-227
Antiparallel
Configuration
(ISOLATED BASE)

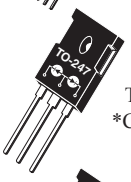



Part Numbers for Parallel Configuration replace 30, 60, or 100 with 31, 61, or 101. Except Schottky

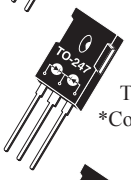
Example: 2X30D120J becomes 2X31D120J



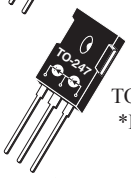

TO-220[KCT]
*Common Cathode



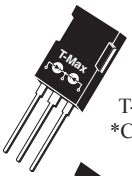

TO-247[BCA]
*Common Anode



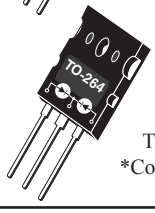

TO-247[BCT]
*Common Cathode




TO-247[BHB]
*Half Bridge




T-MAX® [B2CT]
*Common Cathode




TO-264[LCT]
*Common Cathode

*Current ratings per leg

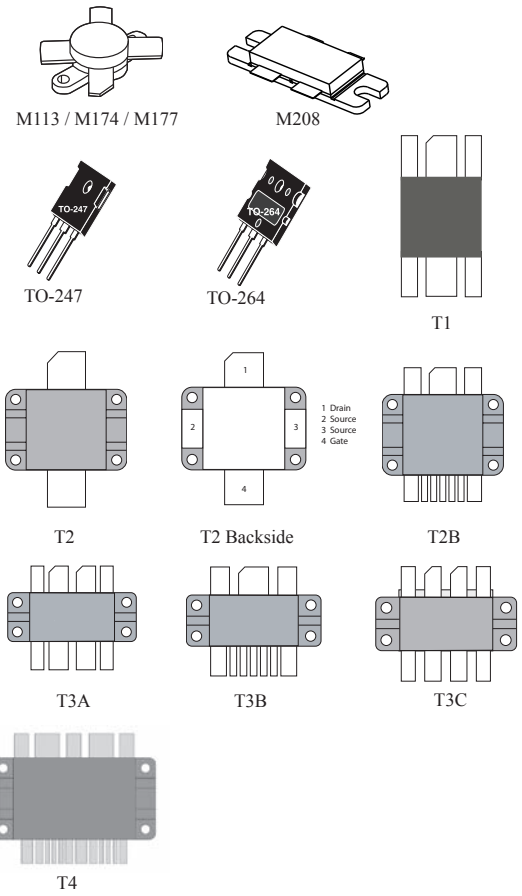
All Products RoHS Compliant

## High Voltage RF MOSFETs

The ARF family of RF Power MOSFETs are optimized for applications requiring frequencies as high as 150MHz and operating voltages as high as 400V. Historically, RF Power MOSFETs were limited to applications of 50V or less. This limitation has been removed by combining Microsemi's high voltage MOSFET technology with RF specific die geometries.

Why Higher Voltage? Higher $V_{DD}$ means higher load impedance. For 150W output from a 50V supply the load impedance is only 8 ohms. At 125V, the load impedance is 50 ohms. The higher impedance allows simpler transformers and combiners. Paralleled devices can still operate into reasonable and convenient impedances. The increased operating voltage also lowers the DC current required for any given power output increasing efficiency and reducing the size, weight and cost of other system components.

| Pout (W) | Freq. (MHz) | $V_{DD}/BV_{DSS}$ (V) | θJC (°C/W) | Package Style | Part Number | Class of Operation |
|---|---|---|---|---|---|---|
| 90 | 120 | 150V/450V | 0.76 | TO-247 | ARF449AG/BG | C-E |
| 100 | 100 | 125V/500V | 0.70 | TO-247 | ARF463AG/BG | A-E |
| | 100 | 125V/500V | 0.70 | TO-247 | ARF463AP1G/BP1G | A-E |
| 140 | 65 | 250V/900V | 0.55 | TO-247 | ARF446G | C-E |
| | 65 | 250V/900V | 0.55 | TO-247 | ARF447G | C-E |
| | 65 | 150V/450V | 0.55 | TO-247 | ARF448AG/BG | C-E |
| 150 | 65 | 125V/500V | 0.50 | TO-247 | ARF460AG/BG | A-E |
| | 65 | 250V/1kV | 0.50 | TO-247 | ARF461AG/BG | A-E |
| | 60 | 300V/1.2kV | 0.50 | TO-247 | ARF465AG/BG | A-E |
| 150 | 100 | 165V/500V | 0.70 | M174 | ARF520 | A-E |
| | 150 | 165V/500V | 0.60 | M174 | ARF521 | A-E |
| 300 | 150 | 165V/500V | 0.35 | M208 | ARF473 | A-E |
| | 150 | 165V/500V | 0.31 | T3A | ARF475FL | A-E |
| | 150 | 165V/500V | 0.31 | T3C | ARF476FL | A-E |
| 300 | 45 | 200V/1kV | 0.35 | TO-264 | ARF466AG/BG | A-E |
| | 45 | 200V/1kV | 0.27 | T2 | ARF466FL | A-E |
| | 45 | 200V/1kV | 0.27 | T2 | ARF467FL | A-E |
| 750 | 25 | 250V/1000V | 0.13 | T2 | ARF1519 | A-E |
| 750 | 40 | 125V/500V | 0.12 | T1 | ARF1500 | A-E |
| | 40 | 250V/1kV | 0.12 | T1 | ARF1501 | A-E |
| | 40 | 300V/1.2kV | 0.12 | T1 | ARF1505 | A-E |
| 750 | 40 | 400V/1000V | 0.12 | T1 | ARF1510 | D |
| | 40 | 380V/500V | 0.12 | T1 | ARF1511 | D |




## Drivers and Driver-RF MOSFET Hybrids

RF MOSFET performance can be severely limited by the driver selection. The DRF100 and DRF200G Drivers have been optimized to drive RF power MOSFETs. The DRF100 is able to drive RF MOSFETs with greater than 3nF gate capacitance to 15 volts at 30MHz. The DRF1200/01/02/03 Hybrids integrates Driver, bypass capacitors and RF MOSFETS into a single package. Integration maximizes amplifier performance by minimizing transmission line parasitics between the Driver and MOSFET. The DRF1300 or DRF1301 has two independent channels, each containing a Driver and RF MOSFET in a push pull configuration. The DRF1400A and B are half bridge hybrids with symmetrically orientated leads so that the two can easily be configured into a full bridge converter. All DRF parts feature a proprietary Anti-ring function to eliminate cross conduction in a Bridge or push-pull topologies. All DRF parts except the DRF200G (non-inverting only) can be externally selected in either an inverting or non-inverting configuration.

| Pout (W) | Freq. (MHz) | $V_{DD}/BV_{DSS}$ (V) | θJC (°C/W) | Package Style | Part Number | Class of Operation | Description |
|---|---|---|---|---|---|---|---|
| 50 | 50 | 15V/- | 1.40 | T3B | DRF100 | D-E | High Speed MOSFET Driver |
| 50 | 30 | 15V/- | 1.40 | TO-247 | DRF200G | D-E | MOSFET Driver |
| 560 | 30 | 15V/1000V | 1.00 | T2B | DRF1200 | D-E | Driver and High Voltage RF MOSFET |
| 2000 | 30 | 15V/1000V | .025 | T2B | DRF1201 | D-E | Driver and High Voltage/High Power RF MOSFET |
| 2000 | 30 | 15V/500V | .025 | T2B | DRF1202 | D-E | Driver and High Power RF MOSFET |
| 650 | 30 | 15V/1000V | 0.09 | T2B | DRF1203 | D-E | Driver and High Voltage RF MOSFET |
| 1500 | 30 | 15V/500V | 0.06 | T4 | DRF1300 | D-E | 2 Drivers/RF MOSFETs in Push-Pull Configuration |
| 1500 | 30 | 15V/1000 | 0.06 | T4 | DRF1301 | D-E | 2 Drivers/RF MOSFETs in Push-Pull Configuration |
| 2500 | 30 | 15V/500 | 0.06 | T4 | DRF1400A/B | D-E | 2 Drivers/RF MOSFETs in a H Bridge Configuration |

All Products RoHS Compliant

## High Frequency RF MOSFETs

The VRF family of RF MOSFETs are improved replacements for industry standard RF transistors. They provide improved ruggedness by increasing the $BV_{DSS}$ over 30% from the industry standard of 125 volts to 170V minimum. Low cost flangeless packages - Microsemi is dedicated to optimizing the performance, reducing cost and improving reliability. We will continue to offer a greater number of product offerings in the new reduced cost Flangeless packages.

| Pout Min (W) | Pin Max (W) | Gain Typ (dB) | η Typ (%) | $V_{DD}/BV_{DSS}$ (V) | Coss Type (pF) | VSWR Load | θJC (°C/W) | Case Style | Part Number |
|---|---|---|---|---|---|---|---|---|---|
| 150 | 15.00 | 10 | 45 | 28V/65V | 420 | 30:1 | 0.6 | M174 | VRF141 |
| 30 | 1.00 | 15 | 50 | 50V/165V | 35 | 30:1 | 1.5 | M113 | VRF148A |
| 150 | 15.00 | 10 | 50 | 50V/165V | 230 | 30:1 | 0.6 | M174 | VRF150 |
| 150 | 6.00 | 14 | 50 | 50V/165V | 235 | 30:1 | 0.6 | M174 | VRF151 |
| 300 | 6.00 | 14 | 55 | 50V/165V | 220 | 5:1 | 0.35 | M208 | VRF151G |
| 600 | 16.00 | 17 | 45 | 50V/165V | 1000 | - | 0.13 | T2 | VRF154FL |
| 600 | 16.00 | 21 | 45 | 50V/165V | 750 | - | 0.13 | T2 | VRF157FL |
| 300 | 2.70 | 20 | 65 | 50V/165V | 370 | 3:1 | 0.27 | M177 | VRF2933 |

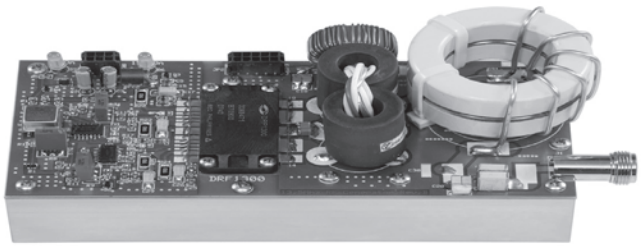
## Reference Design Kits

DRF1200/CLASS-E

The DRF1200/CLASS-E Single Ended RF Generator is a reference design providing the designer the ability to evaluate an 85% efficient 1000W CLASS-E RF Generator

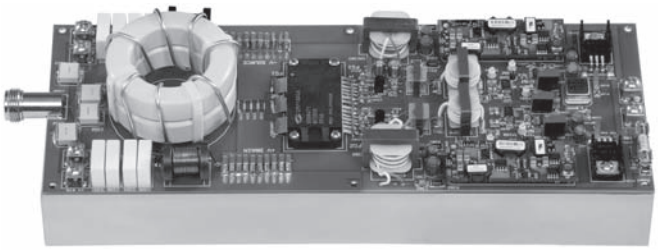
DRF1300/CLASS-D

The DRF1300/CLASS-D Push Pull RF Generator is a reference design providing the designer the ability to evaluate an 80% efficient 2000W CLASS-D RF Generator



DRF1400/CLASS-D

The DRF1400/CLASS-D Half Bridge RF Generator is a reference design providing the designer the ability to evaluate an 86% efficient 3000W CLASS- D RF Generator



All kits include: A fully populated board attached to an aluminum heat sink. An extensive application note explaining the theory of operation with desginers recommendations for evaluation and board layout. All key waveforms are illustrated and described. A complete parts list with recommended vendor part numbers and the board's Gerber file are provided for an easy transition into an end application.

# POWER MODULES

Microsemi combines a formidable array of technologies in semiconductors, packaging, and automated manufacturing to produce a wide range of high quality modules optimized for:

- Reliability
- Efficiency and electrical performance
- Low cost
- Space savings
- Reduced assembly time

The readily available standard module product line spans a wide selection of circuit topologies, semiconductors including silicon carbide, voltage and current ratings, and packages. If you need even more flexibility or intellectual property protection, Microsemi can often customize a standard power module with no setup cost and with a short lead time. Unique requirements can be met with Application Specific Power Modules (ASPM®).

In addition to industrial, UPS, SMPS, and motor drive applications, Microsemi serves Hi-Rel applications. A wide selection of construction materials enables Microsemi to manufacture with short lead times modules that feature:

- Extended temperature range: -60°C to +200°C
- Reduced size and weight
- Extended reliability
- Hi-Rel testing and screening options

Microsemi's experience and expertise in power electronic conversion brings the most effective technical support for your new development. Here is how we can help with your application:

- Isolated gate driver & supply
- Short circuit protection
- Snubbers
- Temperature & current sensing
- Mix & match semiconductors
- Parameter binning

## Power Module Part Numbering System

### IGBT Modules

| APT | G = IGBT module | Speed | Current @ Tc=80°C | Circuit | Voltage | Suffix |
|---|---|---|---|---|---|---|
| | | S Low Loss IGBT<br>F Fast IGBT<br>U Ultra Fast IGBT<br>T Trench Gate IGBT | X 1 | A Phase Leg<br>H Full Bridge<br>U Single Switch<br>X 3 Phase Inverter<br>DH Asymmetric Bridge<br>DA Boost Chopper<br>SK Buck Chopper<br>DDA Double Boost Chopper<br>DSK Double Buck Chopper<br>DU Dual Common Source<br>TA Triple Phase Leg<br>TDU Triple Dual Common Source | / 10 | A AlN substrate<br>B Rectif Bridge & Brake Switch<br>D Series Diode<br>G ROHS Compliant<br>M AlSiC Base Plate<br>R Rectifier Bridge<br>T NTC<br>W Clamping freewheeling diode only<br><br>1 SP1 package<br>3 For SP3 package<br>6 For SP6 if redundancy with SP4 P/N<br>P SP6 with solderable pins<br><br>D1 34mm package<br>D3 62mm package<br>D4 62mm package<br>E2 Econo type package<br>E3 Econo type package<br>P2 Econo type package<br>P3 Econo type package |

**APT G F 300 U 120 DAG**

### MOSFET Modules

| APT | M = MOSFET module<br>C = CoolMOS™ module | Voltage | Circuit | Rdson | Suffix |
|---|---|---|---|---|---|
| | | / 10 | A Phase Leg<br>H Full Bridge<br>U Single Switch<br>X 3 Phase Inverter<br>DH Asymmetric Bridge<br>DA Boost Chopper<br>SK Buck Chopper<br>DDA Double Boost Chopper<br>DSK Double Buck Chopper<br>DU Dual Common Source<br>TA Triple Phase Leg<br>TDU Triple Dual Common Source | if>100 : / 10<br>if<100 : M value | A AlN substrate<br>B Rectif Bridge & Brake Switch<br>C SiC diodes<br>D Series Diode<br>F FREDFET<br>G ROHS Compliant<br>M AlSiC Base plate<br>R Rectif Bridge<br>S Series and Parallel diodes<br>T NTC<br><br>1 SP1 package<br>3 For SP3 package<br>6 For SP6 if redundancy with SP4 P/N<br>P SP6 with solderable pins<br><br>D1 34mm package<br>D3 62mm package<br>D4 62mm package<br>E2 Econo type package<br>E3 Econo type package<br>P2 Econo type package<br>P3 Econo type package |

**APT C 60 A M18 SCTG**

CoolMOS™ is a trademark of Infineon Technologies

### Diode Modules

| APT | D= Diode module | Type | Current | Circuit | Voltage | Suffix |
|---|---|---|---|---|---|---|
| | | C SiC<br>F FRED<br>SK Schottky<br>R Standard Rectifier | X 1 | U Single<br>H Bridge<br>DH Dual Bridge<br>AA Dual Common Anode<br>KK Dual Common Cathode<br>AK Dual Diodes<br>X Three Phase Bridge Rectifier | / 10 | G ROHS Compliant |

**APT D F 400 AK 60 G**

# POWER MODULE PACKAGES

**Microsemi's** power module packages cover a complete line of industry standard packages as well as new low profile packages featuring lower cost, less stray inductance, and lower parasitic resistance for higher efficiency, higher frequency capability, and lower EMI.

- Lower cost
- Reduced stray inductance
- Reduced parasitic resistance
- Higher efficiency
- Higher frequency capability
- Lower EMI

## Improved Low Profile Packages

**SP1** (12mm)
**SP3** (12mm)
**SP4** (17mm)
**SP6** (17mm)
**SP6-P** (12mm)


SP1

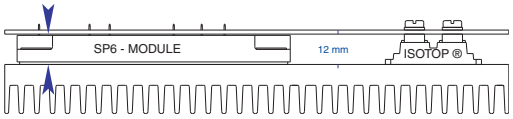

SP3


SP4


SP6


SP6-P

## Package Advantages




SP1 package:
-Replaces 2 SOT-227 parts
-Improved assembly time and cost
-Height compatible with SOT-227 package
-Copper base plate for improved performance

SP6 package offers the same footprint and the same pinout location as the popular 62mm package but with lower height, leading to:
- Reduced stray inductance
- Reduced parasitic resistance
- Higher efficiency at high frequency

SP3 package:
-Replaces up to 4 SOT-227 parts
-Reduced assembly time and cost
-Height compatible with SOT-227 package
-Copper base plate for high reliability

SP6-P package:
-Replaces up to 6 SOT-227 parts
-Height compatible with SOT-227 package
-Low inductance solder pins
-High current capability

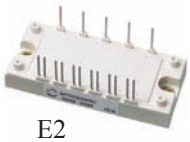
## Industry Standard Packages

SOT-227 (Isotop®)


SOT-227

Econo Types

E2 (Long Pins)
P2 (Short Pins)
E3 & P3 (Short Pins Only)


E2


P2


E3/P3

34mm & 62mm Types

D1 (34 mm Wide)
D3 (62 mm Wide)
D4 (62 mm Wide)

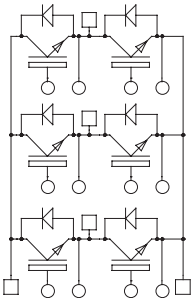

D1


D3


D4

# IGBT Power Modules

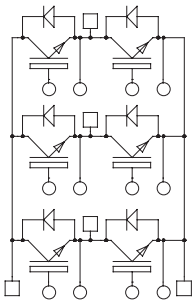
## 3 PHASE BRIDGE (SP3 package)



| $V_{CES}$ (V) | IGBT Type | $I_C$(A) $T_C$=80° C | $V_{CE(ON)}$ at rated Ic | Package Style | NTC | Part Number |
|---|---|---|---|---|---|---|
| 600 | NPT | 30 | 2.1 | SP3 | YES | APTGF30X60T3G |
| | | 50 | 2.1 | SP3 | YES | APTGF50X60T3G |
| | TRENCH | 20 | 1.5 | SP3 | YES | APTGT20X60T3G |
| | | 30 | 1.5 | SP3 | YES | APTGT30X60T3G |
| | | 50 | 1.5 | SP3 | YES | APTGT50X60T3G |
| | | 75 | 1.5 | SP3 | YES | APTGT75X60T3G |
| 1200 | NPT | 15 | 3.2 | SP3 | YES | APTGF15X120T3G |
| | | 25 | 3.2 | SP3 | YES | APTGF25X120T3G |
| | TRENCH | 25 | 1.7 | SP3 | YES | APTGT25X120T3G |
| | | 35 | 1.7 | SP3 | YES | APTGT35X120T3G |

SP3

## 3 PHASE BRIDGE (long pin package)

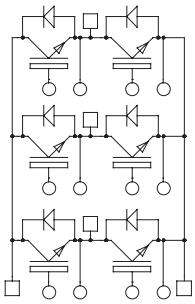


| $V_{CES}$ (V) | IGBT Type | $I_C$(A) $T_C$=80° C | $V_{CE(ON)}$ at rated Ic | Package Style | NTC | Part Number |
|---|---|---|---|---|---|---|
| 600 | NPT | 20 | 2.1 | E2 | - | APTGF20X60E2G |
| | | 30 | 2.1 | E2 | - | APTGF30X60E2G |
| | | 50 | 2.1 | E2 | - | APTGF50X60E2G |
| 1200 | NPT | 10 | 3.2 | E2 | - | APTGF10X120E2G |
| | | 15 | 3.2 | E2 | - | APTGF15X120E2G |
| | | 25 | 3.2 | E2 | - | APTGF25X120E2G |
| | | 50 | 3.2 | E2 | - | APTGF50X120E2G |
| 1700 | NPT | 50 | 3.2 | E2 | - | APTGS50X170E2G |

E2

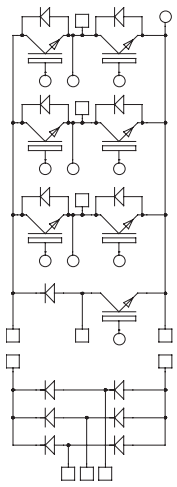
P2

## 3 PHASE BRIDGE (short pin package)



| $V_{CES}$ (V) | IGBT Type | $I_C$(A) $T_C$=80° C | $V_{CE(ON)}$ at rated Ic | Package Style | NTC | Part Number |
|---|---|---|---|---|---|---|
| 600 | NPT | 50 | 2.1 | P2 | - | APTGF50X60P2G |
| | | 90 | 2.1 | E3 | YES | APTGF90X60TE3G |
| | | 150 | 2.1 | E3 | - | APTGF150X60E3G |
| | | 150 | 2.1 | E3 | YES | APTGF150X60TE3G |
| 1200 | NPT | 25 | 3.2 | P2 | - | APTGF25X120P2G |
| | | 50 | 3.2 | P2 | - | APTGF50X120P2G |
| | | 50 | 3.2 | E3 | YES | APTGF50X120TE3G |
| | Field Stop Trench | 75 | 1.7 | E3 | - | APTGT75X120E3G |
| | | 75 | 1.7 | E3 | YES | APTGT75X120TE3G |
| | | 100 | 1.7 | E3 | - | APTGT100X120E3G |
| | | 100 | 1.7 | E3 | YES | APTGT100X120TE3G |
| | | 150 | 1.7 | E3 | - | APTGT150X120E3G |
| 1700 | NPT | 75 | 3.5 | E3 | YES | APTGS75X170TE3G |

E3/P3

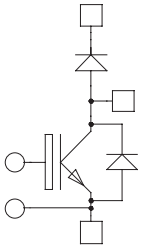


## 3 PHASE BRIDGE + RECTIFIER

| $V_{CES}$ (V) | IGBT Type | $I_C$(A) $T_C$=80° C | $V_{CE(ON)}$ at rated Ic | Package Style | NTC | Part Number |
|---|---|---|---|---|---|---|
| 600 | NPT | 50 | 2.1 | P3 | YES | APTGF50X60RTP3G |
| | | 50 | 2.1 | P3 | YES | APTGF50X60BTP3G |
| 1200 | NPT | 25 | 2.5 | P2 | YES | APTGS25X120RTP2G |
| | | 25 | 2.5 | P2 | YES | APTGS25X120BTP2G |
| | Field Stop Trench | 35 | 1.7 | P3 | YES | APTGT35X120RTP3G |
| | | 35 | 1.7 | P3 | YES | APTGT35X120BTP3G |
| | | 50 | 1.7 | P3 | YES | APTGT50X120RTP3G |
| | | 75 | 1.7 | P3 | YES | APTGT75X120BTP3G |
| 1700 | Trench | 50 | 2.0 | P3 | YES | APTGT50X170BTP3G |

All Power Modules RoHS Compliant

## BOOST CHOPPER



| $V_{CES}$ (V) | IGBT Type | $I_C$(A) $T_C$=80° C | $V_{CE(ON)}$ at rated Ic | Package Style | NTC | Part Number |
|---|---|---|---|---|---|---|
| 600 | NPT | 30 | 2.1 | ISOTOP® | - | APT30GF60JU2 |
| | | 50 | 2.1 | ISOTOP® | - | APT50GF60JU2 |
| | | 60 | 2.1 | ISOTOP® | - | APT60GF60JU2 |
| | | 75 | 2.1 | D1 | - | APTGF75DA60D1G |
| | | 90 | 2.1 | SP1 | YES | APTGF90DA60T1G |
| | | 90 | 2.1 | SP4 | YES | APTGF90DA60TG |
| | | 100 | 2.1 | ISOTOP® | - | APT100GF60JU2 |
| | | 165 | 2.0 | D1 | - | APTGF165DA60D1G |
| | | 180 | 2.1 | SP4 | YES | APTGF180DA60TG |
| | | 330 | 2.0 | D3 | - | APTGF330DA60D3G |
| | | 350 | 2.1 | SP6 | - | APTGF350DA60G |
| | Field Stop Trench | 75 | 1.5 | SP1 | YES | APTGT75DA60T1G |
| | | 100 | 1.5 | SP1 | YES | APTGT100DA60T1G |
| | | 100 | 1.5 | SP4 | YES | APTGT100DA60TG |
| | | 150 | 1.5 | SP1 | YES | APTGT150DA60T1G |
| | | 150 | 1.5 | SP4 | YES | APTGT150DA60TG |
| | | 200 | 1.5 | SP4 | YES | APTGT200DA60TG |
| | | 300 | 1.4 | SP6 | - | APTGT300DA60G |
| | | 450 | 1.4 | SP6 | - | APTGT450DA60G |
| | | 600 | 1.4 | SP6 | - | APTGT600DA60G |
| 1200 | NPT | 50 | 3.2 | SP1 | YES | APTGF50DA120T1G |
| | | 50 | 3.2 | SP4 | YES | APTGF50DA120TG |
| | | 75 | 3.2 | SP1 | YES | APTGF75DA120T1G |
| | | 100 | 3.2 | SP1 | YES | APTGF100DA120T1G |
| | | 100 | 3.2 | SP4 | YES | APTGF100DA120TG |
| | | 150 | 3.2 | SP4 | YES | APTGF150DA120TG |
| | | 300 | 3.2 | SP6 | - | APTGF300DA120G |
| | Field Stop Trench | 35 | 1.7 | ISOTOP® | - | APT35GT120JU2 |
| | | 50 | 1.7 | ISOTOP® | - | APT50GT120JU2 |
| | | 50 | 1.7 | D1 | - | APTGT50DA120D1G |
| | | 50 | 1.7 | SP4 | YES | APTGT50DA120TG |
| | | 75 | 1.7 | ISOTOP® | - | APT75GT120JU2 |
| | | 75 | 1.7 | SP1 | YES | APTGT75DA120T1G |
| | | 75 | 1.7 | SP4 | YES | APTGT75DA120TG |
| | | 100 | 1.7 | SP1 | YES | APTGT100DA120T1G |
| | | 100 | 1.7 | ISOTOP® | - | APT100GT120JU2 |
| | | 100 | 1.7 | D1 | - | APTGT100DA120D1G |
| | | 100 | 1.7 | SP4 | YES | APTGT100DA120TG |
| | | 150 | 1.7 | SP6 | - | APTGT150DA120G |
| | | 150 | 1.7 | D1 | - | APTGT150DA120D1G |
| | | 150 | 1.7 | SP4 | YES | APTGT150DA120TG |
| | | 200 | 1.7 | SP6 | - | APTGT200DA120G |
| | | 200 | 1.7 | D3 | - | APTGT200DA120D3G |
| | | 300 | 1.7 | SP6 | - | APTGT300DA120G |
| | | 300 | 1.7 | D3 | - | APTGT300DA120D3G |
| | | 400 | 1.7 | SP6 | - | APTGT400DA120G |
| 1700 | Field Stop Trench | 30 | 2.0 | SP1 | YES | APTGT30DA170T1G |
| | | 50 | 2.0 | SP1 | YES | APTGT50DA170T1G |
| | | 50 | 2.0 | SP4 | YES | APTGT50DA170TG |
| | | 75 | 2.0 | SP1 | YES | APTGT75DA170T1G |
| | | 75 | 2.0 | D1 | - | APTGT75DA170D1G |
| | | 100 | 2.0 | D1 | - | APTGT100DA170D1G |
| | | 100 | 2.0 | SP4 | YES | APTGT100DA170TG |
| | | 150 | 2.0 | SP6 | - | APTGT150DA170G |
| | | 150 | 2.0 | D3 | - | APTGT150DA170D3G |
| | | 225 | 2.0 | SP6 | - | APTGT225DA170G |
| | | 300 | 2.0 | SP6 | - | APTGT300DA170G |


D1


D3


SOT-227

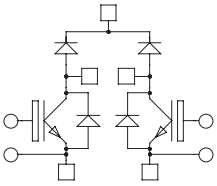

SP1


SP3


SP4


SP6

## DUAL BOOST CHOPPER

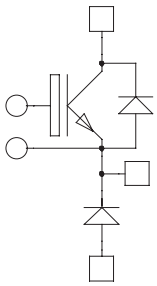


| $V_{CES}$ (V) | IGBT Type | $I_C$(A) $T_C$=80° C | $V_{CE(ON)}$ at rated Ic | Package Style | NTC | Part Number |
|---|---|---|---|---|---|---|
| 600 | NPT | 50 | 2.1 | SP3 | YES | APTGF50DDA60T3G |
| | Field Stop Trench | 20 | 1.5 | SP3 | YES | APTGT20DDA60T3G |
| | | 30 | 1.5 | SP3 | YES | APTGT30DDA60T3G |
| | | 50 | 1.5 | SP3 | YES | APTGT50DDA60T3G |
| | | 75 | 1.5 | SP3 | YES | APTGT75DDA60T3G |
| | | 100 | 1.5 | SP3 | YES | APTGT100DDA60T3G |
| 1200 | NPT | 25 | 3.2 | SP3 | YES | APTGF25DDA120T3G |
| | | 75 | 3.2 | SP4 | YES | APTGF75DDA120TG |
| | Field Stop | 50 | 1.7 | SP3 | YES | APTGT50DDA120T3G |

All Power Modules RoHS Compliant

# IGBT Power Modules

## BUCK CHOPPER



| $V_{CES}$ (V) | IGBT Type | $I_C$(A) $T_C$=80° C | $V_{CE(ON)}$ at rated Ic | Package Style | NTC | Part Number |
|---|---|---|---|---|---|---|
| 600 | NPT | 30 | 2.1 | ISOTOP® | - | APT30GF60JU3 |
| | | 50 | 2.1 | ISOTOP® | - | APT50GF60JU3 |
| | | 60 | 2.1 | ISOTOP® | - | APT60GF60JU3 |
| | | 90 | 2.1 | SP1 | YES | APTGF90SK60T1G |
| | | 90 | 2.1 | SP4 | YES | APTGF90SK60TG |
| | | 100 | 2.1 | ISOTOP® | - | APT100GF60JU3 |
| | | 165 | 2.0 | D1 | - | APTGF165SK60D1G |
| | | 180 | 2.1 | SP4 | YES | APTGF180SK60TG |
| | | 350 | 2.1 | SP6 | - | APTGF350SK60G |
| | Field Stop Trench | 75 | 1.5 | SP1 | YES | APTGT75SK60T1G |
| | | 100 | 1.5 | SP1 | YES | APTGT100SK60T1G |
| | | 100 | 1.5 | SP4 | YES | APTGT100SK60TG |
| | | 150 | 1.5 | SP1 | YES | APTGT150SK60T1G |
| | | 150 | 1.5 | SP4 | YES | APTGT150SK60TG |
| | | 200 | 1.5 | SP4 | YES | APTGT200SK60TG |
| | | 300 | 1.4 | SP6 | - | APTGT300SK60G |
| | | 450 | 1.4 | SP6 | - | APTGT450SK60G |
| | | 600 | 1.4 | SP6 | - | APTGT600SK60G |
| 1200 | NPT | 50 | 3.2 | SP1 | YES | APTGF50SK120T1G |
| | | 50 | 3.2 | SP4 | YES | APTGF50SK120TG |
| | | 100 | 3.2 | SP4 | YES | APTGF100SK120TG |
| | | 150 | 3.2 | SP4 | YES | APTGF150SK120TG |
| | | 300 | 3.2 | SP6 | - | APTGF300SK120G |
| | Field Stop Trench | 35 | 1.7 | ISOTOP® | - | APT35GT120JU3 |
| | | 50 | 1.7 | ISOTOP® | - | APT50GT120JU3 |
| | | 50 | 1.7 | SP4 | YES | APTGT50SK120TG |
| | | 75 | 1.7 | SP1 | YES | APTGT75SK120T1G |
| | | 75 | 1.7 | SP4 | YES | APTGT75SK120TG |
| | | 75 | 1.7 | ISOTOP® | - | APT75GT120JU3 |
| | | 100 | 1.7 | ISOTOP® | - | APT100GT120JU3 |
| | | 100 | 1.7 | SP4 | YES | APTGT100SK120TG |
| | | 150 | 1.7 | SP6 | - | APTGT150SK120G |
| | | 150 | 1.7 | SP4 | YES | APTGT150SK120TG |
| | | 200 | 1.7 | SP6 | - | APTGT200SK120G |
| | | 200 | 1.7 | D3 | - | APTGT200SK120D3G |
| | | 300 | 1.7 | SP6 | - | APTGT300SK120G |
| | | 400 | 1.7 | SP6 | - | APTGT400SK120G |
| 1700 | Field Stop Trench | 30 | 2.0 | SP1 | YES | APTGT30SK170T1G |
| | | 50 | 2.0 | SP1 | YES | APTGT50SK170T1G |
| | | 50 | 2.0 | SP4 | YES | APTGT50SK170TG |
| | | 100 | 2.0 | SP4 | YES | APTGT100SK170TG |
| | | 150 | 2.0 | SP6 | - | APTGT150SK170G |
| | | 225 | 2.0 | SP6 | - | APTGT225SK170G |
| | | 300 | 2.0 | SP6 | - | APTGT300SK170G |
| | | 300 | 2.0 | D3 | - | APTGT300SK170D3G |

D1

D3

SOT-227

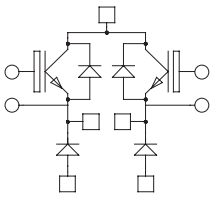
SP1

SP3

SP4

SP6

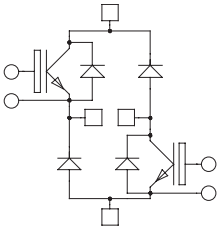
## DUAL BUCK CHOPPER



| $V_{CES}$ (V) | IGBT Type | $I_C$(A) $T_C$=80° C | $V_{CE(ON)}$ at rated Ic | Package Style | NTC | Part Number |
|---|---|---|---|---|---|---|
| 600 | NPT | 50 | 2.1 | SP3 | YES | APTGF50DSK60T3G |
| | Field Stop Trench | 20 | 1.5 | SP3 | YES | APTGT20DSK60T3G |
| | | 30 | 1.5 | SP3 | YES | APTGT30DSK60T3G |
| | | 50 | 1.5 | SP3 | YES | APTGT50DSK60T3G |
| | | 75 | 1.5 | SP3 | YES | APTGT75DSK60T3G |
| | | 100 | 1.5 | SP3 | YES | APTGT100DSK60T3G |
| 1200 | NPT | 25 | 3.2 | SP3 | YES | APTGF25DSK120T3G |
| | | 75 | 3.2 | SP4 | YES | APTGF75DSK120TG |
| | Field Stop | 50 | 1.7 | SP3 | YES | APTGT50DSK120T3G |

All Power Modules RoHS Compliant

## ASYMMETRICAL BRIDGE

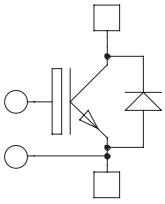


| $V_{CES}$ (V) | IGBT Type | $I_C$(A) $T_C$=80°C | $V_{CE(ON)}$ at rated Ic | Package Style | NTC | Part Number |
|---|---|---|---|---|---|---|
| 600 | NPT | 50 | 2.1 | SP4 | YES | APTGF50DH60TG |
| | | 90 | 2.1 | SP4 | YES | APTGF90DH60TG |
| | | 180 | 2.1 | SP6 | - | APTGF180DH60G |
| | Field Stop Trench | 50 | 1.5 | SP4 | YES | APTGT50DH60TG |
| | | 75 | 1.5 | SP4 | YES | APTGT75DH60TG |
| | | 100 | 1.5 | SP4 | YES | APTGT100DH60TG |
| | | 150 | 1.5 | SP4 | YES | APTGT150DH60TG |
| | | 200 | 1.5 | SP6 | - | APTGT200DH60G |
| | | 300 | 1.4 | SP6 | - | APTGT300DH60G |
| 1200 | NPT | 50 | 3.2 | SP4 | YES | APTGF50DH120TG |
| | | 75 | 3.2 | SP4 | YES | APTGF75DH120TG |
| | | 150 | 3.2 | SP6 | - | APTGF150DH120G |
| | Field Stop Trench | 50 | 1.7 | SP4 | YES | APTGT50DH120TG |
| | | 75 | 1.7 | SP4 | YES | APTGT75DH120TG |
| | | 100 | 1.7 | SP4 | YES | APTGT100DH120TG |
| | | 150 | 1.7 | SP6 | - | APTGT150DH120G |
| | | 200 | 1.7 | SP6 | - | APTGT200DH120G |
| 1700 | Field Stop Trench | 50 | 2.0 | SP4 | YES | APTGT50DH170TG |
| | | 100 | 2.0 | SP6 | - | APTGT100DH170G |
| | | 150 | 2.0 | SP6 | - | APTGT150DH170G |

D4

SP4

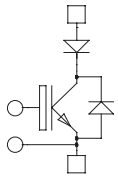
## SINGLE SWITCH



| $V_{CES}$ (V) | IGBT Type | $I_C$(A) $T_C$=80°C | $V_{CE(ON)}$ at rated Ic | Package Style | NTC | Part Number |
|---|---|---|---|---|---|---|
| 600 | NPT | 200 | 2.1 | D4 | - | APTGF200U60D4G |
| | | 300 | 2.1 | D4 | - | APTGF300U60D4G |
| | | 360 | 2.0 | D4 | - | APTGF360U60D4G |
| | | 500 | 2.0 | D4 | - | APTGF500U60D4G |
| | | 660 | 2.0 | D4 | - | APTGF660U60D4G |
| 1200 | Field Stop Trench | 200 | 1.7 | D4 | - | APTGT200U120D4G |
| | | 300 | 1.7 | D4 | - | APTGT300U120D4G |
| | | 400 | 1.7 | D4 | - | APTGT400U120D4G |
| | | 600 | 1.7 | D4 | - | APTGT600U120D4G |
| 1700 | Field Stop Trench | 200 | 2.0 | D4 | - | APTGT200U170D4G |
| | | 300 | 2.0 | D4 | - | APTGT300U170D4G |
| | | 400 | 2.0 | D4 | - | APTGT400U170D4G |
| | | 600 | 2.0 | D4 | - | APTGT600U170D4G |

SP6

## SINGLE SWITCH + SERIES DIODE

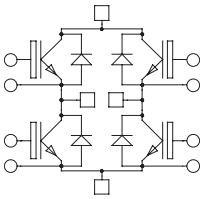


| $V_{CES}$ (V) | IGBT Type | $I_C$(A) $T_C$=80°C | $V_{CE(ON)}$ at rated Ic | Package Style | NTC | Part Number |
|---|---|---|---|---|---|---|
| 1200 | NPT | 200 | 3.2 | SP6 | - | APTGF200U120DG |
| | | 300 | 3.2 | SP6 | - | APTGF300U120DG |

All Power Modules RoHS Compliant

# IGBT Power Modules

## FULL BRIDGE



| $V_{CES}$ (V) | IGBT Type | $I_C$(A) $T_C$=80°C | $V_{CE(ON)}$ at rated Ic | Package Style | NTC | Part Number |
|---|---|---|---|---|---|---|
| 600 | NPT | 30 | 2.1 | SP1 | YES | APTGF30H60T1G |
| | | 30 | 2.1 | SP3 | YES | APTGF30H60T3G |
| | | 50 | 2.1 | SP1 | YES | APTGF50H60T1G |
| | | 50 | 2.1 | SP3 | YES | APTGF50H60T3G |
| | | 90 | 2.1 | SP4 | YES | APTGF90H60TG |
| | | 180 | 2.1 | SP6 | - | APTGF180H60G |
| | Field Stop Trench | 20 | 1.5 | SP1 | YES | APTGT20H60T1G |
| | | 20 | 1.5 | SP3 | YES | APTGT20H60T3G |
| | | 30 | 1.5 | SP1 | YES | APTGT30H60T1G |
| | | 30 | 1.5 | SP3 | YES | APTGT30H60T3G |
| | | 50 | 1.5 | SP1 | YES | APTGT50H60T1G |
| | | 50 | 1.5 | SP3 | YES | APTGT50H60T3G |
| | | 75 | 1.5 | SP1 | YES | APTGT75H60T1G |
| | | 75 | 1.5 | SP3 | YES | APTGT75H60T3G |
| | | 100 | 1.5 | SP4 | YES | APTGT100H60TG |
| | | 100 | 1.5 | SP3 | YES | APTGT100H60T3G |
| | | 150 | 1.5 | SP4 | YES | APTGT150H60TG |
| | | 200 | 1.5 | SP6 | - | APTGT200H60G |
| | | 300 | 1.4 | SP6 | - | APTGT300H60G |
| 1200 | NPT | 15 | 3.2 | SP1 | YES | APTGF15H120T1G |
| | | 15 | 3.2 | SP3 | YES | APTGF15H120T3G |
| | | 25 | 3.2 | SP1 | YES | APTGF25H120T1G |
| | | 25 | 3.2 | SP3 | YES | APTGF25H120T3G |
| | | 50 | 3.2 | SP4 | YES | APTGF50H120TG |
| | | 75 | 3.2 | SP4 | YES | APTGF75H120TG |
| | | 150 | 3.2 | SP6 | - | APTGF150H120G |
| | Field Stop Trench | 25 | 1.7 | SP1 | YES | APTGT25H120T1G |
| | | 35 | 1.7 | SP1 | YES | APTGT35H120T1G |
| | | 35 | 1.7 | SP3 | YES | APTGT35H120T3G |
| | | 50 | 1.7 | SP4 | YES | APTGT50H120TG |
| | | 50 | 1.7 | SP3 | YES | APTGT50H120T3G |
| | | 75 | 1.7 | SP4 | YES | APTGT75H120TG |
| | | 100 | 1.7 | SP6 | - | APTGT100H120G |
| | | 150 | 1.7 | SP6 | - | APTGT150H120G |
| | | 200 | 1.7 | SP6 | - | APTGT200H120G |
| 1700 | Field Stop Trench | 30 | 2.0 | SP3 | YES | APTGT30H170T3G |
| | | 50 | 2.0 | SP4 | YES | APTGT50H170TG |
| | | 100 | 2.0 | SP6 | - | APTGT100H170G |
| | | 150 | 2.0 | SP6 | - | APTGT150H170G |

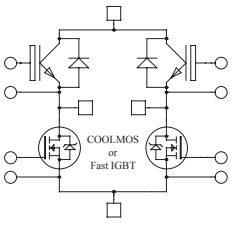
SP1

SP3

SP4

SP6

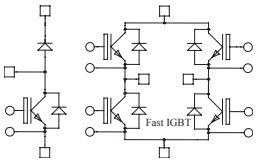
## FULL BRIDGE




| $V_{CES}$ (V) | Technology | $I_C$(A) $T_C$=80°C | $V_{CE(ON)}$ at rated Ic | Package Style | NTC | Part Number |
|---|---|---|---|---|---|---|
| 600 | DC/AC Inverter (NPT/Trench IGBT) | 30 | 2.1/1.5 | SP3 | YES | APTGV30H60T3G |
| | | 50 | 2.1/1.5 | SP3 | YES | APTGV50H60T3G |
| | | 75 | 2.1/1.5 | SP3 | YES | APTGV75H60T3G |
| | | 100 | 2.1/1.5 | SP3 | YES | APTGV100H60T3G |
| | DC/AC Inverter (COOLMOS/TRENCH) | 50 | 83mR/1.5 | SP1 | YES | APTCV40H60CT1G |
| | | 50 | 45mR/1.5 | SP3 | YES | APTCV50H60T3G |
| 1200 | DC/AC Inverter (NPT/Trench IGBT) | 15 | 3.2/1.7 | SP3 | YES | APTGV15H120T3G |
| | | 25 | 3.2/1.7 | SP3 | YES | APTGV25H120T3G |
| | | 50 | 3.2/1.7 | SP3 | YES | APTGV50H120T3G |

SP6-P

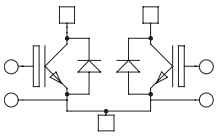
## BOOST CHOPPER + FULL BRIDGE




| $V_{CES}$ (V) | Technology | $I_C$(A) $T_C$=80°C | $V_{CE(ON)}$ at rated Ic | Package Style | NTC | Part Number |
|---|---|---|---|---|---|---|
| 600 | DC/AC Inverter (NPT/Trench IGBT) | 50 | 2.1/1.5 | SP4 | - | APTGV50H60BG |
| | | 100 | 2.1/1.5 | SP6-P | YES | APTGV100H60BTPG |
| 1200 | DC/AC Inverter (NPT/Trench IGBT) | 25 | 3.2/1.7 | SP4 | - | APTGV25H120BG |
| | | 50 | 3.2/1.7 | SP6-P | YES | APTGV50H120BTPG |

All Power Modules RoHS Compliant

## DUAL COMMON SOURCE



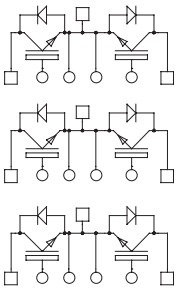
| $V_{CES}$ (V) | IGBT Type | $I_C$(A) $T_C$=80°C | $V_{CE(ON)}$ at rated Ic | Package Style | NTC | Part Number |
|---|---|---|---|---|---|---|
| 600 | NPT | 90 | 2.1 | SP4 | YES | APTGF90DU60TG |
| | | 180 | 2.1 | SP4 | YES | APTGF180DU60TG |
| | | 350 | 2.1 | SP6 | - | APTGF350DU60G |
| | Field Stop Trench | 100 | 1.5 | SP4 | YES | APTGT100DU60TG |
| | | 150 | 1.5 | SP4 | YES | APTGT150DU60TG |
| | | 200 | 1.5 | SP4 | YES | APTGT200DU60TG |
| | | 300 | 1.4 | SP6 | - | APTGT300DU60G |
| | | 450 | 1.4 | SP6 | - | APTGT450DU60G |
| | | 600 | 1.4 | SP6 | - | APTGT600DU60G |
| 1200 | NPT | 50 | 3.2 | SP4 | YES | APTGF50DU120TG |
| | | 100 | 3.2 | SP4 | YES | APTGF100DU120TG |
| | | 150 | 3.2 | SP4 | YES | APTGF150DU120TG |
| | | 300 | 3.2 | SP6 | - | APTGF300DU120G |
| | Field Stop Trench | 50 | 1.7 | SP4 | YES | APTGT50DU120TG |
| | | 75 | 1.7 | SP4 | YES | APTGT75DU120TG |
| | | 100 | 1.7 | SP4 | YES | APTGT100DU120TG |
| | | 150 | 1.7 | SP6 | - | APTGT150DU120G |
| | | 150 | 1.7 | SP4 | YES | APTGT150DU120TG |
| | | 200 | 1.7 | SP6 | - | APTGT200DU120G |
| | | 300 | 1.7 | SP6 | - | APTGT300DU120G |
| | | 400 | 1.7 | SP6 | - | APTGT400DU120G |
| 1700 | Field Stop Trench | 50 | 2.0 | SP4 | YES | APTGT50DU170TG |
| | | 100 | 2.0 | SP4 | YES | APTGT100DU170TG |
| | | 150 | 2.0 | SP6 | - | APTGT150DU170G |
| | | 225 | 2.0 | SP6 | - | APTGT225DU170G |
| | | 300 | 2.0 | SP6 | - | APTGT300DU170G |

SP4

SP6

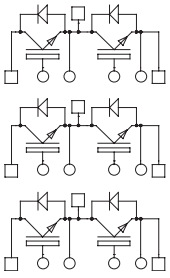
SP6-P

## TRIPLE DUAL COMMON SOURCE



| $V_{CES}$ (V) | IGBT Type | $I_C$(A) $T_C$=80°C | $V_{CE(ON)}$ at rated Ic | Package Style | NTC | Part Number |
|---|---|---|---|---|---|---|
| 600 | NPT | 90 | 2.1 | SP6-P | - | APTGF90TDU60PG |
| | Field Stop Trench | 50 | 1.5 | SP6-P | - | APTGT50TDU60PG |
| | | 75 | 1.5 | SP6-P | - | APTGT75TDU60PG |
| | | 100 | 1.5 | SP6-P | - | APTGT100TDU60PG |
| | | 150 | 1.5 | SP6-P | - | APTGT150TDU60PG |
| 1200 | NPT | 50 | 3.2 | SP6-P | - | APTGF50TDU120PG |
| | Field Stop | 75 | 1.7 | SP6-P | - | APTGT75TDU120PG |
| 1700 | Field Stop | 50 | 2.0 | SP6-P | - | APTGT50TDU170PG |

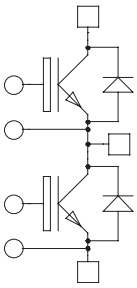
## TRIPLE PHASE LEG



| $V_{CES}$ (V) | IGBT Type | $I_C$(A) $T_C$=80°C | $V_{CE(ON)}$ at rated Ic | Package Style | NTC | Part Number |
|---|---|---|---|---|---|---|
| 600 | NPT | 90 | 2.1 | SP6-P | - | APTGF90TA60PG |
| | Field Stop Trench | 50 | 1.5 | SP6-P | - | APTGT50TA60PG |
| | | 75 | 1.5 | SP6-P | - | APTGT75TA60PG |
| | | 100 | 1.5 | SP6-P | - | APTGT100TA60PG |
| | | 150 | 1.5 | SP6-P | - | APTGT150TA60PG |
| 1200 | NPT | 50 | 3.2 | SP6-P | - | APTGF50TA120PG |
| | Field Stop | 75 | 1.7 | SP6-P | - | APTGT75TA120PG |
| 1700 | Field Stop | 50 | 2.0 | SP6-P | - | APTGT50TA170PG |

All Power Modules RoHS Compliant

# IGBT Power Modules



## PHASE LEG

| $V_{CES}$ (V) | IGBT Type | $I_C$(A) $T_C$=80° C | $V_{CE(ON)}$ at rated Ic | Package Style | NTC | Part Number |
|---|---|---|---|---|---|---|
| 600 | NPT | 30 | 2.1 | SP1 | YES | APTGF30A60T1G |
| | | 50 | 2.1 | SP1 | YES | APTGF50A60T1G |
| | | 90 | 2.1 | SP1 | YES | APTGF90A60T1G |
| | | 90 | 2.0 | D1 | - | APTGF90A60D1G |
| | | 90 | 2.1 | SP4 | YES | APTGF90A60TG |
| | | 165 | 2.0 | D1 | - | APTGF165A60D1G |
| | | 180 | 2.0 | D3 | - | APTGF180A60D3G |
| | | 180 | 2.1 | SP4 | YES | APTGF180A60TG |
| | | 330 | 2.0 | D3 | - | APTGF330A60D3G |
| | | 350 | 2.1 | SP6 | - | APTGF350A60G |
| | Field Stop Trench | 20 | 1.5 | SP1 | YES | APTGT20A60T1G |
| | | 30 | 1.5 | SP1 | YES | APTGT30A60T1G |
| | | 50 | 1.5 | SP1 | YES | APTGT50A60T1G |
| | | 75 | 1.5 | SP1 | YES | APTGT75A60T1G |
| | | 100 | 1.5 | SP1 | YES | APTGT100A60T1G |
| | | 100 | 1.5 | SP4 | YES | APTGT100A60TG |
| | | 150 | 1.5 | SP1 | YES | APTGT150A60T1G |
| | | 150 | 1.5 | SP4 | YES | APTGT150A60TG |
| | | 200 | 1.5 | SP4 | YES | APTGT200A60TG |
| | | 300 | 1.4 | SP6 | - | APTGT300A60G |
| | | 450 | 1.4 | SP6 | - | APTGT450A60G |
| | | 600 | 1.4 | SP6 | - | APTGT600A60G |
| 1200 | NPT | 15 | 3.2 | SP1 | YES | APTGF15A120T1G |
| | | 25 | 3.2 | SP1 | YES | APTGF25A120T1G |
| | | 50 | 3.2 | SP1 | YES | APTGF50A120T1G |
| | | 50 | 3.2 | SP4 | YES | APTGF50A120TG |
| | | 100 | 3.2 | SP4 | YES | APTGF100A120TG |
| | | 150 | 3.2 | SP4 | YES | APTGF150A120TG |
| | | 300 | 3.2 | SP6 | - | APTGF300A120G |
| | Field Stop Trench | 25 | 1.7 | SP1 | YES | APTGT25A120T1G |
| | | 25 | 1.7 | D1 | - | APTGT25A120D1G |
| | | 35 | 1.7 | SP1 | YES | APTGT35A120T1G |
| | | 50 | 1.7 | SP1 | YES | APTGT50A120T1G |
| | | 50 | 1.7 | D1 | - | APTGT50A120D1G |
| | | 50 | 1.7 | SP4 | YES | APTGT50A120TG |
| | | 75 | 1.7 | SP1 | YES | APTGT75A120T1G |
| | | 75 | 1.7 | SP4 | YES | APTGT75A120TG |
| | | 100 | 1.7 | D1 | - | APTGT100A120D1G |
| | | 100 | 1.7 | SP4 | YES | APTGT100A120TG |
| | | 150 | 1.7 | SP6 | - | APTGT150A120G |
| | | 150 | 1.7 | D1 | - | APTGT150A120D1G |
| | | 150 | 1.7 | D3 | - | APTGT150A120D3G |
| | | 150 | 1.7 | SP4 | YES | APTGT150A120TG |
| | | 200 | 1.7 | SP6 | - | APTGT200A120G |
| | | 200 | 1.7 | D3 | - | APTGT200A120D3G |
| | | 300 | 1.7 | SP6 | - | APTGT300A120G |
| | | 300 | 1.7 | D3 | - | APTGT300A120D3G |
| | | 400 | 1.7 | SP6 | - | APTGT400A120G |
| 1700 | Field Stop Trench | 30 | 2.0 | SP1 | YES | APTGT30A170T1G |
| | | 50 | 2.0 | SP1 | YES | APTGT50A170T1G |
| | | 50 | 2.0 | D1 | - | APTGT50A170D1G |
| | | 50 | 2.0 | SP4 | YES | APTGT50A170TG |
| | | 75 | 2.0 | D1 | - | APTGT75A170D1G |
| | | 100 | 2.0 | SP4 | YES | APTGT100A170TG |
| | | 150 | 2.0 | SP6 | - | APTGT150A170G |
| | | 150 | 2.0 | D3 | - | APTGT150A170D3G |
| | | 200 | 2.0 | D3 | - | APTGT200A170D3G |
| | | 225 | 2.0 | SP6 | - | APTGT225A170G |
| | | 300 | 2.0 | SP6 | - | APTGT300A170G |
| | | 300 | 2.0 | D3 | - | APTGT300A170D3G |

D1

D3

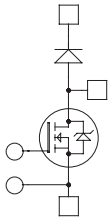
SP1

SP4

SP6

All Power Modules RoHS Compliant

## BOOST CHOPPER



| $V_{DSS}$ (V) | MOSFET Type | $R_{DS(ON)}$ m Ohms | $I_D$(A) $T_C$=80°C | Package Style | NTC | Part Number |
|---|---|---|---|---|---|---|
| 100 | MOS 5 | 11 | 100 | ISOTOP® | - | APT10M11JVRU2 |
| | MOS 7 | 4.5 | 207 | SP4 | YES | APTM10DAM05TG |
| | | 2.25 | 370 | SP6 | - | APTM10DAM02G |
| 200 | MOS 5 | 22 | 71 | ISOTOP® | - | APT20M22JVRU2 |
| | MOS 7 | 10 | 125 | SP4 | YES | APTM20DAM10TG |
| | | 8 | 147 | SP4 | YES | APTM20DAM08TG |
| | | 5 | 250 | SP6 | - | APTM20DAM05G |
| | | 4 | 300 | SP6 | - | APTM20DAM04G |
| 500 | MOS 5 | 100 | 30 | ISOTOP® | - | APT5010JVRU2 |
| | MOS 7 | 100 | 30 | ISOTOP® | - | APT5010JLLU2 |
| | | 75 | 32 | ISOTOP® | - | APT50M75JLLU2 |
| | | 38 | 64 | SP4 | YES | APTM50DAM38TG |
| | | 35 | 70 | SP4 | YES | APTM50DAM35TG |
| | | 19 | 125 | SP6 | - | APTM50DAM19G |
| | | 17 | 140 | SP6 | - | APTM50DAM17G |
| 600 | COOLMOS | 70 | 24 | SP1 | YES | APTC60DAM24T1G |
| | | 70 | 40 | ISOTOP® | - | APT40N60JCU2 |
| | | 35 | 54 | SP1 | YES | APTC60DAM35T1G |
| | | 24 | 70 | ISOTOP® | - | APT50N60JCU2 |
| 800 | COOLMOS | 150 | 21 | SP1 | YES | APTC80DA15T1G |
| 1000 | MOS 7 | 180 | 33 | SP4 | YES | APTM100DA18TG |
| | | 90 | 59 | SP6 | - | APTM100DAM90G |
| | MOS 8 | 180 | 30 | SP1 | YES | APTM100DA18T1G |
| | | 330 | 17 | SP1 | YES | APTM100DA33T1G |
| | | 400 | 15 | SP1 | YES | APTM120DA40T1G |
| 1200 | MOS 7 | 290 | 25 | SP4 | YES | APTM120DA29TG |
| | | 150 | 45 | SP6 | - | APTM120DA15G |
| | MOS 8 | 300 | 23 | SP1 | YES | APTM120DA30T1G |
| | | 560 | 13 | SP1 | YES | APTM120DA56T1G |
| | | 680 | 11 | SP1 | YES | APTM120DA68T1G |

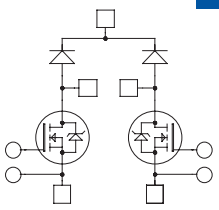
SOT-227

SP1

SP3

SP4

## DUAL BOOST CHOPPER

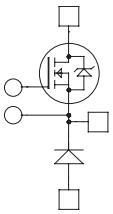


| $V_{DSS}$ (V) | MOSFET Type | $R_{DS(ON)}$ m Ohms | $I_D$(A) $T_C$=80°C | Package Style | NTC | Part Number |
|---|---|---|---|---|---|---|
| 100 | MOS 7 | 19 | 50 | SP3 | YES | APTM10DDAM19T3G |
| | | 9 | 100 | SP3 | YES | APTM10DDAM09T3G |
| 500 | MOS 7 | 100 | 24 | SP3 | YES | APTM50DDA10T3G |
| | | 65 | 37 | SP3 | YES | APTM50DDAM65T3G |
| 600 | COOLMOS | 70 | 29 | SP3 | YES | APTC60DDAM70T3G |
| | | 35 | 54 | SP3 | YES | APTC60DDAM35T3G |
| 800 | COOLMOS | 290 | 11 | SP3 | YES | APTC80DDA29T3G |
| | | 150 | 21 | SP3 | YES | APTC80DDA15T3G |
| 1000 | MOS 7 | 350 | 17 | SP3 | YES | APTM100DDA35T3G |
| 1200 | MOS 7 | 570 | 13 | SP3 | YES | APTM120DDA57T3G |

SP6

# MOSFET Power Modules

## BUCK CHOPPER



| $V_{DSS}$ (V) | MOSFET Type | $R_{DS(ON)}$ m Ohms | $I_D$(A) $T_C$=80° C | Package Style | NTC | Part Number |
|---|---|---|---|---|---|---|
| 100 | MOS 5 | 11 | 100 | ISOTOP® | - | APT10M11JVRU3 |
| | MOS 7 | 4.5 | 207 | SP4 | YES | APTM10SKM05TG |
| | | 2.25 | 370 | SP6 | - | APTM10SKM02G |
| 200 | MOS 5 | 22 | 71 | ISOTOP® | - | APT20M22JVRU3 |
| | MOS 7 | 10 | 125 | SP4 | YES | APTM20SKM10TG |
| | | 8 | 147 | SP4 | YES | APTM20SKM08TG |
| | | 5 | 250 | SP6 | - | APTM20SKM05G |
| | | 4 | 300 | SP6 | - | APTM20SKM04G |
| 500 | MOS 5 | 100 | 30 | ISOTOP® | - | APT5010JVRU3 |
| | MOS 7 | 100 | 30 | ISOTOP® | - | APT5010JLLU3 |
| | | 75 | 32 | ISOTOP® | - | APT50M75JLLU3 |
| | | 38 | 64 | SP4 | YES | APTM50SKM38TG |
| | | 35 | 70 | SP4 | YES | APTM50SKM35TG |
| | | 19 | 125 | SP6 | - | APTM50SKM19G |
| | | 17 | 140 | SP6 | - | APTM50SKM17G |
| 600 | COOLMOS | 70 | 40 | ISOTOP® | - | APT40N60JCU3 |
| | | 35 | 54 | SP1 | YES | APTC60SKM35T1G |
| | | 24 | 70 | SP1 | YES | APTC60SKM24T1G |
| 800 | COOLMOS | 150 | 21 | SP1 | YES | APTC80SK15T1G |
| 1000 | MOS 7 | 180 | 33 | SP4 | YES | APTM100SK18TG |
| | | 90 | 59 | SP6 | - | APTM100SKM90G |
| | MOS 8 | 400 | 15 | SP1 | YES | APTM100SK40T1G |
| | | 330 | 17 | SP1 | YES | APTM100SK33T1G |
| 1200 | MOS 7 | 290 | 25 | SP4 | YES | APTM120SK29TG |
| | | 150 | 45 | SP6 | - | APTM120SK15G |
| | MOS 8 | 680 | 11 | SP1 | YES | APTM120SK68T1G |
| | | 560 | 13 | SP1 | YES | APTM120SK56T1G |

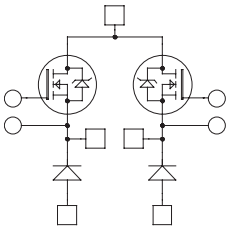
SOT-227

SP1

SP3

SP4

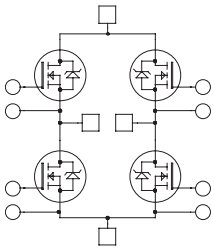
## DUAL BUCK CHOPPER



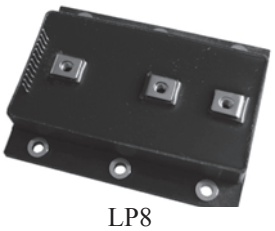
| $V_{DSS}$ (V) | MOSFET TYPE | $R_{DS(ON)}$ m Ohms | $I_D$(A) $T_C$=80° C | Package Style | NTC | Part Number |
|---|---|---|---|---|---|---|
| 100 | MOS 7 | 19 | 50 | SP3 | YES | APTM10DSKM19T3G |
| | | 9 | 100 | SP3 | YES | APTM10DSKM09T3G |
| 500 | MOS 7 | 100 | 24 | SP3 | YES | APTM50DSK10T3G |
| | | 65 | 37 | SP3 | YES | APTM50DSKM65T3G |
| 600 | COOLMOS | 70 | 29 | SP3 | YES | APTC60DSKM70T3G |
| | | 35 | 54 | SP3 | YES | APTC60DSKM35T3G |
| 800 | COOLMOS | 290 | 11 | SP3 | YES | APTC80DSK29T3G |
| | | 150 | 21 | SP3 | YES | APTC80DSK15T3G |
| 1000 | MOS 7 | 350 | 17 | SP3 | YES | APTM100DSK35T3G |
| 1200 | MOS 7 | 570 | 13 | SP3 | YES | APTM120DSK57T3G |

SP6

## FULL BRIDGE



| $V_{DSS}$ (V) | MOSFET TYPE | $R_{DS(ON)}$ m Ohms | $I_D$(A) $T_C$=80°C | Package Style | NTC | Part Number |
|---|---|---|---|---|---|---|
| 100 | FREDFET 7 | 4.5 | 207 | SP6 | - | APTM10HM05FG |
| | | 19 | 50 | SP3 | YES | APTM10HM19FT3G |
| | | 9 | 100 | SP3 | YES | APTM10HM09FT3G |
| | | 9 | 100 | SP4 | YES | APTM10HM09FTG |
| 200 | FREDFET 7 | 20 | 62 | SP4 | YES | APTM20HM20FTG |
| | | 16 | 74 | SP4 | YES | APTM20HM16FTG |
| | | 10 | 125 | SP6 | - | APTM20HM10FG |
| | | 8 | 147 | SP6 | - | APTM20HM08FG |
| 500 | FREDFET 7 | 140 | 18 | SP3 | YES | APTM50H14FT3G |
| | | 100 | 24 | SP3 | YES | APTM50H10FT3G |
| | | 75 | 32 | SP4 | YES | APTM50HM75FTG |
| | | 75 | 32 | SP3 | YES | APTM50HM75FT3G |
| | | 65 | 37 | SP4 | YES | APTM50HM65FTG |
| | | 65 | 37 | SP3 | YES | APTM50HM65FT3G |
| | | 38 | 64 | SP6 | - | APTM50HM38FG |
| | | 35 | 70 | SP6 | - | APTM50HM35FG |
| | FREDFET 8 | 19 | 150 | SP1 | YES | APTM50H15UT1G |
| 600 | COOLMOS | 70 | 29 | SP1 | YES | APTC60HM70T1G |
| | | 70 | 29 | SP3 | YES | APTC60HM70T3G |
| | | 45 | 38 | SP1 | YES | APTC60HM45T1G |
| | | 35 | 54 | SP3 | YES | APTC60HM35T3G |
| | FREDFET 8 | 230 | 15 | SP1 | YES | APTM60H23UT1G |
| 800 | COOLMOS | 290 | 11 | SP1 | YES | APTC80H29T1G |
| | | 290 | 11 | SP3 | YES | APTC80H29T3G |
| | | 150 | 29 | SP1 | YES | APTC80H15T1G |
| | | 150 | 21 | SP3 | YES | APTC80H15T3G |
| 1000 | FREDFET 7 | 450 | 14 | SP3 | YES | APTM100H45FT3G |
| | | 350 | 17 | SP4 | YES | APTM100H35FTG |
| | | 350 | 17 | SP3 | YES | APTM100H35FT3G |
| | | 180 | 33 | SP6 | - | APTM100H18FG |
| | FREDFET 8 | 800 | 8 | SP1 | YES | APTM100H80FT1G |
| 1200 | FREDFET 7 | 570 | 13 | SP4 | YES | APTM120H57FTG |
| | | 570 | 13 | SP3 | YES | APTM120H57FT3G |
| | | 290 | 25 | SP6 | - | APTM120H29FG |
| | FREDFET 8 | 1400 | 6 | SP1 | YES | APTM120H140FT1G |



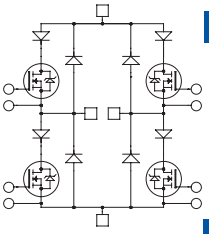
LP8

SP1

SP3

SP4

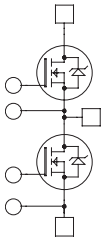
## FULL BRIDGE + SERIES AND PARALLEL DIODES



| $V_{DSS}$ (V) | MOSFET TYPE | $R_{DS(ON)}$ m Ohms | $I_D$(A) $T_C$=80°C | Package Style | NTC | Part Number |
|---|---|---|---|---|---|---|
| 200 | MOS 7 | 20 | 62 | SP4 | YES | APTM20HM20STG |
| 500 | MOS 7 | 75 | 32 | SP4 | YES | APTM50HM75STG |
| 1000 | MOS 7 | 450 | 13 | SP4 | YES | APTM100H45STG |

SP6

## PHASE LEG

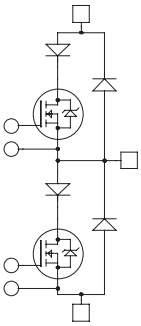


| $V_{DSS}$ (V) | MOSFET TYPE | $R_{DS(ON)}$ m Ohms | $I_D$(A) $T_C$=80°C | Package Style | NTC | Part Number |
|---|---|---|---|---|---|---|
| 100 | FREDFET 7 | 4.5 | 207 | SP4 | YES | APTM10AM05FTG |
| | | 2.25 | 370 | SP6 | - | APTM10AM02FG |
| 200 | FREDFET 7 | 10 | 125 | SP4 | YES | APTM20AM10FTG |
| | | 8 | 147 | SP4 | YES | APTM20AM08FTG |
| | | 5 | 250 | SP6 | - | APTM20AM05FG |
| | | 5 | 250 | LP8 | YES | APTM20AM05FTG |
| | | 4 | 300 | SP6 | - | APTM20AM04FG |
| 500 | FREDFET 7 | 38 | 64 | SP4 | YES | APTM50AM38FTG |
| | | 35 | 70 | SP4 | YES | APTM50AM35FTG |
| | | 25 | 110 | LP8 | YES | APTM50AM25FTG |
| | | 19 | 125 | SP6 | - | APTM50AM19FG |
| | | 17 | 140 | SP6 | - | APTM50AM17FG |
| | FREDFET 8 | 150 | 19 | SP1 | YES | APTM50A15UT1G |
| | | 70 | 37 | SP1 | YES | APTM50AM70UT1G |
| 600 | COOLMOS | 24 | 70 | SP1 | YES | APTC60AM24T1G |
| | | 35 | 54 | SP1 | YES | APTC60AM35T1G |
| | | 45 | 38 | SP1 | YES | APTC60AM45T1G |
| | | 70 | 29 | SP1 | YES | APTC60AM70T1G |
| | FREDFET8 | 110 | 30 | SP1 | YES | APTM60A11UT1G |
| | | 230 | 15 | SP1 | YES | APTM60A23UT1G |
| 800 | COOLMOS | 150 | 21 | SP1 | YES | APTC80A15T1G |
| 1000 | FREDFET 7 | 180 | 33 | SP4 | YES | APTM100A18FTG |
| | | 90 | 59 | SP6 | - | APTM100AM90FG |
| | FREDFET 8 | 400 | 16 | SP1 | YES | APTM100A40FT1G |
| | | 460 | 14 | SP1 | YES | APTM100A46FT1G |
| 1200 | FREDFET 7 | 290 | 25 | SP4 | YES | APTM120A29FTG |
| | | 150 | 45 | SP6 | - | APTM120A15FG |
| | FREDFET8 | 650 | 12 | SP1 | YES | APTM120A65FT1G |
| | | 800 | 10 | SP1 | YES | APTM120A80FT1G |

All Power Modules RoHS Compliant

# MOSFET Power Modules

## PHASE LEG + SERIES AND PARALLEL DIODES

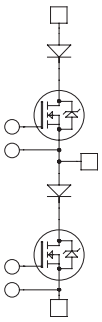


| $V_{DSS}$ (V) | MOSFET Type | $R_{DS(ON)}$ m Ohms | $I_D$(A) $T_C$=80° C | Package Style | NTC | Part Number |
|---|---|---|---|---|---|---|
| 200 | MOS 7 | 10 | 125 | SP4 | YES | APTM20AM10STG |
| | | 6 | 225 | SP6 | - | APTM20AM06SG |
| 500 | MOS 7 | 38 | 64 | SP4 | YES | APTM50AM38STG |
| | | 24 | 110 | SP6 | - | APTM50AM24SG |
| | | 19 | 125 | LP8W | YES | APTM50AM19STG |
| 1000 | MOS 7 | 230 | 26 | SP4 | YES | APTM100A23STG |
| | | 130 | 49 | SP6 | - | APTM100A13SG |
| | | 120 | 50 | LP8W | YES | APTM100A12STG |
| 1200 | MOS 7 | 200 | 37 | SP6 | - | APTM120A20SG |

LP8W

SP4

## PHASE LEG + SERIES DIODES

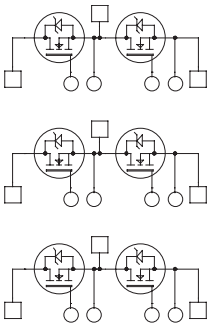


| $V_{DSS}$ (V) | MOSFET Type | $R_{DS(ON)}$ m Ohms | $I_D$(A) $T_C$=80° C | Package Style | NTC | Part Number |
|---|---|---|---|---|---|---|
| 1000 | MOS 7 | 130 | 49 | SP6 | - | APTM100A13DG |
| 1200 | MOS 7 | 200 | 37 | SP6 | - | APTM120A20DG |

SP6

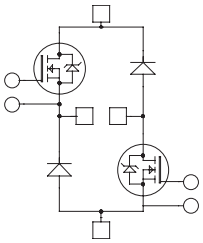
SP6-P

## TRIPLE PHASE LEG



| $V_{DSS}$ (V) | MOSFET Type | $R_{DS(ON)}$ m Ohms | $I_D$(A) $T_C$=80° C | Package Style | NTC | Part Number |
|---|---|---|---|---|---|---|
| 75 | MOS 7 | 4.2 | 90 | SP6-P | - | APTM08TAM04PG |
| 100 | FREDFET 7 | 19 | 50 | SP6-P | - | APTM10TAM19FPG |
| | | 9 | 100 | SP6-P | - | APTM10TAM09FPG |
| 200 | FREDFET 7 | 16 | 74 | SP6-P | - | APTM20TAM16FPG |
| 500 | FREDFET 7 | 65 | 37 | SP6-P | - | APTM50TAM65FPG |
| 600 | COOLMOS | 35 | 54 | SP6-P | - | APTC60TAM35PG |
| 800 | COOLMOS | 150 | 21 | SP6-P | - | APTC80TA15PG |
| 1000 | FREDFET 7 | 350 | 17 | SP6-P | - | APTM100TA35FPG |
| 1200 | FREDFET 7 | 570 | 13 | SP6-P | - | APTM120TA57FPG |

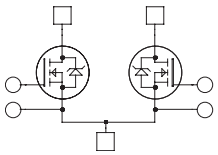
## ASYMMETRICAL BRIDGE



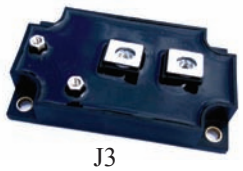
| $V_{DSS}$ (V) | MOSFET Type | $R_{DS(ON)}$ m Ohms | $I_D$(A) $T_C$=80° C | Package Style | NTC | Part Number |
|---|---|---|---|---|---|---|
| 100 | MOS 7 | 4.5 | 207 | SP6 | - | APTM10DHM05G |
| | | 9 | 100 | SP4 | YES | APTM10DHM09TG |
| 200 | MOS 7 | 20 | 62 | SP4 | YES | APTM20DHM20TG |
| | | 16 | 74 | SP4 | YES | APTM20DHM16TG |
| | | 10 | 125 | SP6 | - | APTM20DHM10G |
| | | 8 | 147 | SP6 | - | APTM20DHM08G |
| 500 | MOS 7 | 75 | 32 | SP4 | YES | APTM50DHM75TG |
| | | 65 | 37 | SP4 | YES | APTM50DHM65TG |
| | | 38 | 64 | SP6 | - | APTM50DHM38G |
| | | 35 | 70 | SP6 | - | APTM50DHM35G |

All Power Modules RoHS Compliant

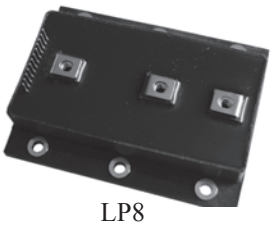
## DUAL COMMON SOURCE



| $V_{DSS}$ (V) | MOSFET Type | $R_{DS(ON)}$ m Ohms | $I_D$(A) $T_C$=80° C | Package Style | NTC | Part Number |
|---|---|---|---|---|---|---|
| 100 | MOS 7 | 4.5 | 207 | SP4 | YES | APTM10DUM05TG |
| | | 2.25 | 370 | SP6 | - | APTM10DUM02G |
| 200 | MOS 7 | 10 | 125 | SP4 | YES | APTM20DUM10TG |
| | | 8 | 147 | SP4 | YES | APTM20DUM08TG |
| | | 5 | 250 | SP6 | - | APTM20DUM05G |
| | | 5 | 250 | LP8 | YES | APTM20DUM05TG |
| | | 4 | 300 | SP6 | - | APTM20DUM04G |
| 500 | MOS 7 | 38 | 64 | SP4 | YES | APTM50DUM38TG |
| | | 35 | 70 | SP4 | YES | APTM50DUM35TG |
| | | 25 | 110 | LP8 | YES | APTM50DUM25TG |
| | | 19 | 125 | SP6 | - | APTM50DUM19G |
| | | 17 | 140 | SP6 | - | APTM50DUM17G |
| 1000 | MOS 7 | 180 | 33 | SP4 | YES | APTM100DU18TG |
| | | 90 | 59 | SP6 | - | APTM100DUM90G |
| 1200 | MOS 7 | 290 | 25 | SP4 | YES | APTM120DU29TG |
| | | 150 | 45 | SP6 | - | APTM120DU15G |

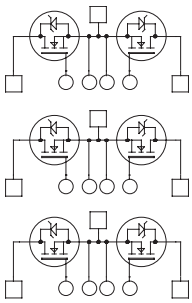


J3



LP8

## TRIPLE DUAL COMMON SOURCE

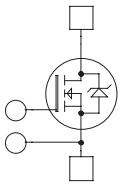


| $V_{DSS}$ (V) | MOSFET Type | $R_{DS(ON)}$ m Ohms | $I_D$(A) $T_C$=80° C | Package Style | NTC | Part Number |
|---|---|---|---|---|---|---|
| 75 | MOS 7 | 4.2 | 90 | SP6-P | - | APTM08TDUM04PG |
| 100 | MOS 7 | 19 | 50 | SP6-P | - | APTM10TDUM19PG |
| | | 9 | 100 | SP6-P | - | APTM10TDUM09PG |
| 200 | MOS 7 | 16 | 74 | SP6-P | - | APTM20TDUM16PG |
| 500 | MOS 7 | 65 | 37 | SP6-P | - | APTM50TDUM65PG |
| 600 | COOLMOS | 35 | 54 | SP6-P | - | APTC60TDUM35PG |
| 800 | COOLMOS | 150 | 21 | SP6-P | - | APTC80TDU15PG |
| 1000 | MOS 7 | 350 | 17 | SP6-P | - | APTM120TDU35PG |
| 1200 | MOS 7 | 570 | 13 | SP6-P | - | APTM120TDU57PG |

SP4

SP6

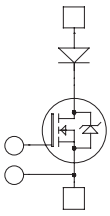
## SINGLE SWITCH



| $V_{DSS}$ (V) | MOSFET Type | $R_{DS(ON)}$ m Ohms | $I_D$(A) $T_C$=80° C | Package Style | NTC | Part Number |
|---|---|---|---|---|---|---|
| 100 | FREDFET 7 | 2.25 | 430 | SP6 | - | APTM10UM02FAG |
| | | 1.50 | 640 | SP6 | - | APTM10UM01FAG |
| 200 | FREDFET 7 | 3 | 434 | SP6 | - | APTM20UM03FAG |
| 500 | FREDFET 7 | 9 | 371 | SP6 | - | APTM50UM09FAG |
| 1000 | FREDFET 7 | 60 | 97 | SP6 | - | APTM100UM60FAG |
| | | 45 | 160 | SP6 | - | APTM100UM45FAG |
| 1200 | FREDFET 7 | 95 | 77 | SP6 | - | APTM120UM95FAG |
| | | 70 | 126 | SP6 | - | APTM120UM70FAG |

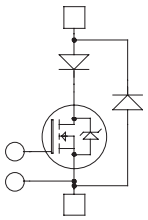
SP6-P

## SINGLE SWITCH + SERIES DIODE



| $V_{DSS}$ (V) | MOSFET Type | $R_{DS(ON)}$ m Ohms | $I_D$(A) $T_C$=80° C | Package Style | NTC | Part Number |
|---|---|---|---|---|---|---|
| 1000 | MOS 7 | 65 | 110 | SP6 | - | APTM100UM65DAG |
| | | 45 | 160 | SP6 | - | APTM100UM45DAG |
| 1200 | MOS 7 | 100 | 86 | SP6 | - | APTM120U10DAG |
| | | 70 | 126 | SP6 | - | APTM120UM70DAG |

## SINGLE SWITCH + SERIES AND PARALLEL DIODES

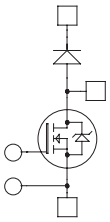


| $V_{DSS}$ (V) | MOSFET Type | $R_{DS(ON)}$ m Ohms | $I_D$(A) $T_C$=80° C | Package Style | NTC | Part Number |
|---|---|---|---|---|---|---|
| 200 | MOS 7 | 9 | 145 | J3 | - | APTM20UM09SG |
| | | 5 | 237 | J3 | - | APTM20UM05SG |
| | | 4 | 310 | SP6 | - | APTM20UM04SAG |
| 500 | MOS 7 | 25 | 110 | J3 | - | APTM50UM25SG |
| | | 19 | 122 | J3 | - | APTM50UM19SG |
| | | 13 | 250 | SP6 | - | APTM50UM13SAG |
| 1000 | MOS 7 | 130 | 48 | J3 | - | APTM100U13SG |
| | | 65 | 100 | SP6 | - | APTM100UM65SAG |
| 1200 | MOS 7 | 100 | 86 | SP6 | - | APTM120U10SAG |



All Power Modules RoHS Compliant

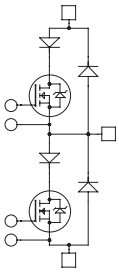
# MOSFET Power Modules with SiC Diodes



## BOOST CHOPPER WITH SiC DIODES

| $V_{DSS}$ (V) | MOSFET Type | $R_{DS(ON)}$ m Ohms | $I_D$(A) $T_C$=80° C | Package Style | NTC | Part Number |
|---|---|---|---|---|---|---|
| 500 | MOS 7 | 38 | 67 | SP4 | YES | APTM50DAM38CTG |

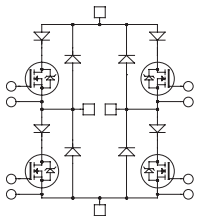
SOT-227



## PHASE LEG + SERIES AND SiC PARALLEL DIODES

| $V_{DSS}$ (V) | MOSFET Type | $R_{DS(ON)}$ m Ohms | $I_D$(A) $T_C$=80° C | Package Style | NTC | Part Number |
|---|---|---|---|---|---|---|
| 500 | MOS 7 | 38 | 67 | SP4 | YES | APTM50AM38SCTG |
| | | 24 | 110 | SP6 | - | APTM50AM24SCG |
| 1000 | MOS 7 | 230 | 27 | SP4 | YES | APTM100A23SCTG |
| | | 130 | 49 | SP6 | - | APTM100A13SCG |

SP4

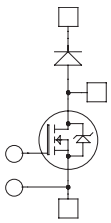


## FULL BRIDGE + SERIES AND SiC PARALLEL DIODES

| $V_{DSS}$ (V) | MOSFET Type | $R_{DS(ON)}$ m Ohms | $I_D$(A) $T_C$=80° C | Package Style | NTC | Part Number |
|---|---|---|---|---|---|---|
| 500 | MOS 7 | 75 | 34 | SP4 | YES | APTM50HM75SCTG |
| 1000 | MOS 7 | 450 | 14 | SP4 | YES | APTM100H45SCTG |

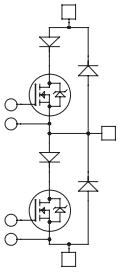
SP6

# COOLMOS™ Power Modules with SiC Diodes



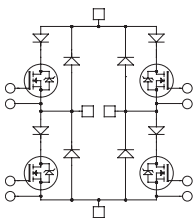
## BOOST CHOPPER WITH SiC DIODES

| $V_{DSS}$ (V) | MOSFET Type | $R_{DS(ON)}$ m Ohms | $I_D$(A) $T_C$=80° C | Package Style | NTC | Part Number |
|---|---|---|---|---|---|---|
| 600 | COOLMOS | 45 | 38 | ISOTOP® | - | APTC50N60JCCU2 |
| | | 18 | 107 | SP4 | YES | APTC60DAM18CTG |



## PHASE LEG + SERIES AND SiC PARALLEL DIODES

| $V_{DSS}$ (V) | MOSFET TYPE | $R_{DS(ON)}$ m Ohms | $I_D$(A) $T_C$=80° C | Package Style | NTC | Part Number |
|---|---|---|---|---|---|---|
| 600 | COOLMOS | 35 | 54 | SP4 | YES | APTC60AM35SCTG |
| | | 18 | 107 | SP6 | - | APTC60AM18SCG |
| 800 | COOLMOS | 150 | 21 | SP4 | YES | APTC80A15SCTG |
| | | 100 | 32 | SP4 | YES | APTC80A10SCTG |
| | | 75 | 43 | SP6 | - | APTC80AM75SCG |



## FULL BRIDGE + SERIES AND SiC PARALLEL DIODES

| $V_{DSS}$ (V) | MOSFET TYPE | $R_{DS(ON)}$ m Ohms | $I_D$(A) $T_C$=80° C | Package Style | NTC | Part Number |
|---|---|---|---|---|---|---|
| 600 | COOLMOS | 70 | 29 | SP4 | YES | APTC60HM70SCTG |
| 800 | COOLMOS | 290 | 11 | SP4 | YES | APTC80H29SCTG |

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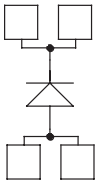
All Power Modules RoHS Compliant

# DIODE Power Modules

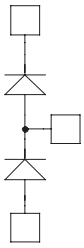
## SINGLE DIODE



| $V_{RRM}$ (V) | FRED Type | IF(A) $T_C$=80°C | VF(V) $T_J$=25°C | Package Style | Part Number |
|---|---|---|---|---|---|
| 200 | FRED | 500 | 1.1 | LP4 | APTDF500U20G |
| 400 | FRED | 500 | 1.5 | LP4 | APTDF500U40G |
| 600 | FRED | 450 | 1.8 | LP4 | APTDF450U60G |
| 1000 | FRED | 430 | 2.3 | LP4 | APTDF430U100G |
| 1200 | FRED | 400 | 2.5 | LP4 | APTDF400U120G |

LP4

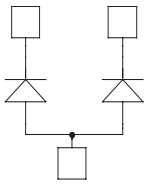
## PHASE LEG



| $V_{RRM}$ (V) | FRED Type | IF(A) $T_C$=80°C | VF(V) $T_J$=25°C | Package Style | Part Number |
|---|---|---|---|---|---|
| 200 | FRED | 400 | 1.0 | SP6 | APTDF400AK20G |
| 600 | FRED | 400 | 1.6 | SP6 | APTDF400AK60G |
| 1000 | FRED | 400 | 2.1 | SP6 | APTDF400AK100G |
| 1200 | FRED | 400 | 2.4 | SP6 | APTDF400AK120G |
| 1700 | FRED | 400 | 2.2 | SP6 | APTDF400AK170G |

SP1

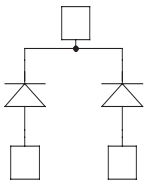
## DUAL COMMON ANODE



| $V_{RRM}$ (V) | FRED Type | IF(A) $T_C$=80°C | VF(V) $T_J$=25°C | Package Style | Part Number |
|---|---|---|---|---|---|
| 200 | FRED | 400 | 1.0 | SP6 | APTDF400AA20G |
| 600 | FRED | 400 | 1.6 | SP6 | APTDF400AA60G |
| 1000 | FRED | 400 | 2.1 | SP6 | APTDF400AA100G |
| 1200 | FRED | 400 | 2.4 | SP6 | APTDF400AA120G |
| 1700 | FRED | 400 | 2.2 | SP6 | APTDF400AA170G |

SP4

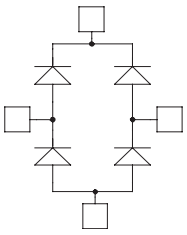
## DUAL COMMON CATHODE



| $V_{RRM}$ (V) | FRED Type | IF(A) $T_C$=80°C | VF(V) $T_J$=25°C | Package Style | Part Number |
|---|---|---|---|---|---|
| 200 | FRED | 400 | 1.0 | SP6 | APTDF400KK20G |
| 600 | FRED | 400 | 1.6 | SP6 | APTDF400KK60G |
| 1000 | FRED | 400 | 2.1 | SP6 | APTDF400KK100G |
| 1200 | FRED | 400 | 2.4 | SP6 | APTDF400KK120G |
| 1700 | FRED | 400 | 2.2 | SP6 | APTDF400KK170G |

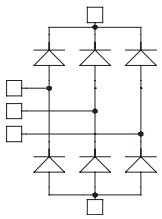
SP6

## FULL BRIDGE



| $V_{RRM}$ (V) | FRED Type | IF(A) $T_C$=80°C | VF(V) $T_J$=25°C | Package Style | Part Number |
|---|---|---|---|---|---|
| 200 | FRED | 100 | 1.0 | SP4 | APTDF100H20G |
| | | 200 | 1.0 | SP6 | APTDF200H20G |
| 600 | FRED | 30 | 1.8 | SP1 | APTDF30H601G |
| | | 60 | 1.6 | SP1 | APTDF60H601G |
| | | 100 | 1.6 | SP1 | APTDF100H601G |
| | | 100 | 1.6 | SP4 | APTDF100H60G |
| | | 200 | 1.6 | SP6 | APTDF200H60G |
| 1000 | FRED | 100 | 2.1 | SP4 | APTDF100H100G |
| | | 200 | 2.1 | SP6 | APTDF200H100G |
| 1200 | FRED | 30 | 2.6 | SP1 | APTDF30H1201G |
| | | 60 | 2.5 | SP1 | APTDF60H1201G |
| | | 100 | 2.5 | SP1 | APTDF100H1201G |
| | | 100 | 2.4 | SP4 | APTDF100H120G |
| | | 200 | 2.4 | SP6 | APTDF200H120G |
| 1700 | FRED | 100 | 2.2 | SP4 | APTDF100H170G |
| | | 200 | 2.2 | SP6 | APTDF200H170G |

## 3-PHASE BRIDE - RECTIFIER DIODE



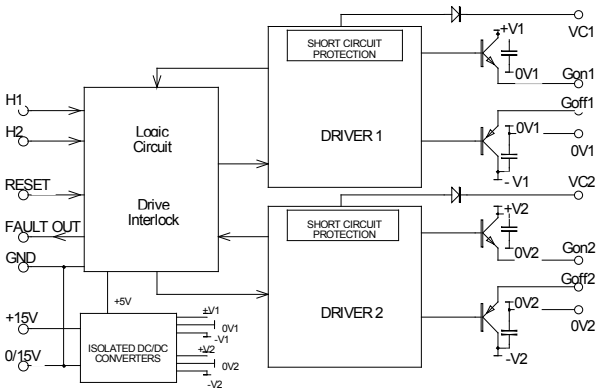
| $V_{RRM}$ (V) | FRED Type | IF(A) $T_C$=80°C | VF(V) $T_J$=25°C | Package Style | Part Number |
|---|---|---|---|---|---|
| 1600 | Rectifier | 40 | 1.3 | SP1 | APTDR40X1601G |
| | | 70 | 1.3 | SP1 | APTDR70X1601G |
| | | 90 | 1.3 | SP1 | APTDR90X1601G |

All Power Modules RoHS Compliant

# Dual IGBT Isolated Driver

| $V_{ce}$ Max (V) | $I_{OUT}$ Peak (A) | Number of Channels | $V_{GON}/V_{GOFF}$ | Input Signal Voltage | Switching Freq. (kHz) | Isolation Voltage (kV) | Part Number |
|---|---|---|---|---|---|---|---|
| 1200 | 8 | 2 | +15/-6 | 5 | 50 | 2.5 | APTRG8A120G |

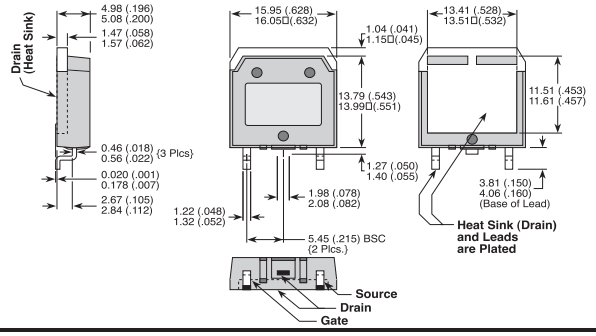
- Driver For Phase Leg IGBT up to 300A/1200V or 600A/600V
- Short Circuit Protection
- Under Voltage Lockout
- Integrated Auxillary Power Supplies
- TTL Compatible Inputs
- Very High EMI Immunity
- Fault and Reset Signals
- RGon and RGoff Externally Selectable
- Dimensions:  50.8mm(H) X 50.8mm(W) X 23.6mm(D)



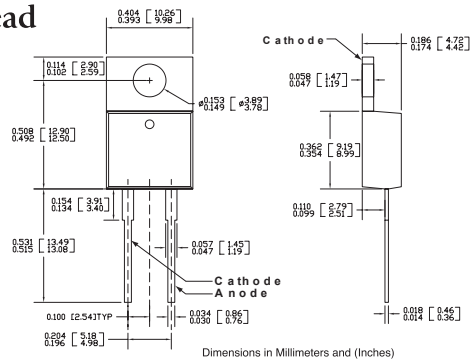
# Package Outline Drawings

Refer to web page for additional package outline drawings

## $D^3$ Pak or TO-268

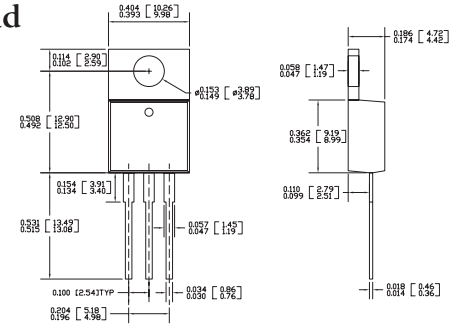



## TO-220 2-Lead



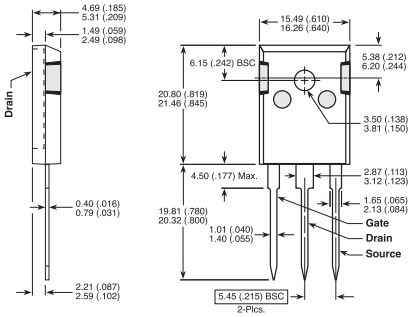

Dimensions in Millimeters and (Inches)

## TO-220 3-Lead

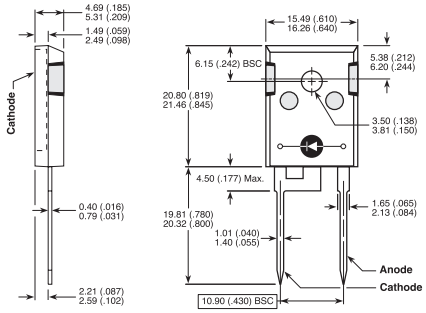



Dimensions in Millimeters and (Inches)

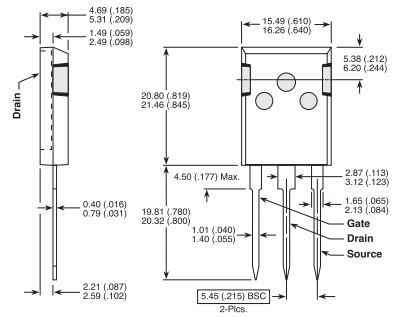
## TO-247 3-Lead




## TO-247 2-Lead

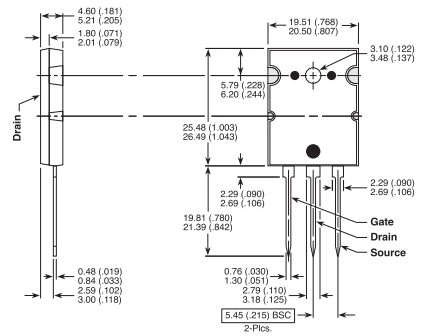



## T-MAX®

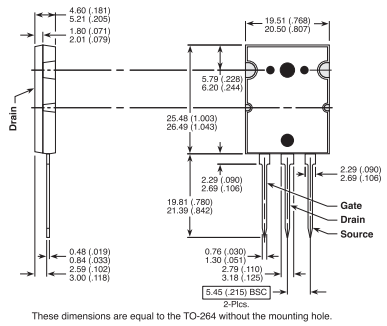



These dimensions are equal to the TO-247 without the mounting hole.

## TO-264

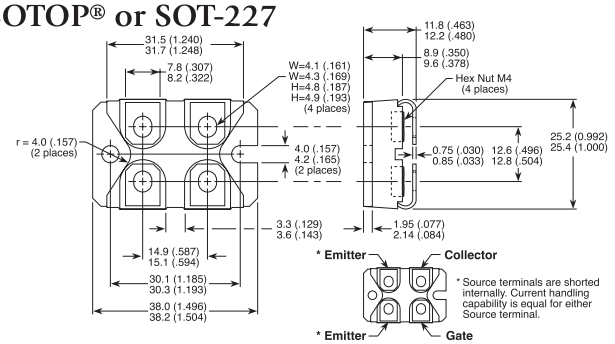



## 264 MAX™




These dimensions are equal to the TO-264 without the mounting hole.

## ISOTOP® or SOT-227

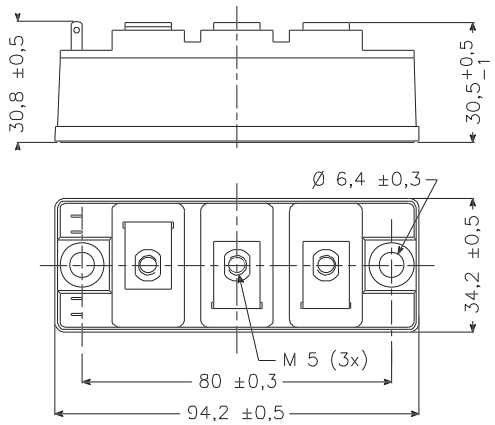



ISOTOP® is a registered trademark of SGS Thomson

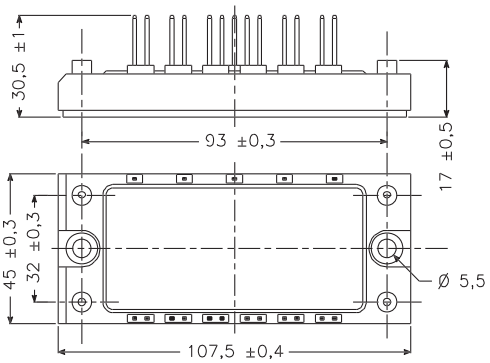
# Power Module Outlines

Pin out location depends on the module configuration. Please refer to the product datasheet for pins assignment. All dimensions in millimeter

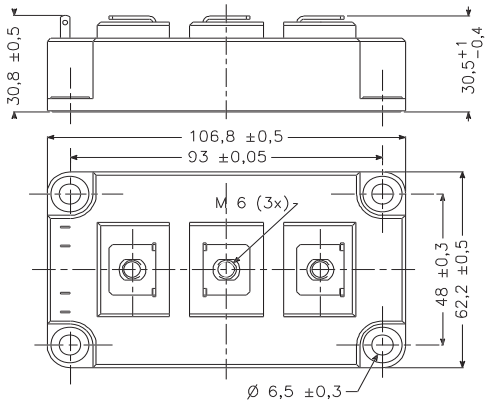
D1



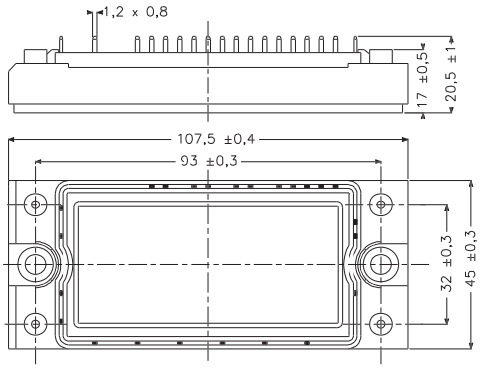

E2



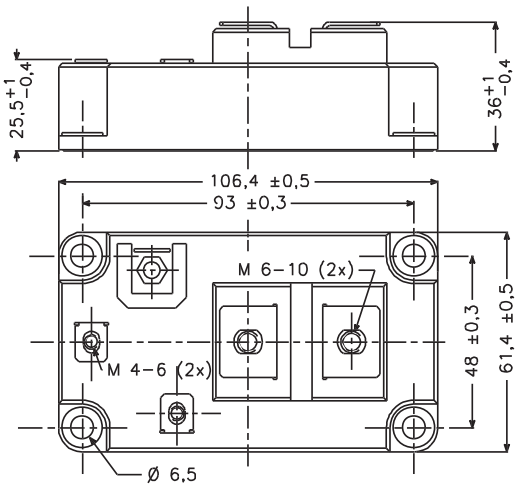

D3



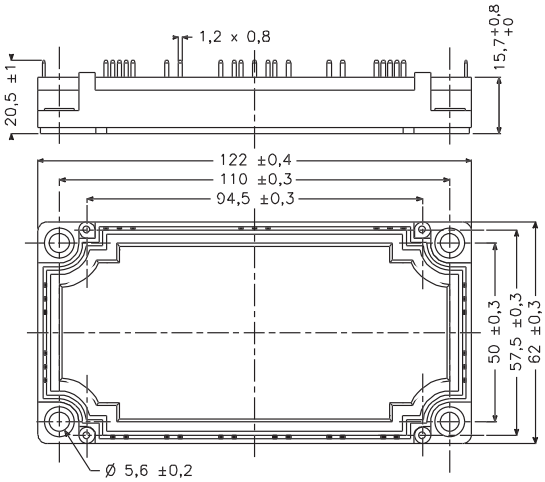

P2



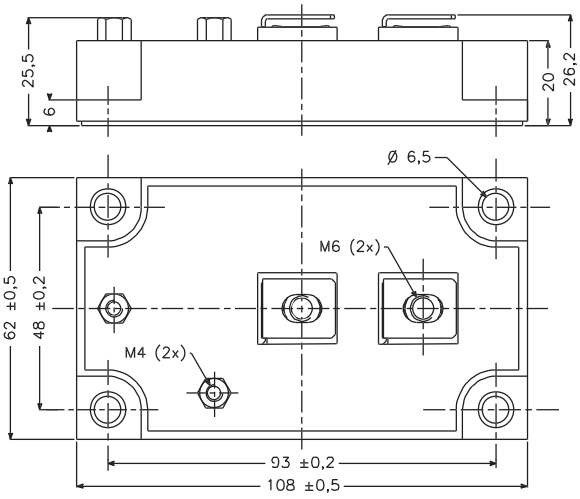

D4



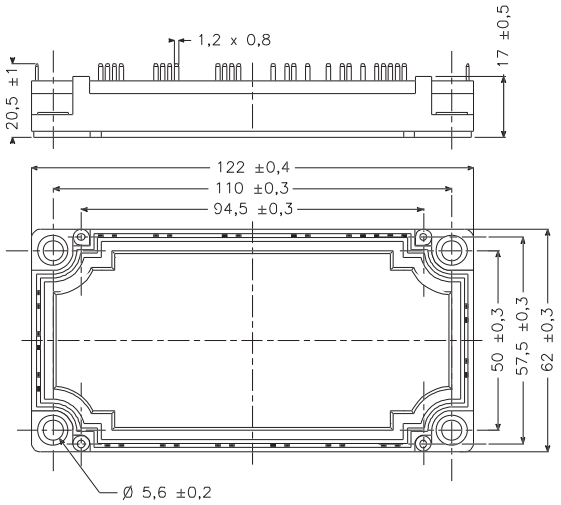

E3




J3



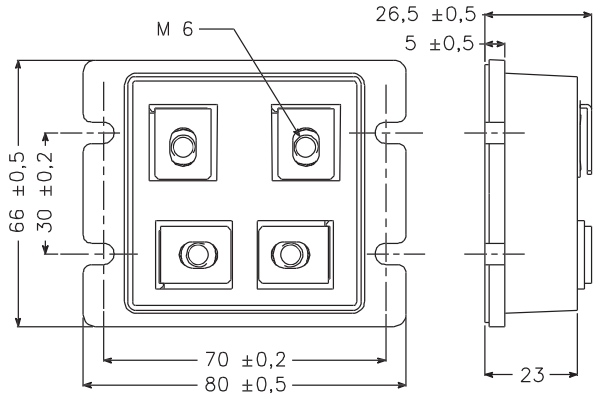

P3



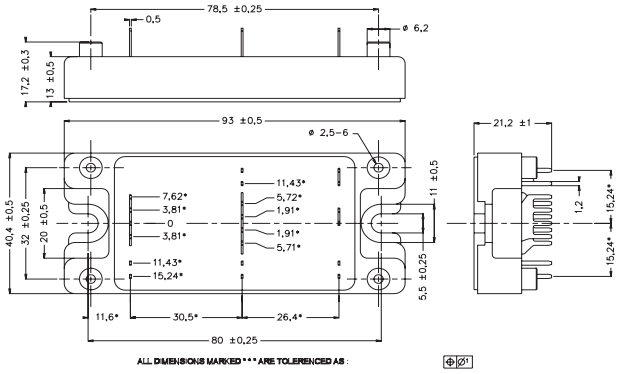
Pin out location depends on the module configuration. Please refer to the product datasheet for pins assignment. All dimensions in millimeter

# Power Module Outlines

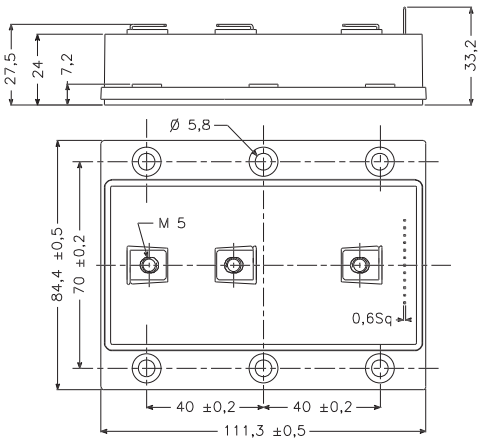
## LP4



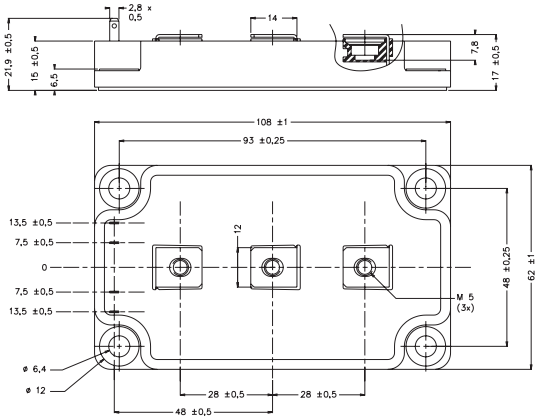

## SP4



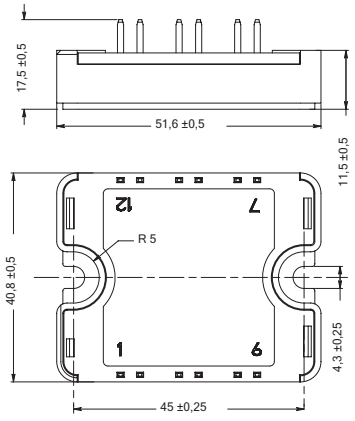

## LP8



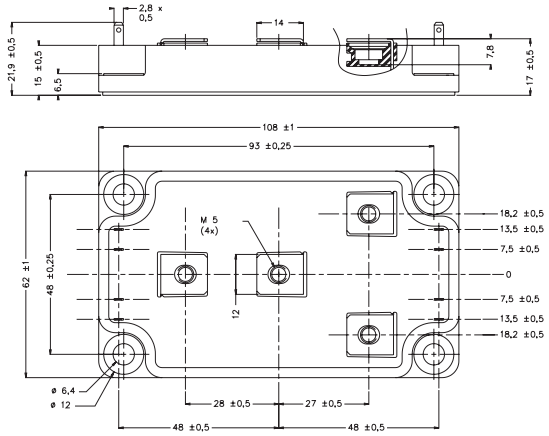

## SP6 - 3 outputs



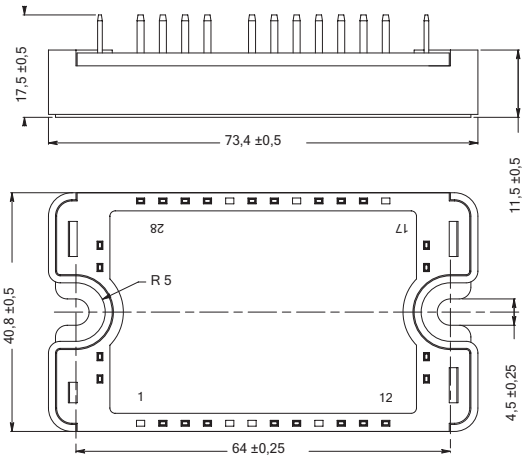

## SP1



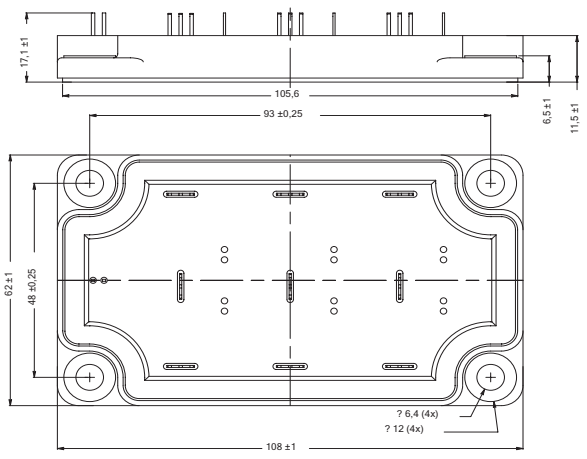

## SP6 - 4 outputs




## SP3




## SP6 -P



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