



Microsemi
Power Products Group

- **Power Semiconductors**
- **Power Modules**
- **RF Power MOSFETs**

2009 - 2010

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!

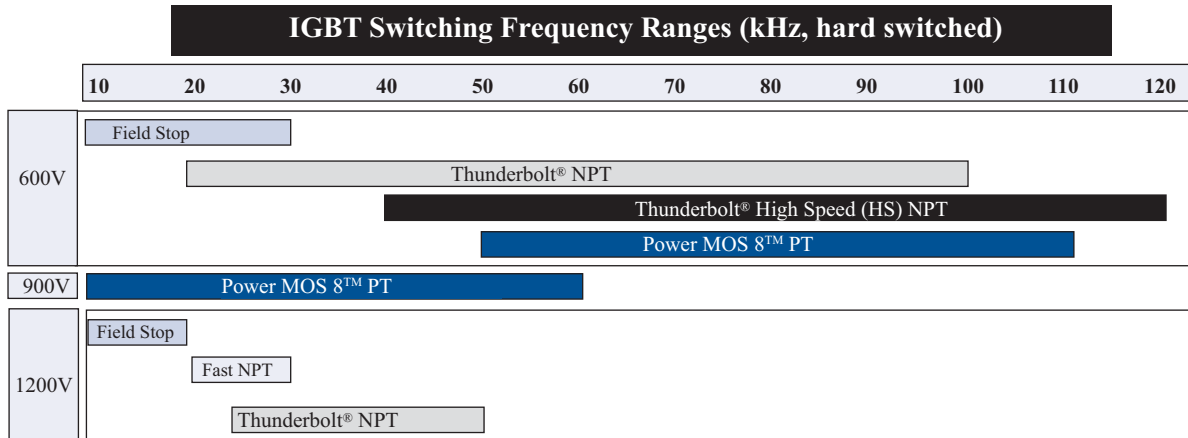
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Insulated Gate Bipolar Transistors (IGBTs)

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
Thunderbolt® 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, TO-247, T-Max®, TO-264, 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™

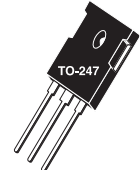
- PT Technology
- Fast Switching
- Highest Efficiency
- Combi with High Speed DQ Diode

BV _{CES} Volts	V _{CE(ON)} Typ 25°C	I _{C2} 100°C	Recommended Maximum I _C		Part Number	Package Style
SINGLE						
600	2.0	28	50 kHz	80 kHz	APT28GA60K	TO-220
		36	19	14	APT36GA60B	TO-247 or D ³
		44	21	17	APT44GA60B	TO-247 or D ³
		54	26	20	APT54GA60B	TO-247 or D ³
		68	30	23	APT68GA60B	TO-247 or D ³
		80	35	27	APT80GA60B	TO-247 or D ³
		102	40	31	APT102GA60B2	TO-247 or D ³
900	2.5	27	25 kHz	50 kHz	APT27GA90K	TO-220
		35	14	8	APT35GA90B	TO-247 or D ³
		43	17	10	APT43GA90B	TO-247 or D ³
		64	21	13	APT64GA90B	TO-247 or D ³
		80	29	19	APT80GA90B	TO-247 or D ³
		34	34	23	APT80GA90B	TO-247 or D ³
		23	34	23	APT80GA90B	TO-247 or D ³
Combi (IGBT & "DQ" FRED)						
600	2.0	28	50 kHz	80 kHz	APT28GA60BD15	TO-247 or D ³
		36	19	14	APT36GA60BD15	TO-247 or D ³
		44	21	17	APT44GA60BD30	TO-247 or D ³
		47	26	20	APT47GA60JD40	ISOTOP®
		54	30	23	APT54GA60BD30	TO-247 or D ³
		60	39	30	APT60GA60JD60	ISOTOP®
		80	48	36	APT80GA60LD40	TO-264
900	2.5	27	25 kHz	50 kHz	APT27GA90BD15	TO-247 or D ³
		35	14	8	APT35GA90BD15	TO-247 or D ³
		43	17	10	APT43GA90BD30	TO-247 or D ³
		46	21	13	APT46GA90JD40	ISOTOP®
		64	29	19	APT64GA90LD30	TO-264
		34	34	23	APT80GA90LD40	TO-264
		23	34	23	APT80GA90LD40	TO-264
FIELD STOP						
SINGLE						
600	1.5	20	15 kHz	30 kHz	APT20GN60KG	TO-220
		24	15	10	APT20GN60BG	TO-247 or D ³
		30	20	14	APT30GN60KG	TO-220
		37	20	14	APT30GN60BG	TO-247 or D ³
		64	30	21	APT50GN60BG	TO-247 or D ³
		93	42	30	APT75GN60BG	TO-247 or D ³
		123	75	47	APT150GN60J	ISOTOP®
		135	54	39	APT100GN60B2G	T-MAX®
		190	79	57	APT150GN60B2G	T-MAX®
		230	103	75	APT200GN60B2G	T-MAX®
1200	1.7	22	10 kHz	20 kHz	APT15GN120KG	TO-220
		33	14	10	APT25GN120BG	TO-247 or D ³
		46	19	13	APT35GN120BG	TO-247 or D ³
		57	24	17	APT75GN120J	ISOTOP®
		66	36	22	APT50GN120B2G	T-MAX®
		70	32	22	APT50GN120B2G	T-MAX®
		99	44	27	APT100GN120J	ISOTOP®
		99	45	30	APT75GN120B2G	T-MAX® or TO-264
		120	58	38	APT100GN120B2G	T-MAX®
		99	60	36	APT150GN120J	ISOTOP®
Combi (IGBT & "DQ" FRED)						
600	1.5	24	15 kHz	30 kHz	APT20GN60BDQ1G	TO-247 or D ³
		37	15	10	APT30GN60BDQ2G	TO-247 or D ³
		64	20	14	APT50GN60BDQ2G	TO-247 or D ³
		93	30	21	APT75GN60LDQ3G	TO-264
		123	42	30	APT150GN60JDQ4	ISOTOP®
		135	75	47	APT100GN60LDQ4G	TO-264
		190	54	39	APT150GN60LDQ4G	TO-264
		158	79	57	APT200GN60JDQ4	ISOTOP®
1200	1.7	22	10 kHz	20 kHz	APT15GN120BDQ1G	TO-247 or D ³
		33	14	10	APT25GN120B2DQ2G	T-MAX®
		46	19	13	APT35GN120L2DQ2G	264-MAX™
		57	24	17	APT75GN120JDQ3	ISOTOP®
		66	36	22	APT50GN120L2DQ2G	264-MAX™
		70	32	22	APT50GN120L2DQ2G	264-MAX™
		99	44	27	APT100GN120JDQ4	ISOTOP®
		99	60	36	APT150GN120JDQ4	ISOTOP®

Current @ Frequency Test Conditions: T_j = 125°C, T_c = 100°C except Isotop® where T_c = 80°C, V_{ce} = 67% rated voltage Hard Switch



TO-220[K]



TO-247[B]

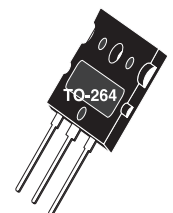


D³ PAK[S]

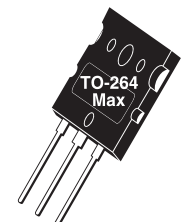
Part Numbers for D³ packages - replace "B" with "S" in part number



T-MAX®[B2]

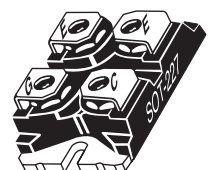


TO-264[L]

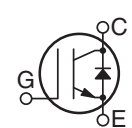


264-MAX™[L2]

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



ISOTOP®[J]
SOT-227



Insulated Gate Bipolar Transistors (IGBTs)

THUNDERBOLT®

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

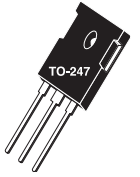
BV _{CES} Volts	V _{CE(ON)} Typ 25°C	I _{C2} 100°C	Recommended Maximum I _C		Part Number	Package Style
			30 kHz	60 kHz		
600	2.0	15	11	8	APT15GT60KRG	TO-220
			14	10	APT20GT60KRG	TO-220
			14	10	APT20GT60BRG	TO-247 or D ³
			19	13	APT30GT60KRG	TO-220
			19	13	APT30GT60BRG	TO-247 or D ³
			25	16	APT40GT60BRG	TO-247 or D ³
			30	20	APT50GT60BRG	TO-247 or D ³
			35	22	APT60GT60BRG	TO-247 or D ³
			29	18	APT60GT60JR	ISOTOP®
			56	35	APT100GT60B2RG	T-MAX® or TO-264
56	33	APT200GT60JR	ISOTOP®			
1200	3.2	18	11	8	APT15GT120BRG	TO-247 or D ³
			16	11	APT25GT120BRG	TO-247 or D ³
			27	17	APT50GT120B2RG	T-MAX® or TO-264
			40	21	APT100GT120JR	ISOTOP®
			52	25	APT150GT120JR	ISOTOP®
Combi (IGBT & "DQ" FRED)			30 kHz	60 kHz		
600	2.0	15	11	8	APT15GT60BRDQ1G	TO-247 or D ³
			14	10	APT20GT60BRDQ1G	TO-247 or D ³
			19	13	APT30GT60BRDQ2G	TO-247 or D ³
			29	18	APT60GT60JRDQ3	ISOTOP®
			30	20	APT50GT60BRDQ2G	TO-247 or D ³
			37	22	APT100GT60JRDQ4	ISOTOP®
			56	35	APT200GT60JRDQ4	ISOTOP®
1200	3.2	18	11	8	APT15GT120BRDQ1G	TO-247 or D ³
			16	11	APT25GT120BRDQ2G	TO-247 or D ³
			27	17	APT50GT120B2RDQ2G	T-MAX® or TO-264
			34	19	APT75GT120JRDQ3	ISOTOP®
			40	21	APT100GT120JRDQ4	ISOTOP®



TO-220[K]



D³ PAK[S]



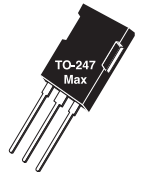
TO-247[B]

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

THUNDERBOLT® HIGH SPEED

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

BV _{CES} Volts	V _{CE(ON)} Typ 25°C	I _{C2} 100°C	Recommended Maximum I _C		Part Number	Package Style
			50 kHz	80 kHz		
600	2.8	20	9	5	APT20GS60KRG	TO-220
			14	9	APT30GS60KRG	TO-220
			23	16	APT50GS60BRG	TO-247 or D ³
Combi (IGBT & "DQ" FRED)			50 kHz	80 kHz		
600	2.8	20	9	5	APT20GS60BRDQ1G	TO-247 or D ³
			14	9	APT30GS60BRDQ2G	TO-247 or D ³
			23	16	APT50GS60BRDQ2G	TO-247 or D ³

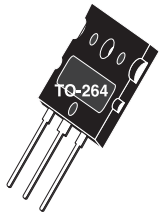


T-MAX®[B2]

FAST

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

BV _{CES} Volts	V _{CE(ON)} Typ 25°C	I _{C2} 100°C	Recommended Maximum I _C		Part Number	Package Style
			15 kHz	30 kHz		
1200	2.5	14	8	5	APT11GF120KRG	TO-220
			11	7	APT20GF120KRG	TO-220
			11	7	APT20GF120BRG	TO-247 or D ³
			16	10	APT33GF120BRG	TO-247 or D ³
			27	17	APT50GF120B2RG	T-MAX®
			27	17	APT50GF120LRG	TO-264
Combi (IGBT & "DQ" FRED)			15 kHz	30 kHz		
1200	2.5	14	8	5	APT11GF120BRDQ1G	TO-247 or D ³
			11	7	APT20GF120BRDQ1G	TO-247 or D ³
			16	10	APT33GF120B2RDQ2G	T-MAX®
			16	10	APT33GF120LRDQ2G	TO-264
			24	15	APT40GF120JRDQ2	ISOTOP®
			33	17	APT50GF120JRDQ3	ISOTOP®
			42	20	APT60GF120JRDQ3	ISOTOP®
Combi (IGBT & "DL" FRED)			50 kHz	80 kHz		
600	2.8	50	23	16	APT50GS60BRDLG	TO-247
			14	9	APT30GS60BRDLG	TO-247
			41	31	APT50GP60LDL	TO-264
			28	22	APT30GP60B2DL	T-MAX® or TO-264
			17	14	APT15GP60BDL	TO-247
			Combi (IGBT & "DL" FRED)			30 kHz
1200	2.0	200	56	33	APT200GT60JRDL	ISOTOP®
			56	35	APT100GT60JRDL	ISOTOP®
			30	20	APT50GT60BRDLG	TO-247
			14	10	APT30GT60BRDLG	TO-247
			Combi (IGBT & "DL" FRED)			20 kHz
1200	3.2	25	16	11	APT25GT120BRDL	TO-247
			28	17	APT50GT120B2RDL	T-MAX®
			40	21	APT100GT120JRDL	ISOTOP®



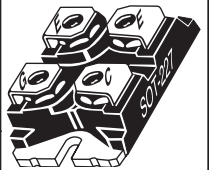
TO-264[L]

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

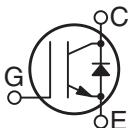
RESONANT MODE COMBI IGBTs

- NPT Technology
- PT Technology
- Low V_F Diode
- Ultrasoft Recovery Diode
- 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
			30 kHz	60 kHz		
600	2.2	50	23	16	APT50GS60BRDLG	TO-247
			14	9	APT30GS60BRDLG	TO-247
			41	31	APT50GP60LDL	TO-264
			28	22	APT30GP60B2DL	T-MAX® or TO-264
			17	14	APT15GP60BDL	TO-247
			Combi (IGBT & "DL" FRED)			30 kHz
1200	2.0	100	56	33	APT200GT60JRDL	ISOTOP®
			56	35	APT100GT60JRDL	ISOTOP®
			30	20	APT50GT60BRDLG	TO-247
			14	10	APT30GT60BRDLG	TO-247
Combi (IGBT & "DL" FRED)			20 kHz	40 kHz		
1200	3.2	25	16	11	APT25GT120BRDL	TO-247
			28	17	APT50GT120B2RDL	T-MAX®
			40	21	APT100GT120JRDL	ISOTOP®



ISOTOP®[J]
SOT-227



Current @ Frequency Test Conditions: T_j = 125°C, T_c = 100°C except Isotop® where T_c = 80°C, V_{cc} = 67% rated voltage Hard Switch

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 2 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.

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

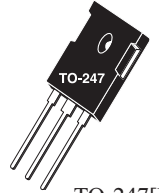
As with previous generation products, Power MOS 8™ MOSFETs and FREDFETs are available in all voltage ratings. A FREDFET is a MOSFET with a faster recovery intrinsic body diode. This results in improved reliability in ZVS circuits due to shorter minority carrier lifetime and increased commutation dv/dt ruggedness. 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	3.80	5	APT4M120K			TO-220
	4.20			4	APT4F120K	TO-220
	2.40			7	APT7F120B	TO-247 or D ³
	2.10	8	APT7M120B			TO-247 or D ³
	1.20			14	APT13F120B	TO-247 or D ³
	1.10	14	APT14M120B			TO-247 or D ³
	0.70			23	APT22F120B2	T-MAX® or TO-264
	0.63	24	APT24M120B2			T-MAX® or TO-264
	0.58			27	APT26F120B2	T-MAX® or TO-264
	0.58			18	APT17F120J	ISOTOP®
	0.53	29	APT28M120B2			T-MAX® or TO-264
	0.53	19	APT19M120J			ISOTOP®
	0.32			33	APT32F120J	ISOTOP®
0.29	35	APT34M120J			ISOTOP®	
1000	2.80			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
	1.60			9	APT9F100B	TO-247 or D ³
	1.40	9	APT9M100B			TO-247 or D ³
	0.98			14	APT14F100B	TO-247 or D ³
	0.88	14	APT14M100B			TO-247 or D ³
	0.78			17	APT17F100B	TO-247 or D ³
	0.70	18	APT18M100B			TO-247 or D ³
	0.44			30	APT29F100B2	T-MAX® or TO-264
	0.44			20	APT19F100J	ISOTOP®
	0.38	32	APT31M100B2	35	APT34F100B2	T-MAX® or TO-264
	0.38	21	APT21M100J	23	APT22F100J	ISOTOP®
	0.33	37	APT37M100B2			T-MAX® or TO-264
	0.33	25	APT25M100J			ISOTOP®
0.20			42	APT41F100J	ISOTOP®	
0.18	45	APT45M100J			ISOTOP®	
800	1.50			7	APT7F80K	TO-220
	1.35	8	APT8M80K			TO-220
	0.90			12	APT11F80B	TO-247 or D ³
	0.80	13	APT12M80B			TO-247 or D ³
	0.58			18	APT17F80B	TO-247 or D ³
	0.53	19	APT18M80B			TO-247 or D ³
	0.43			23	APT22F80B	TO-247 or D ³
	0.39	25	APT24M80B			TO-247 or D ³
	0.24			41	APT38F80B2	T-MAX® or TO-264
	0.21	43	APT41M80B2	47	APT44F80B2	T-MAX® or TO-264
	0.21			31	APT29F80J	ISOTOP®
	0.19	49	APT48M80B2			T-MAX® or TO-264
	0.19	33	APT32M80J			ISOTOP®
	0.11			57	APT53F80J	ISOTOP®
0.10	60	APT58M80J			ISOTOP®	



TO-220[K]



TO-247[B]

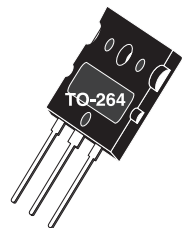


D³ PAK[S]

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

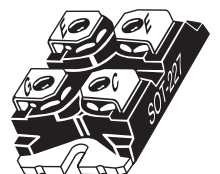


T-MAX®[B2]



TO-264[L]

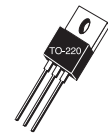
Part Numbers for TO-264 packages - replace "B2" with "L" in part number



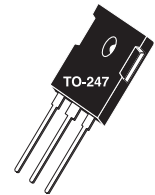
ISOTOP®[J]
SOT-227
(ISOLATED BASE)

Power MOS 8™ MOSFETs / FREDFETs

BV _(DSS) Volts	R _{DS(ON)} Max	I _D	MOSFET Part #	I _D	FREDFET Part #	Package
600	0.62			12	APT12F60K	TO-220
	0.43			16	APT15F60B	TO-247 or D ³
	0.37			19	APT18F60B	TO-247 or D ³
	0.29			24	APT23F60B	TO-247 or D ³
	0.22			30	APT28F60B	TO-247 or D ³
	0.19	36	APT34M60B	36	APT34F60B	TO-247 or D ³
	0.15	45	APT43M60B2	45	APT43F60B2	T-MAX® or TO-264
	0.15	31	APT30M60J	31	APT30F60J	ISOTOP®
	0.11	60	APT56M60B2	60	APT56F60B2	T-MAX® or TO-264
	0.11	42	APT39M60J	42	APT39F60J	ISOTOP®
	0.09	70	APT66M60B2	70	APT66F60B2	T-MAX® or TO-264
	0.09	49	APT47M60J	49	APT47F60J	ISOTOP®
0.055	84	APT80M60J	84	APT80F60J	ISOTOP®	
500	0.39			15	APT15F50K	TO-220
	0.30			20	APT20F50B	TO-247 or D ³
	0.24			24	APT24F50B	TO-247 or D ³
	0.19			30	APT30F50B	TO-247 or D ³
	0.15			37	APT37F50B	TO-247 or D ³
	0.13			43	APT42F50B	TO-247 or D ³
	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®
	0.062	84	APT84M50B2	84	APT84F50B2	T-MAX® or TO-264
	0.062	58	APT58M50J	58	APT58F50J	ISOTOP®
0.036	103	APT100M50J	103	APT100F50J	ISOTOP®	



TO-220[K]



TO-247[B]

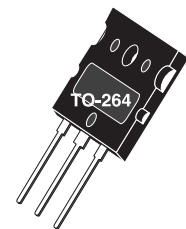


D³ PAK[S]

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

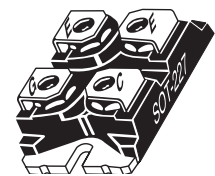


T-MAX®[B2]



TO-264[L]

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



ISOTOP®[J]
SOT-227
(ISOLATED BASE)

Low Voltage Power MOS V® MOSFETs / FREDFETs

300	0.085	40	APT30M85BVRG	40	APT30M85BVFRG	TO-247 or D ³
	0.070	48	APT30M70BVRG	48	APT30M70BVFRG	TO-247 or D ³
	0.040	70	APT30M40JVVRG	70	APT30M40JVFRG	ISOTOP®
	0.019	130	APT30M19JVR	130	APT30M19JVFR	ISOTOP®
200	0.045	56	APT20M45BVRG	56	APT20M45BVFRG	TO-247 or D ³
	0.038	67	APT20M38BVRG	37	APT20M38BVFRG	TO-247 or D ³
	0.022	100	APT20M22B2VVRG	100	APT20M22B2VFRG	T-MAX® or TO-264
	0.011	175	APT20M11JVR	175	APT20M11JVFR	ISOTOP®

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.

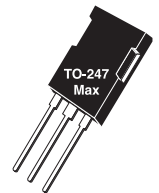
These devices are ideally suited for high frequency and pulsed high voltage applications.

Typical Applications:

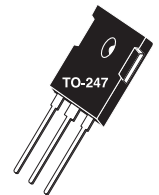
- Class D amplifiers up to 2 MHz
- High voltage pulsed DC
- AM transmitters
- Plasma deposition/etch

FEATURES:	BENEFITS:
<ul style="list-style-type: none"> • Series Gate Resistance (Rg) <0.1 ohm 	<ul style="list-style-type: none"> • Fast switching uniform signal propagation
<ul style="list-style-type: none"> • Tr and Tf times of <10ns 	<ul style="list-style-type: none"> • Pulse power applications
<ul style="list-style-type: none"> • Industry's Lowest Gate Charge 	<ul style="list-style-type: none"> • Fast switching, reduced gate drive power

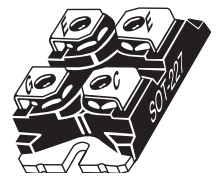
BV _(DSS) Volts	R _{DS(ON)} Max	I _D	MOSFET Part #	Package Style
1200	0.670	18	APT12067B2LLG	T-MAX®
	0.670	17	APT12067JLL	ISOTOP®
	0.570	22	APT12057B2LLG	T-MAX®
	0.570	19	APT12057JLL	ISOTOP®
	0.330	30	APT12031JLL	ISOTOP®
1000	0.460	23	APT10045B2LLG	T-MAX®
	0.460	21	APT10045JLL	ISOTOP®
	0.370	28	APT10035B2LL	T-MAX®
	0.370	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]

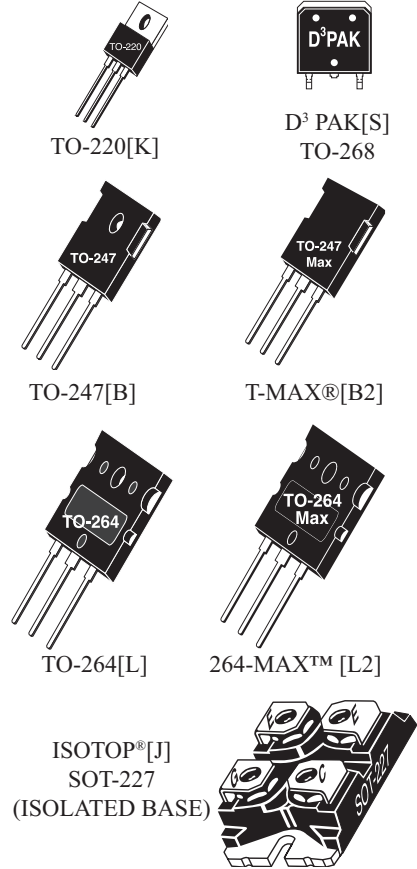


TO-247[B]



ISOTOP®[J]
SOT-227
(ISOLATED BASE)

BV _{DSS} Volts	R _{DS(ON)} Ohms	I _{D(Cont)} Amps	Part Number	Package Style	
C3 TECHNOLOGY					
900	0.120	36	APT36N90BC3G	TO-247	
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®	
650	0.035	94	APT94N65B2C3G	T-MAX®	
	0.070	47	APT47N65BC3G	TO-247	
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	
	SERVER SERIES				
	0.045	60	APT60N60BCSG	TO-247	
	0.042	94	APT94N60L2C3G	264-MAX™	



"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...

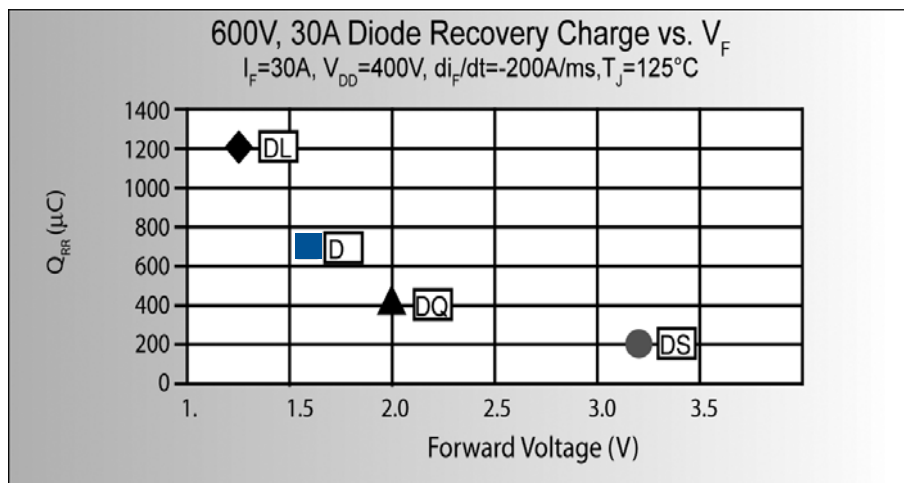
- Active loads above 200 volts such as DC dynamic loads for testing power supplies, batteries, fuel cells, etc.
- High voltage, high current constant current sources.

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					

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.

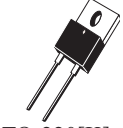

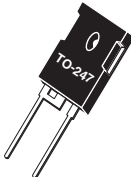

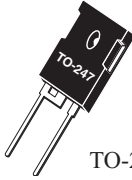
Series	Voltage Ratings	Features	Applications	Comment
NEW! DL	600	Low V_F Ultra-soft recovery Avalanche Rated	Output rectifier Resonant circuits	Ultra-soft recovery minimizes or eliminates snubber
D	200, 300, 400, 600, 1000, 1200	Medium V_F Medium Speed	Freewheeling Diode Output rectifier DC-DC converter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

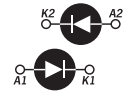
Volts	I_F (avg) Amps	V_F (volts) Typ 25°C	t_{RR} (ns) Typ 25°C	Q_{RR} (nC) Typ 125°C at $I_F = I_F$ (avg)	Diode Series	Part Number	Package Style	
SINGLE	15	2.8	21	960	DQ	APT15DQ120BG	TO-247	 TO-220[K]
1200	15	2.8	21	960	DQ	APT15DQ120KG	TO-220	
	15	2.0	32	1300	D	APT15D120BG	TO-247	
	15	2.0	32	1300	D	APT15D120KG	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		
1000	15	2.5	20	810	DQ	APT15DQ100BG	TO-247	 D³ PAK[S] TO-268
	15	2.5	20	810	DQ	APT15DQ100KG	TO-220	
	15	1.9	28	1550	D	APT15D100KG	TO-220	
	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		
600	8	2.0	14	160	DQ	APT8DQ60KG	TO-220	 TO-247[B]
	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	
	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	 T-MAX®[B2]	
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	
200	15	0.80	20	440	Schottky	APT15S20KG	TO-220	
	30	1.1	21	150	D	APT30D20BG	TO-247	
	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	
								Part Numbers for D³ packages - replace "B" with "S" in part number
TANDEM, DS DIODES FOR PFC BOOST APPLICATIONS								
600	15	3.2	13	85	DS	APT15DS60BG	TO-247	 TO-247[B]
	30	3.2	17	180	DS	APT30DS60BG	TO-247	

(2, 300V Diodes Connected In Series)

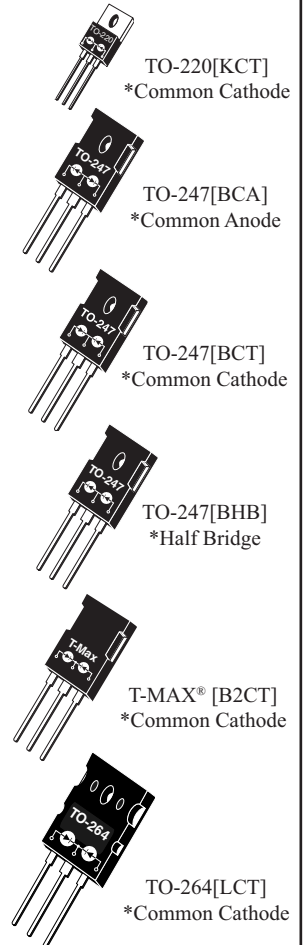
Volts	I _{F(avg)} Amps	V _F (volts) Typ 25°C	t _{RR} (ns) Typ 25°C	Q _{RR} (nC) Typ 125°C at I _F = I _{F(avg)}	Diode Series	Part Number	Package Style
1200	2x27	2.0	31	3450	D	APT2X30D120J	ISOTOP®
	2x30	2.6	25	1800	DQ	APT2X30DQ120J	
	2x53	2.0	38	4000	D	APT2X60D120J	
	2x60	2.5	30	2890	DQ	APT2X60DQ120J	
	2x93	2.0	47	5350	D	APT2X100D120J	
	2x100	2.4	45	5240	DQ	APT2X100DQ120J	
1000	2x28	1.9	29	2350	D	APT2X30D100J	
	2x55	1.9	34	3600	D	APT2X60D100J	
	2x60	2.2	30	2350	DQ	APT2X60DQ100J	
	2x95	1.9	43	4050	D	APT2X100D100J	
	2x100	2.1	45	3645	DQ	APT2X100DQ100J	
600	2x30	1.8	20	400	DQ	APT2X30DQ60J	
	2x30	1.6	23	700	D	APT2X30D60J	
	2x60	1.7	27	650	DQ	APT2X60DQ60J	
	2x60	1.6	40	920	D	APT2X60D60J	
	2x100	1.6	30	980	DQ	APT2X100DQ60J	
	2x100	1.6	34	1450	D	APT2X100D60J	
400	2x150	1.25	53	3800	DL	APT2X150DL60J	
	2x30	1.3	22	360	D	APT2X30D40J	
	2x60	1.3	30	540	D	APT2X60D40J	
	2x100	1.3	37	1050	D	APT2X100D40J	
200	2x100	1.0	40	3550	DL	APT2X101DL40J ⁺⁺	
	2x30	0.80	25	448	Schottky	APT2X31S20J	
	2x60	0.83	35	490	Schottky	APT2X61S20J	
	2x100	1.1	39	840	D	APT2X100D20J	
1000	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]
	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]
600	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]
	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]
200	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]
	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



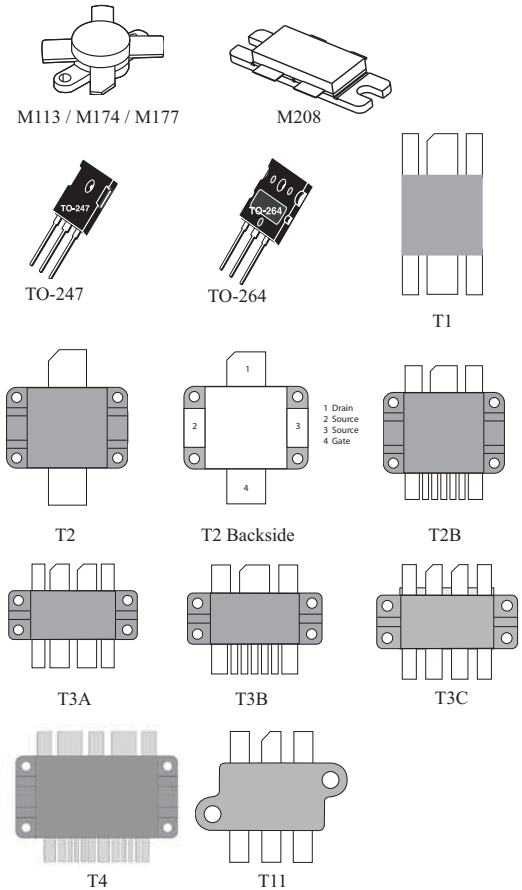
*Current ratings per leg ++ Parallel Form Only

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)	θ_{JC} ($^{\circ}C/W$)	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	125V/500V	0.15	T11	ARF300	E
	45	-125V/-500V	0.15	T11	ARF301	E
	45	200V/1kV	0.35	TO-264	ARF466AG/BG	A-E
	45	200V/1kV	0.27	T3	ARF466FL	A-E
	45	200V/1kV	0.27	T3	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)	θ_{JC} ($^{\circ}C/W$)	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

High Frequency RF MOSFETs

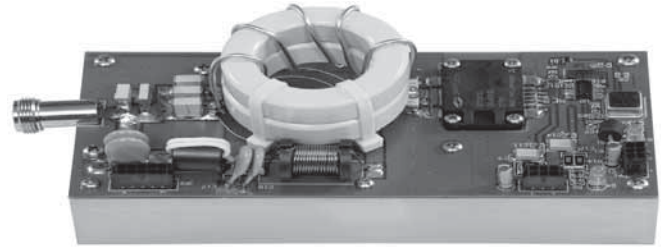
The VRF family of RF MOSFETs are improved replacements for industry standard RF transistors. They provide improved ruggedness by increasing the BV_{DSS} over 30% from the industry standard of 125 volts to 170V minimum. Low cost flangeless packages - Microsemi is dedicated to optimizing the performance, 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)	Freq. (MHz)	Gain Typ (dB)	η Typ (%)	V_{DD}/BV_{DSS} (V)	Coss Type (pF)	VSWR Load	θ_{JC} ($^{\circ}C/W$)	Case Style	Part Number
150	175	13	45	28V/80V	375	30:1	0.60	M174	VRF141
30	175	16	50	50V/170V	40	30:1	1.52	M113	VRF148A
150	150	11	50	50V/170V	210	30:1	0.60	M174	VRF150
150	175	14	50	50V/170V	200	30:1	0.60	M174	VRF151
300	175	16	55	50V/170V	200	5:1	0.35	M208	VRF151G
150	175	14	50	50V/130V	215	30:1	0.60	M174	VRF152
600	30	17	45	50V/170V	775	-	0.13	T2	VRF154FL
600	30	21	45	50V/170V	810	-	0.13	T2	VRF157FL
150	150	22	50	100V/270V	80	5:1	0.40	T11	VRF191
300	30	21	50	50V/170V	400	3:1	0.27	M177	VRF2933

Reference Design Kits

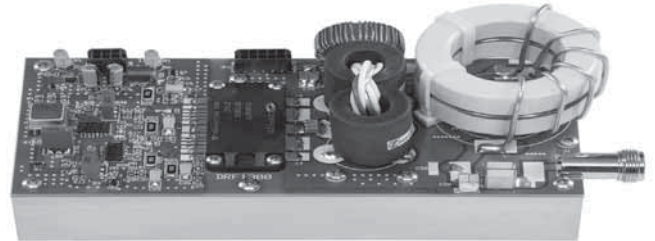
DRF1200/CLASS-E

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



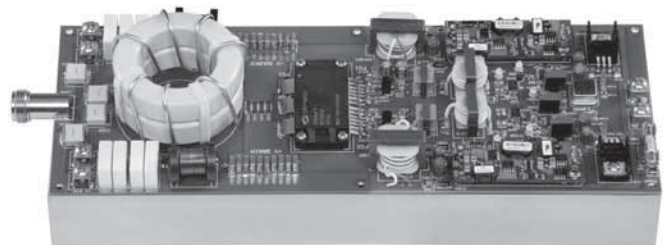
DRF1300/CLASS-D

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

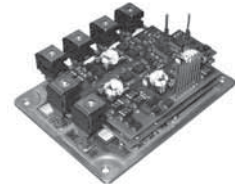


All kits include: A fully populated board attached to an aluminum heat sink. An extensive application note explaining the theory of operation with designers recommendations for evaluation and board layout. All key waveforms are illustrated and described. A complete parts list with recommended vendor 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	GL	475	A	120	T	D3	G
I	II	III	IV	V	VI	VII	VIII

- I Trade Mark**
- II IGBT Type:**
 GF = NPT
 GL = TRENCH 4
 GT = TRENCH
 GV = Mix NPT/TRENCH
 CV = Mix TRENCH/CoolMOS
- III Current:**
 Ic @ Tc=80°C
- IV Topology:**
 A = Phase Leg
 DA = Boost Chopper
 DDA = Double Boost Chopper
 DH = Asymmetrical Bridge
 DSK = Double Buck Chopper
 DU = Dual Common Source
 H = Full Bridge
 SK = Buck Chopper
 TA = Triple Phase Leg
 TDU = Triple Dual Common Source
 TL = Three Level
 U = Single Switch
 X = Three Phase Bridge
- V Blocking Voltage:**
 60 = 600V
 120 = 1200V
 170 = 1700V
- VI Option:**
 D = Series Diode
 T = Temperature Sensor
 W = Clamping Parallel Diode
- VII Package:**
 1 = SP1
 3 = SP3
 P = SP6-P
 D1 = D1 (34mm)
 D3 = D3 (62mm)
 D4 = D4 (62mm)
- VIII G = RoHS Compliant**

MOSFET Modules

APT	C	60	DA	M24	T	1	G
I	II	III	IV	V	VI	VII	VIII

- I Trade Mark**
- II MOSFET Type:**
 M = MOSFET
 C = CoolMOS
- III Blocking Voltage:**
 08 = 75V
 10 = 100V
 20 = 200V
 50 = 500V
 60 = 600V
 80 = 800V
 90 = 900V
 100 = 100V
 120 = 120V
- IV Topology:**
 A = Phase Leg
 DA = Boost Chopper
 DDA = Double Boost Chopper
 DH = Asymmetrical Bridge
 DSK = Double Buck Chopper
 DU = Dual Common Source
 H = Full Bridge
 SK = Buck Chopper
 TA = Triple Phase Leg
 TDU = Triple Dual Common Source
 U = Single Switch
- V RDS(on) @ Tc=25°C**
 240 = 2400mΩ
 24 = 240mΩ
 M24 = 24mΩ
- VI Option:**
 A = AlN Substrate
 C = SiC Diode
 D = Series Diode
 F = FREDFET
 S = Series and Parallel Diodes
 T = Temperature Sensor
 U = Ultrafast FREDFET
- VII Package:**
 1 = SP1
 3 = SP3
 P = SP6-P
- VIII G = RoHS Compliant**

Diode Modules

APT	DR	90	X	160	1	G
I	II	III	IV	V	VI	VII

- I Trade Mark**
- II Diode Type:**
 DF = FRED
 DR = Standard Rectifier
 DC = SiC
 DSK = Schottky
- III Current:**
 IF @ Tc=80°C
- IV Topology:**
 AA = Dual Common Anode
 AK = Dual Series
 H = Single Phase Bridge
 U = Single Switch
 X = Three Phase Bridge
- V Blocking Voltage:**
 20 = 200V
 40 = 400V
 60 = 600V
 100 = 1000V
 120 = 1200V
 160 = 1600V
 170 = 1700V
- VI Package:**
 1 = SP1
 3 = SP3
- VII G = RoHS Compliant**

Optional Materials

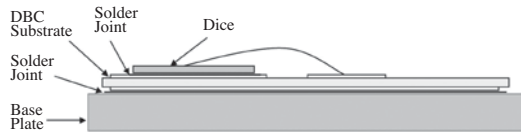
Optional materials are available upon demand on most of the listed standard power modules. Options are indicated with a letter in the suffix of the module part number. Temperature Sensor Option is indicated in the catalog with "YES" or "option" when available on standard part or on demand.

- A** AlN Substrate for higher thermal conductivity
- M** AlSiC Base plate material for improved temperature cycling capabilities
- T** Temperature Sensor (NTC or PTC) for Case Temperature information
- C** SiC Diode for higher efficiency

PERFORMANCE & THERMAL MANAGEMENT

While the choice of power semiconductors play a key role in power conversion applications, the increased demand for higher power density and assembly reliability become the objective to keep the leadership on the market place.

With 26 years experience in power module industry Microsemi develops and manufactures power modules with mix and match components and assembly materials to offer the best trade off between cost, size, performance and reliability. Microsemi has the right expertise to address your application.



	CTE (ppm/K)	Thermal conductivity (W/m.K)	Rthjc (K/W)
Silicon Die (120 mm2)	4	136	
Cu/Al ₂ O ₃	17/7	390/25	0.35
AlSiC/Al ₂ O ₃	7/7	170/25	0.38
Cu/AlN	17/5	390/170	0.28
AlSiC/AlN	7/5	170/170	0.31
AlSiC/Si ₃ N ₄	7/3	170/60	0.31

	Material	CTE (ppm/K)	Thermal conductivity (W/m.K)	Density (g/cc)
Base plate	CuW	6.5	190	17
	AlSiC	7	170	2.9
	Cu	17	390	8.9
Substrate	Al ₂ O ₃	7	25	-
	AlN	5	170	-
	Si ₃ N ₄	3	60	-
Die	Si	4	136	-
	SiC	2.6	270	-

The choice of materials determines power module performance and reliability:

- Using materials with more closely matched values of Thermal Coefficient Expansion (TCE) increases module lifetime
- Higher thermal conductivity maximizes thermal performance

Improved Low Profile Packages

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

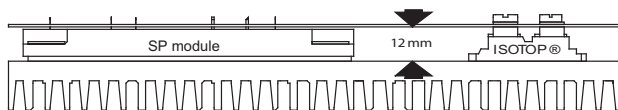


Industry Standard Packages

- SOT-227 (Isotop[®])
- 34mm & 62mm Types
- D1 (34 mm Wide)
- D3 (62 mm Wide)
- D4 (62 mm Wide)



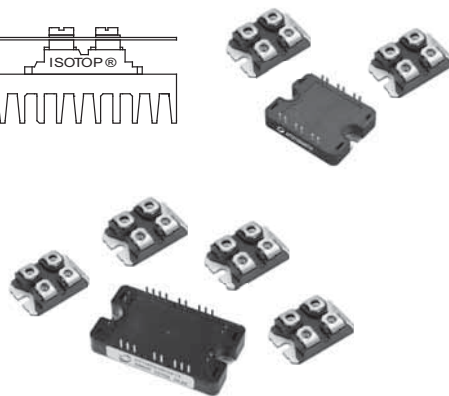
Package Advantages



- 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



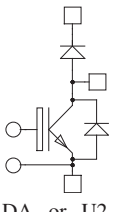
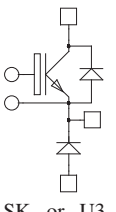
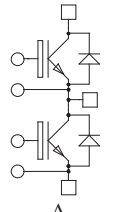
- SP6-P package:
- Replaces up to 6 SOT-227 parts
 - Height compatible with SOT-227 package
 - Low inductance solder pins
 - High current capability

IGBT Power Modules

CHOPPER AND PHASE LEG

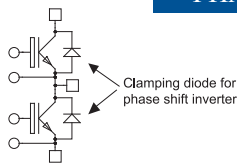
V_{CES} (V)	IGBT type	I_C (A) $T_c=80^\circ\text{C}$	$V_{CE(ON)}$ (V) at rated I_C	Package	NTC				
600	NPT	30	2.1	SOT227	-	APT30GF60JU2	APT30GF60JU3	N/A	
		30	2.1	SP1	YES	N/A	N/A	APTGF30A60T1G	
		50	2.1	SOT227	-	APT50GF60JU2	APT50GF60JU3	N/A	
		50	2.1	SP1	YES	N/A	N/A	APTGF50A60T1G	
		60	2.1	SOT227	-	APT60GF60JU2	APT60GF60JU3	N/A	
		90	2.1	SP1	YES	APTGF90DA60T1G	APTGF90SK60T1G	APTGF90A60T1G	
		90	2.1	SP3	YES	APTGF90DA60T3AG	APTGF90SK60T3AG	APTGF90A60T3AG	NEW!
		100	2.1	SOT227	-	APT100GF60JU2	APT100GF60JU3	N/A	
		150	2.1	SP3	YES	N/A	N/A	APTGF150A60T3AG	NEW!
		165	2.1	D1	-	APTGF165DA60D1G	APTGF165SK60D1G	APTGF165A60D1G	
	TRENCH	180	2.1	SP4	YES	APTGF180DA60TG	APTGF180SK60TG	APTGF180A60TG	
		250	2.1	D3	option	APTGF250DA60D3G	APTGF250SK60D3G	APTGF250A60D3G	NEW!
		330	2.1	D3	option	APTGF330DA60D3G	APTGF330SK60D3G	APTGF330A60D3G	
		350	2.1	SP6	option	APTGF350DA60G	APTGF350SK60G	APTGF350A60G	
		20	1.5	SP1	YES	N/A	N/A	APTGT20A60T1G	
		30	1.5	SP1	YES	N/A	N/A	APTGT30A60T1G	
		50	1.5	SP1	YES	N/A	N/A	APTGT50A60T1G	
		75	1.5	SP1	YES	APTGT75DA60T1G	APTGT75SK60T1G	APTGT75A60T1G	
		100	1.5	SP1	YES	APTGT100DA60T1G	APTGT100SK60T1G	APTGT100A60T1G	
		100	1.5	SP3	YES	APTGT100DA60T3AG	APTGT100SK60T3AG	APTGT100A60T3AG	NEW!
1200	NPT	15	3.2	SP1	YES	N/A	N/A	APTGF15A120T1G	
		25	3.2	SP1	YES	N/A	N/A	APTGF25A120T1G	
		50	3.2	SP1	YES	APTGF50DA120T1G	APTGF50SK120T1G	APTGF50A120T1G	
		75	3.2	SP1	YES	APTGF75DA120T1G	N/A	N/A	
		100	3.2	SP1	YES	APTGF100DA120T1G	N/A	N/A	
		100	3.2	SP3	YES	N/A	N/A	APTGF100A120T3AG	NEW!
		100	3.2	SP4	YES	APTGF100DA120TG	APTGF100SK120TG	APTGF100A120TG	
		150	3.2	SP4	YES	APTGF150DA120TG	APTGF150SK120TG	APTGF150A120TG	
	TRENCH	200	3.2	D3	option	APTGF200DA120D3G	APTGF200SK120D3G	APTGF200A120D3G	NEW!
		300	3.2	SP6	option	APTGF300DA120G	APTGF300SK120G	APTGF300A120G	
1200	TRENCH	25	1.7	SP1	YES	N/A	N/A	APTGT25A120T1G	
		35	1.7	SP1	YES	N/A	N/A	APTGT35A120T1G	
		35	1.7	SOT227	-	APT35GT120JU2	APT35GT120JU3	N/A	
		50	1.7	SOT227	-	APT50GT120JU2	APT50GT120JU3	N/A	
		50	1.7	SP1	YES	N/A	N/A	APTGT50A120T1G	
		50	1.7	SP4	YES	APTGT50DA120TG	APTGT50SK120TG	APTGT50A120TG	
		75	1.7	SOT227	-	APT75GT120JU2	APT75GT120JU3	N/A	
		75	1.7	SP1	YES	APTGT75DA120T1G	APTGT75SK120T1G	APTGT75A120T1G	
		75	1.7	SP4	YES	APTGT75DA120TG	APTGT75SK120TG	APTGT75A120TG	
		100	1.7	SP1	YES	APTGT100DA120T1G	N/A	N/A	
		100	1.7	SOT227	-	APT100GT120JU2	APT100GT120JU3	N/A	
		100	1.7	D1	-	APTGT100DA120D1G	APTGT100SK120D1G	APTGT100A120D1G	
		100	1.7	SP3	YES	N/A	N/A	APTGT100A120T3AG	NEW!
		100	1.7	SP4	YES	APTGT100DA120TG	APTGT100SK120TG	APTGT100A120TG	
		150	1.7	SP6	option	APTGT150DA120G	APTGT150SK120G	APTGT150A120G	
150	1.7	D1	-	APTGT150DA120D1G	APTGT150SK120D1G	APTGT150A120D1G			
150	1.7	SP3	YES	N/A	N/A	APTGT150A120T3AG	NEW!		

CHOPPER AND PHASE LEG CONT.

V_{CES} (V)	IGBT type	I_C (A) $T_C=80^\circ\text{C}$	$V_{CE(on)}$ (V) at rated I_C	Package	NTC	 DA...or...U2	 SK...or...U3	 ...A...
1200	TRENCH	150	1.7	SP4	YES	APTGT150DA120TG	APTGT150SK120TG	APTGT150A120TG
		200	1.7	SP6	option	APTGT200DA120G	APTGT200SK120G	APTGT200A120G
		200	1.7	D3	option	APTGT200DA120D3G	APTGT200SK120D3G	APTGT200A120D3G
		300	1.7	SP6	option	APTGT300DA120G	APTGT300SK120G	APTGT300A120G
		300	1.7	D3	option	APTGT300DA120D3G	APTGT300SK120D3G	APTGT300A120D3G
		400	1.7	SP6	option	APTGT400DA120G	APTGT400SK120G	APTGT400A120G
	TRENCH4	400	1.7	D3	option	APTGT400DA120D3G	APTGT400SK120D3G	APTGT400A120D3G
		40	1.85	SOT227	-	APT40GL120JU2	APT40GL120JU3	N/A
		60	1.85	SOT227	-	APT60GL120JU2	APT60GL120JU3	N/A
		60	1.85	SP1	YES	N/A	N/A	APTGL60A120T1G
		90	1.85	SP1	YES	APTGL90DA120T1G	APTGL90SK120T1G	APTGL90A120T1G
		120	1.85	SP1	YES	APTGL120DA120T1G	APTGL120SK120T1G	N/A
		180	1.85	SP3	YES	N/A	N/A	APTGL180A120T3AG
		325	1.85	D3	option	APTGL325DA120D3G	APTGL325SK120D3G	APTGL325A120D3G
1700	TRENCH	475	1.85	D3	option	APTGL475DA120D3G	APTGL475SK120D3G	APTGL475A120D3G
		30	2.0	SP1	YES	APTGT30DA170T1G	APTGT30SK170T1G	APTGT30A170T1G
		50	2.0	SP1	YES	APTGT50DA170T1G	APTGT50SK170T1G	APTGT50A170T1G
		50	2.0	SP4	YES	APTGT50DA170TG	APTGT50SK170TG	APTGT50A170TG
		75	2.0	SP1	YES	APTGT75DA170T1G	N/A	N/A
		75	2.0	D1	-	APTGT75DA170D1G	APTGT75SK170D1G	APTGT75A170D1G
		100	2.0	SP4	YES	APTGT100DA170TG	APTGT100SK170TG	APTGT100A170TG
		150	2.0	SP6	option	APTGT150DA170G	APTGT150SK170G	APTGT150A170G
		150	2.0	D3	option	APTGT150DA170D3G	APTGT150SK170D3G	APTGT150A170D3G
		200	2.0	D3	option	APTGT200DA170D3G	APTGT200SK170D3G	APTGT200A170D3G
		225	2.0	SP6	option	APTGT225DA170G	APTGT225SK170G	APTGT225A170G
		300	2.0	SP6	option	APTGT300DA170G	APTGT300SK170G	APTGT300A170G
		300	2.0	D3	option	APTGT300DA170D3G	APTGT300SK170D3G	APTGT300A170D3G



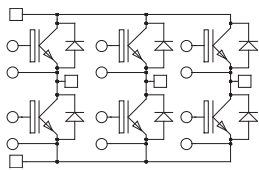
PHASE LEG for welding application



V_{CES} (V)	IGBT Type	I_C (A) $T_C=80^\circ\text{C}$	$V_{CE(ON)}$ at rated I_C	Package	NTC	Part Number
1200	NPT	50	3.2	SP3	YES	APTGF50A120T3WG
		100	3.2	SP3	YES	APTGF100A120T3WG
		150	3.2	SP3	YES	APTGF150A120T3WG

NEW!

3 PHASE BRIDGE

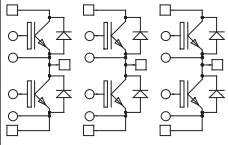


V_{CES} (V)	IGBT Type	I_C (A) $T_C=80^\circ\text{C}$	$V_{CE(ON)}$ at rated I_C	Package	NTC	Part Number
600	NPT	30	2.1	SP3	YES	APTGF30X60T3G
		50	2.1	SP3	YES	APTGF50X60T3G
	TRENCH	20	1.5	SP3	YES	APTGT20X60T3G
		30	1.5	SP3	YES	APTGT30X60T3G
		50	1.5	SP3	YES	APTGT50X60T3G
		75	1.5	SP3	YES	APTGT75X60T3G
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
		30	1.85	SP3	YES	APTGL30X120T3G
		40	1.85	SP3	YES	APTGL40X120T3G

NEW!

IGBT Power Modules

TRIPLE PHASE LEG

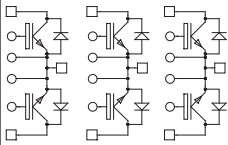


V_{CES} (V)	IGBT Type	I_C (A) $T_C=80^\circ\text{C}$	$V_{CE(ON)}$ at rated I_C	Package	NTC	Part Number
600	NPT	90	2.1	SP6-P	option	APTGF90TA60PG
	TRENCH	50	1.5	SP6-P	option	APTGT50TA60PG
		75	1.5	SP6-P	option	APTGT75TA60PG
		100	1.5	SP6-P	option	APTGT100TA60PG
		150	1.5	SP6-P	option	APTGT150TA60PG
1200	NPT	50	3.2	SP6-P	option	APTGF50TA120PG
	TRENCH	75	1.7	SP6-P	option	APTGT75TA120PG
		100	1.7	SP6-P	YES	APTGT100TA120TPG
	TRENCH4	120	1.85	SP6-P	YES	APTGL120TA120TPG
1700	TRENCH	50	2.0	SP6-P	option	APTGT50TA170PG



NEW!

TRIPLE DUAL COMMON SOURCE



V_{CES} (V)	IGBT Type	I_C (A) $T_C=80^\circ\text{C}$	$V_{CE(ON)}$ at rated I_C	Package	NTC	Part Number
600	NPT	90	2.1	SP6-P	option	APTGF90TDU60PG
	TRENCH	50	1.5	SP6-P	option	APTGT50TDU60PG
		75	1.5	SP6-P	option	APTGT75TDU60PG
		100	1.5	SP6-P	option	APTGT100TDU60PG
		150	1.5	SP6-P	option	APTGT150TDU60PG
1200	NPT	50	3.2	SP6-P	option	APTGF50TDU120PG
	TRENCH	75	1.7	SP6-P	option	APTGT75TDU120PG
		100	1.7	SP6-P	YES	APTGT100TDU120TPG
	TRENCH4	120	1.85	SP6-P	YES	APTGL120TDU120TPG
1700	TRENCH	50	2.0	SP6-P	option	APTGT50TDU170PG



NEW!



DUAL CHOPPER

V_{CES} (V)	IGBT type	I_C (A) $T_C=80^\circ\text{C}$	$V_{CE(on)}$ at rated I_C	Package	NTC	...DDA...	...DSK...
600	NPT	50	2.1	SP3	YES	APTGF50DDA60T3G	APTGF50DSK60T3G
	TRENCH	90	2.1	SP3	YES	APTGF90DDA60T3G	APTGF90DSK60T3G
		20	1.5	SP3	YES	APTGT20DDA60T3G	APTGT20DSK60T3G
		30	1.5	SP3	YES	APTGT30DDA60T3G	APTGT30DSK60T3G
		50	1.5	SP3	YES	APTGT50DDA60T3G	APTGT50DSK60T3G
		75	1.5	SP3	YES	APTGT75DDA60T3G	APTGT75DSK60T3G
100	1.5	SP3	YES	APTGT100DDA60T3G	APTGT100DSK60T3G		
1200	NPT	25	3.2	SP3	YES	APTGF25DDA120T3G	APTGF25DSK120T3G
		50	3.2	SP3	YES	APTGF50DDA120T3G	APTGF50DSK120T3G
		75	3.2	SP4	YES	APTGF75DDA120T3G	APTGF75DSK120T3G
	TRENCH	50	1.7	SP3	YES	APTGT50DDA120T3G	APTGT50DSK120T3G
		60	1.85	SP3	YES	APTGL60DDA120T3G	APTGL60DSK120T3G
	TRENCH4	90	1.85	SP3	YES	APTGL90DDA120T3G	APTGL90DSK120T3G

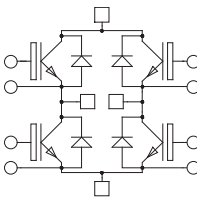
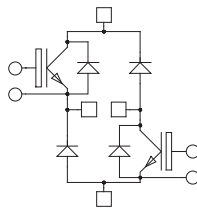
NEW!

NEW!

NEW!



FULL & ASYMMETRICAL BRIDGE

V_{CES} (V)	IGBT type	I_c (A) $T_c=80^\circ\text{C}$	$V_{CE(on)}$ at rated I_c	Package	NTC	 ...H...	 ...DH...	
600	NPT	30	2.1	SP1	YES	APTGF30H60T1G	N/A	
		50	2.1	SP1	YES	APTGF50H60T1G	APTGF50DH60T1G	NEW!
		30	2.1	SP3	YES	APTGF30H60T3G	N/A	
		50	2.1	SP3	YES	APTGF50H60T3G	N/A	
		90	2.1	SP3	YES	APTGF90H60T3G	APTGF90DH60T3G	NEW!
		180	2.1	SP6	-	APTGF180H60G	APTGF180DH60G	
	TRENCH	20	1.5	SP1	YES	APTGT20H60T1G	N/A	
		20	1.5	SP3	YES	APTGT20H60T3G	N/A	
		30	1.5	SP1	YES	APTGT30H60T1G	N/A	
		30	1.5	SP3	YES	APTGT30H60T3G	N/A	
		50	1.5	SP1	YES	APTGT50H60T1G	APTGT50DH60T1G	NEW!
		50	1.5	SP3	YES	APTGT50H60T3G	N/A	
		75	1.5	SP1	YES	APTGT75H60T1G	APTGT75DH60T1G	NEW!
		75	1.5	SP3	YES	APTGT75H60T3G	APTGT75DH60T3G	
		100	1.5	SP4	YES	APTGT100H60TG	APTGT100DH60TG	
		100	1.5	SP3	YES	APTGT100H60T3G	APTGT100DH60T3G	NEW!
		150	1.5	SP4	YES	APTGT150H60TG	APTGT150DH60TG	
		200	1.5	SP6	-	APTGT200H60G	APTGT200DH60G	
300	1.5	SP6	-	APTGT300H60G	APTGT300DH60G			
1200	NPT	15	3.2	SP1	YES	APTGF15H120T1G	N/A	
		15	3.2	SP3	YES	APTGF15H120T3G	N/A	
		25	3.2	SP1	YES	APTGF25H120T1G	N/A	
		25	3.2	SP3	YES	APTGF25H120T3G	N/A	
		50	3.2	SP3	YES	N/A	APTGF50DH120T3G	NEW!
		50	3.2	SP4	YES	APTGF50H120TG	APTGF50DH120TG	
		75	3.2	SP3	YES	N/A	APTGF75DH120T3G	NEW!
		75	3.2	SP4	YES	APTGF75H120TG	APTGF75DH120TG	
		150	3.2	SP6	-	APTGF150H120G	APTGF150DH120G	
		TRENCH	25	1.7	SP1	YES	APTGT25H120T1G	N/A
	35		1.7	SP1	YES	APTGT35H120T1G	N/A	
	35		1.7	SP3	YES	APTGT35H120T3G	N/A	
	50		1.7	SP3	YES	N/A	APTGT50DH120T3G	NEW!
	50		1.7	SP4	YES	APTGT50H120TG	APTGT50DH120TG	
	50		1.7	SP3	YES	APTGT50H120T3G	N/A	
	75		1.7	SP3	YES	N/A	APTGT75DH120T3G	NEW!
	75		1.7	SP4	YES	APTGT75H120TG	APTGT75DH120TG	
	100		1.7	SP4	YES	N/A	APTGT100DH120TG	
	100		1.7	SP6	-	APTGT100H120G	N/A	
	150		1.7	SP6	-	APTGT150H120G	APTGT150DH120G	
	200		1.7	SP6	-	APTGT200H120G	APTGT200DH120G	
	TRENCH4		30	1.85	SP1	YES	APTGL30H120T1G	N/A
			40	1.85	SP1	YES	APTGL40H120T1G	N/A
		60	1.85	SP3	YES	APTGL60H120T3G	APTGL60DH120T3G	
90		1.85	SP3	YES	APTGL90H120T3G	APTGL90DH120T3G		
1700	TRENCH	30	2.0	SP3	YES	APTGT30H170T3G	N/A	
		50	2.0	SP4	YES	APTGT50H170TG	APTGT50DH170TG	
		100	2.0	SP6	-	APTGT100H170G	APTGT100DH170G	
		150	2.0	SP6	-	APTGT150H170G	APTGT150DH170G	



SP1



SP3



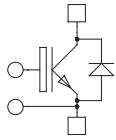
SP4



SP6 FullBridge

IGBT Power Modules

SINGLE SWITCH



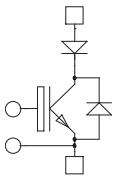
V _{CES} (V)	IGBT Type	I _C (A) T _C =80° C	V _{CE(ON)} at rated I _C	Package Style	NTC	Part Number
600	NPT	360	2.0	D4	-	APTGF360U60D4G
		500	2.0	D4	-	APTGF500U60D4G
		660	2.0	D4	-	APTGF660U60D4G
	TRENCH	580	1.5	D4	-	APTGT580U60D4G
		750	1.5	D4	-	APTGT750U60D4G
1200	NPT	400	3.2	D4	-	APTGF400U120D4G
		530	3.2	D4	-	APTGF530U120D4G
	TRENCH	400	1.7	D4	-	APTGT400U120D4G
		600	1.7	D4	-	APTGT600U120D4G
	TRENCH4	475	1.85	D4	-	APTGL475U120D4G
		700	1.85	D4	-	APTGL700U120D4G
1700	TRENCH	200	2.0	D4	-	APTGT200U170D4G
		300	2.0	D4	-	APTGT300U170D4G
		400	2.0	D4	-	APTGT400U170D4G
		600	2.0	D4	-	APTGT600U170D4G



D4

NEW!

SINGLE SWITCH + SERIES DIODE



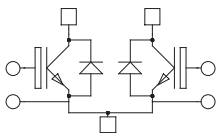
V _{CES} (V)	IGBT Type	I _C (A) T _C =80° C	V _{CE(ON)} at rated I _C	Package Style	NTC	Part Number
1200	NPT	200	3.2	SP6	-	APTGF200U120DG
		300	3.2	SP6	-	APTGF300U120DG
	TRENCH4	475	1.85	SP6	-	APTGL475U120DAG



SP4

NEW!

DUAL COMMON SOURCE

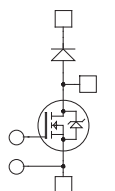
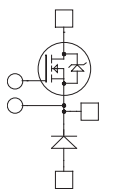


V _{CES} (V)	IGBT Type	I _C (A) T _C =80° C	V _{CE(ON)} at rated I _C	Package Style	NTC	Part Number
600	NPT	90	2.1	SP4	YES	APTGF90DU60TG
		180	2.1	SP4	YES	APTGF180DU60TG
		350	2.1	SP6	-	APTGF350DU60G
	TRENCH	100	1.5	SP4	YES	APTGT100DU60TG
		150	1.5	SP4	YES	APTGT150DU60TG
		200	1.5	SP4	YES	APTGT200DU60TG
		300	1.4	SP6	-	APTGT300DU60G
		450	1.4	SP6	-	APTGT450DU60G
		600	1.4	SP6	-	APTGT600DU60G
		1200	NPT	50	3.2	SP4
100	3.2			SP4	YES	APTGF100DU120TG
150	3.2			SP4	YES	APTGF150DU120TG
300	3.2			SP6	-	APTGF300DU120G
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
1700	TRENCH	300	1.7	SP6	-	APTGT300DU120G
		400	1.7	SP6	-	APTGT400DU120G
		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		



SP6

CHOPPER

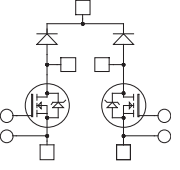
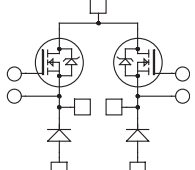
V_{DSS} (V)	MOSFET type	$R_{DS(ON)}$ (m Ω)	I_D (A) $T_c=80^\circ\text{C}$	Package	NTC	 DA...or...U2	 SK...or...U3
100	MOS 5	11	100	SOT227	-	APT10M11JVRU2	APT10M11JVRU3
		4.5	207	SP4	YES	APTM10DAM05TG	APTM10SKM05TG
		2.25	370	SP6	-	APTM10DAM02G	APTM10SKM02G
200	MOS 5	22	71	SOT227	-	APT20M22JVRU2	APT20M22JVRU3
	MOS 7	10	125	SP4	YES	APTM20DAM10TG	APTM20SKM10TG
		8	147	SP4	YES	APTM20DAM08TG	APTM20SKM08TG
		5	250	SP6	option	APTM20DAM05G	APTM20SKM05G
		4	300	SP6	option	APTM20DAM04G	APTM20SKM04G
500	MOS 5	100	30	SOT227	-	APT5010JVRU2	APT5010JVRU3
	MOS 7	100	30	SOT227	-	APT5010JLLU2	APT5010JLLU3
		75	32	SOT227	-	APT50M75JLLU2	APT50M75JLLU3
		38	64	SP4	YES	APTM50DAM38TG	APTM50SKM38TG
		35	70	SP4	YES	APTM50DAM35TG	APTM50SKM35TG
		19	125	SP6	option	APTM50DAM19G	APTM50SKM19G
	17	140	SP6	option	APTM50DAM17G	APTM50SKM17G	
MOS 8	65	43	SOT227	-	APT58M50JU2	APT58M50JU3	
600	COOLMOS	45	38	SOT227	-	APT50N60JCU2	APT50N60JCU3
		70	40	SOT227	-	APT40N60JCU2	APT40N60JCU3
		35	54	SP1	YES	APTC60DAM35T1G	APTC60SKM35T1G
		24	70	SP1	YES	APTC60DAM24T1G	APTC60SKM24T1G
800	COOLMOS	150	21	SP1	YES	APTC80DA15T1G	APTC80SK15T1G
900	COOLMOS	120	25	SOT227	-	APT33N90JCU2	APT33N90JCU3
		60	44	SP1	YES	APTC90DAM60T1G	APTC90DSKM60T1G
1000	MOS 7	180	33	SP4	YES	APTM100DA18TG	APTM100SK18TG
		90	59	SP6	option	APTM100DAM90G	APTM100SKM90G
	MOS 8	400	15	SP1	YES	APTM100DA40T1G	APTM100SK40T1G
		330	17	SP1	YES	APTM100DA33T1G	APTM100SK33T1G
		180	30	SP1	YES	APTM100DA18T1G	N/A
90	59	SP6	option	APTM100DAM90G	N/A		
1200	MOS 7	290	25	SP4	YES	APTM120DA29TG	APTM120SK29TG
		150	45	SP6	option	APTM120DA15G	APTM120SK15G
	MOS 8	680	11	SP1	YES	APTM120DA68T1G	APTM120SK68T1G
		560	13	SP1	YES	APTM120DA56T1G	APTM120SK56T1G
		300	23	SP1	YES	APTM120DA30T1G	N/A



NEW!
NEW!

NEW!

DUAL CHOPPER

V_{DSS} (V)	MOSFET type	$R_{DS(ON)}$ (m Ω)	I_D (A) $T_c=80^\circ\text{C}$	Package	NTC	 ...DDA...	 ...DSK...
100	MOS 5	19	50	SP3	YES	APTM10DDAM19T3G	APTM10DSKM19T3G
		9	100	SP3	YES	APTM10DDAM09T3G	APTM10DSKM09T3G
500	MOS 7	100	24	SP3	YES	APTM50DDA10T3G	APTM50DSK10T3G
		65	37	SP3	YES	APTM50DDAM65T3G	APTM50DSKM65T3G
600	COOLMOS	45	38	SP1	YES	APTC60DDAM45T1G	APTC60DSKM45T1G
		70	29	SP1	YES	APTC60DDAM70T1G	APTC60DSKM70T1G
		70	29	SP3	YES	APTC60DDAM70T3G	APTC60DSKM70T3G
		35	54	SP3	YES	APTC60DDAM35T3G	APTC60DSKM35T3G
24	70	SP3	YES	APTC60DDAM24T3G	APTC60DSKM24T3G		
800	COOLMOS	290	11	SP3	YES	APTC80DDA29T3G	APTC80DSK29T3G
		150	21	SP3	YES	APTC80DDA15T3G	APTC80DSK15T3G
900	COOLMOS	120	23	SP1	YES	APTC90DDA12T1G	APTC90DSK12T1G
1000	MOS 7	350	17	SP3	YES	APTM100DDA35T3G	APTM100DSK35T3G
1200	MOS 7	570	13	SP3	YES	APTM120DDA57T3G	APTM120DSK57T3G

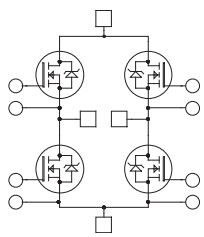
NEW!

NEW!

NEW!

MOSFET Power Modules

FULL BRIDGE



V _{DSS} (V)	MOSFET TYPE	R _{DS(ON)} (mΩ)	I _D (A) T _c =80°C	Package Style	NTC	Part Number	
100	FREDFET 5	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	
		140	18	SP3	YES	APTM50H14FT3G	
500	FREDFET 7	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	150	19	SP1	YES	APTM50H15UT1G	
	600	COOLMOS	70	29	SP1	YES	APTC60HM70T1G
			45	38	SP1	YES	APTC60HM45T1G
70			29	SP3	YES	APTC60HM70T3G	
35			54	SP3	YES	APTC60HM35T3G	
FREDFET 8		230	15	SP1	YES	APTM60H23UT1G	
800	COOLMOS	290	11	SP1	YES	APTC80H29T1G	
		150	21	SP1	YES	APTC80H15T1G	
		290	11	SP3	YES	APTC80H29T3G	
		150	21	SP3	YES	APTC80H15T3G	
900	COOLMOS	120	23	SP1	YES	APTC90H12T1G	
		60	44	SP3	YES	APTC90HM60T3G	
		450	14	SP3	YES	APTM100H45FT3G	
1000	FREDFET 7	350	17	SP4	YES	APTM100H35FTG	
		350	17	SP3	YES	APTM100H35FT3G	
		180	33	SP6	-	APTM100H18FG	
	FREDFET 8	800	8	SP1	YES	APTM100H80FT1G	
		460	14	SP3	YES	APTM100H46FT3G	
		400	16	SP3	YES	APTM100H40FT3G	
1200	FREDFET 7	570	13	SP4	YES	APTM120H57FTG	
		570	13	SP3	YES	APTM120H57FT3G	
		290	25	SP6	-	APTM120H29FG	
	FREDFET 8	1400	6	SP1	YES	APTM120H140FT1G	
		800	10	SP3	YES	APTM120H80FT3G	
		650	12	SP3	YES	APTM120H65FT3G	



SP1



SP3



NEW!

SP4



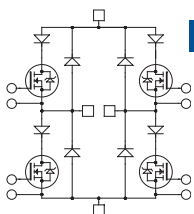
NEW!

SP6

NEW!

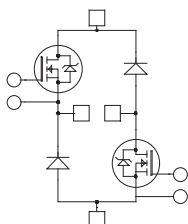
NEW!

FULL BRIDGE + SERIES AND PARALLEL DIODES



V _{DSS} (V)	MOSFET TYPE	R _{DS(ON)} (mΩ)	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

ASYMMETRICAL BRIDGE



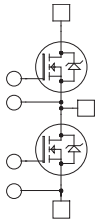
V _{DSS} (V)	MOSFET Type	R _{DS(ON)} (mΩ)	I _D (A) T _c =80°C	Package Style	NTC	Part Number
100	MOS5	9	100	SP3	YES	APTM10DHM09T3G
		9	100	SP4	YES	APTM10DHM09TG
		4.5	207	SP6	-	APTM10DHM05G
200	MOS 7	20	62	SP4	YES	APTM20DHM20TG
		16	74	SP4	YES	APTM20DHM16TG
		10	125	SP6	-	APTM20DHM10G
		8	147	SP6	-	APTM20DHM08G
		75	32	SP4	YES	APTM50DHM75TG
500	MOS 7	65	37	SP4	YES	APTM50DHM65TG
		38	64	SP6	-	APTM50DHM38G
		35	70	SP6	-	APTM50DHM35G
		MOS 8	65	72	SP3	-
600	COOLMOS	45	38	SP1	YES	APTC60DHM45T1G
		35	54	SP3	YES	APTC60DHM35T3G
		24	70	SP6	-	APTM50DHM24T3G

NEW!

NEW!

NEW!

PHASE LEG



V _{DSS} (V)	MOSFET TYPE	R _{DS(ON)} (mΩ)	I _D (A) T _c =80°C	Package Style	NTC	Part Number
100	FREDFET 5	4.5	207	SP4	YES	APTM10AM05FTG
		2.25	370	SP6	option	APTM10AM02FG
200	FREDFET 7	10	125	SP4	YES	APTM20AM10FTG
		8	147	SP4	YES	APTM20AM08FTG
		5	250	SP6	option	APTM20AM05FG
		4	300	SP6	option	APTM20AM04FG
500	FREDFET 7	38	64	SP4	YES	APTM50AM38FTG
		35	70	SP4	YES	APTM50AM35FTG
		19	125	SP6	option	APTM50AM19FG
	FREDFET 8	17	140	SP6	option	APTM50AM17FG
		150	19	SP1	YES	APTM50A15UT1G
		70	37	SP1	YES	APTM50AM70UT1G
600	COOLMOS	70	29	SP1	YES	APTC60AM70T1G
		45	38	SP1	YES	APTC60AM45T1G
		35	54	SP1	YES	APTC60AM35T1G
		24	70	SP1	YES	APTC60AM24T1G
	FREDFET 8	230	15	SP1	YES	APTM60A23UT1G
		110	30	SP1	YES	APTM60A11UT1G
800	COOLMOS	150	21	SP1	YES	APTC80A15T1G
900	COOLMOS	120	23	SP1	YES	APTC90A120T1G
		60	44	SP1	YES	APTC90AM60T1G
1000	FREDFET 7	180	33	SP4	YES	APTM100A18FTG
		90	59	SP6	option	APTM100AM90FG
	FREDFET 8	460	14	SP1	YES	APTM100A46FT1G
		400	16	SP1	YES	APTM100A40FT1G
1200	FREDFET 7	290	25	SP4	YES	APTM120A29FTG
		150	45	SP6	option	APTM120A15FG
	FREDFET 8	800	10	SP1	YES	APTM120A80FT1G
		650	12	SP1	YES	APTM120A65FT1G



SP4



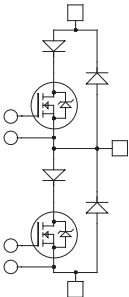
SP6

NEW!



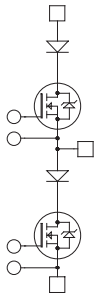
SP6-P

PHASE LEG + SERIES AND PARALLEL DIODES



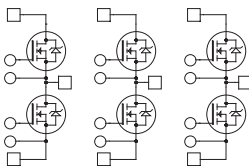
V _{DSS} (V)	MOSFET Type	R _{DS(ON)} (mΩ)	I _D (A) T _c =80°C	Package Style	NTC	Part Number
200	MOS 7	10	125	SP4	YES	APTM20AM10STG
		6	225	SP6	-	APTM20AM06SG
500	MOS 7	38	64	SP4	YES	APTM50AM38STG
		24	110	SP6	-	APTM50AM24SG
1000	MOS 7	230	26	SP4	YES	APTM100A23STG
		130	49	SP6	-	APTM100A13SG
1200	MOS 7	200	37	SP6	-	APTM120A20SG

PHASE LEG + SERIES DIODES



V _{DSS} (V)	MOSFET Type	R _{DS(ON)} (mΩ)	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

TRIPLE PHASE LEG



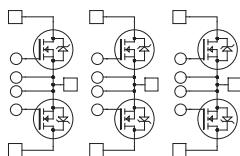
V _{DSS} (V)	MOSFET Type	R _{DS(ON)} (mΩ)	I _D (A) T _c =80°C	Package Style	NTC	Part Number
75	MOSFET	4.2	90	SP6-P	option	APTM08TAM04PG
100	FREDFET 5	19	50	SP6-P	option	APTM10TAM19FPG
		9	100	SP6-P	option	APTM10TAM09FPG
200	FREDFET 7	16	74	SP6-P	option	APTM20TAM16FPG
500	FREDFET 7	65	37	SP6-P	option	APTM50TAM65FPG
600	COOLMOS	35	54	SP6-P	option	APTC60TAM35PG
		24	70	SP6-P	YES	APTC60TDUM24TPG
800	COOLMOS	150	21	SP6-P	option	APTC80TA15PG
900	COOLMOS	60	44	SP6-P	YES	APTC90TDUM60TPG
1000	FREDFET 7	350	17	SP6-P	option	APTM100TA35FPG
1200	FREDFET 7	570	13	SP6-P	option	APTM120TA57FPG

NEW!

NEW!

MOSFET Power Modules

TRIPLE DUAL COMMON SOURCE



V _{DSS} (V)	MOSFET Type	R _{DS(ON)} (mΩ)	I _D (A) T _C =80° C	Package	NTC	Part Number
75	MOSFET	4.2	90	SP6-P	option	APTM08TDUM04PG
100	MOS 5	19	50	SP6-P	option	APTM10TDUM19PG
		9	100	SP6-P	option	APTM10TDUM09PG
200	MOS 7	16	74	SP6-P	option	APTM20TDUM16PG
500	MOS 7	65	37	SP6-P	option	APTM50TDUM65PG
600	COOLMOS	35	54	SP6-P	option	APTC60TDUM35PG
		24	70	SP6-P	YES	APTC60TDUM24TPG
800	COOLMOS	150	21	SP6-P	option	APTC80TDU15PG
900	COOLMOS	60	44	SP6-P	YES	APTC90TAM60TPG
1000	MOS 7	350	17	SP6-P	option	APTM120TDU35PG
1200	MOS 7	570	13	SP6-P	option	APTM120TDU57PG



SP4

NEW!

NEW!

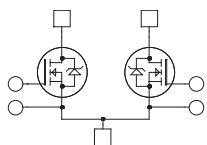


SP6



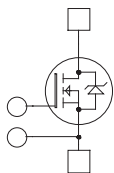
SP6-P

DUAL COMMON SOURCE



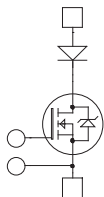
V _{DSS} (V)	MOSFET Type	R _{DS(ON)} (mΩ)	I _D (A) T _C =80° C	Package	NTC	Part Number
100	MOS 5	4.5	207	SP4	YES	APTM10DUM05TG
		2.25	370	SP6	-	APTM10DUM02G
200	MOS 7	10	125	SP4	YES	APTM20DUM10TG
		8	147	SP4	YES	APTM20DUM08TG
		5	250	SP6	-	APTM20DUM05G
		4	300	SP6	-	APTM20DUM04G
500	MOS 7	38	64	SP4	YES	APTM50DUM38TG
		35	70	SP4	YES	APTM50DUM35TG
		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

SINGLE SWITCH



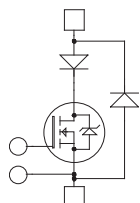
V _{DSS} (V)	MOSFET Type	R _{DS(ON)} (mΩ)	I _D (A) T _C =80° C	Package	NTC	Part Number
100	FREDFET 5	2.25	430	SP6	option	APTM10UM02FAG
		1.50	640	SP6	option	APTM10UM01FAG
200	FREDFET 7	3	434	SP6	option	APTM20UM03FAG
500	FREDFET 7	9	371	SP6	option	APTM50UM09FAG
1000	FREDFET 7	60	97	SP6	option	APTM100UM60FAG
		45	160	SP6	option	APTM100UM45FAG
1200	FREDFET 7	95	77	SP6	option	APTM120UM95FAG
		70	126	SP6	option	APTM120UM70FAG

SINGLE SWITCH + SERIES DIODE



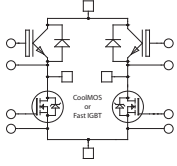
V _{DSS} (V)	MOSFET Type	R _{DS(ON)} (mΩ)	I _D (A) T _C =80° C	Package	NTC	Part Number
1000	MOS 7	65	110	SP6	-	APTM100UM65DAG
		45	160	SP6	-	APTM100UM45DAG
1200	MOS 7	100	86	SP6	-	APTM120U10DAG
		70	126	SP6	-	APTM120UM70DAG

SINGLE SWITCH + SERIES AND PARALLEL DIODES



V _{DSS} (V)	MOSFET Type	R _{DS(ON)} (mΩ)	I _D (A) T _C =80° C	Package	NTC	Part Number
200	MOS 7	4	310	SP6	-	APTM20UM04SAG
500	MOS 7	13	250	SP6	-	APTM50UM13SAG
1000	MOS 7	65	100	SP6	-	APTM100UM65SAG
1200	MOS 7	100	86	SP6	-	APTM120U10SAG

FULL BRIDGE



V _{CES} (V)	Technology	I _c (A) T _c =80° C	V _{CE(on)} (V) at rated I _c	Package	NTC	Part Number
600	DC/AC Inverter (NPT/Trench IGBT)	30	2.1/1.5	SP3	YES	APTVG30H60T3G
		50	2.1/1.5	SP3	YES	APTVG50H60T3G
		75	2.1/1.5	SP3	YES	APTVG75H60T3G
		100	2.1/1.5	SP3	YES	APTVG100H60T3G
1200	DC/AC Inverter (CoolMOS/Trench IGBT)	50	83mR/1.5	SP1	YES	APTCV40H60CT1G
		50	45mR/1.5	SP3	YES	APTCV50H60T3G
		50	45mR/1.5	SP3	YES	APTCV50H60T3G
1200	DC/AC Inverter (NPT/Trench IGBT)	15	3.2/1.7	SP3	YES	APTVG15H120T3G
		25	3.2/1.7	SP3	YES	APTVG25H120T3G
		50	3.2/1.7	SP3	YES	APTVG50H120T3G



SP1

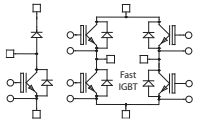


SP3



SP4

BOOST CHOPPER + FULL BRIDGE



V _{CES} (V)	Technology	I _c (A) T _c =80° C	V _{CE(on)} (V) at rated I _c	Package	NTC	Part Number
600	DC/AC Inverter (NPT/Trench IGBT)	50	2.1/1.5	SP4	-	APTVG50H60BG
		100	2.1/1.5	SP6-P	YES	APTVG100H60BTPG
1200	DC/AC Inverter (NPT/Trench IGBT)	25	3.2/1.7	SP4	-	APTVG25H120BG
		50	3.2/1.7	SP6-P	YES	APTVG50H120BTPG



SP6

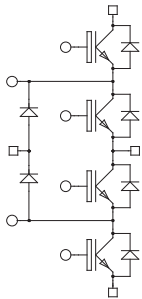
NEW!



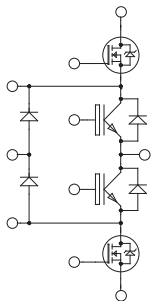
SP6-P

NEW!

THREE LEVEL INVERTER



V _{CES} (V)	Technology	I _c (A) T _c =80° C	V _{CE(on)} (V) at rated I _c	Package	NTC	Part Number
600	TRENCH	20	1.5	SP3	YES	APVTG20TL60T3G
		20	1.5	SP1	-	APVTG20TL601G
		30	1.5	SP3	YES	APVTG30TL60T3G
		30	1.5	SP1	-	APVTG30TL601G
		50	1.5	SP3	YES	APVTG50TL60T3G
		50	1.5	SP1	-	APVTG50TL601G
		75	1.5	SP3	YES	APVTG75TL60T3G
		100	1.5	SP3	YES	APVTG100TL60T3G
		150	1.5	SP6	-	APVTG150TL60G
		200	1.5	SP6	-	APVTG200TL60G
		300	1.5	SP6	-	APVTG300TL60G
		30	2.1	SP3	YES	APVTF30TL60T3G
		30	2.1	SP1	-	APVTF30TL601G
1200	TRENCH 4	50	2.1	SP3	YES	APVTF50TL60T3G
		60	1.85	SP3	YES	APVTF60TL120T3G



V _{CES} (V)	Technology	R _{DS(ON)} COOLMOS (mΩ)	V _{CE(on)} IGBT (V) / I _c (A)	Package	NTC	Part Number
600	Mix Coolmos/Trench IGBT	45	1.5/75	SP3	YES	APTCV60TLM45T3G
		70	1.5/50	SP3	YES	APTCV60TLM70T3G
		99	1.5/30	SP3	YES	APTCV60TLM99T3G
		99	1.5/30	SP1	-	APTCV60TLM991G
900	Mix Coolmos/Trench IGBT	120	1.85/50	SP3	YES	APTCV90TLM12T3G

Power Modules with SiC Schottky Diodes

Silicon Carbide (SiC) Schottky Diodes offers superior dynamic and thermal performance over conventional Silicon power diodes. The main advantages of the SiC Schottky Diodes are:

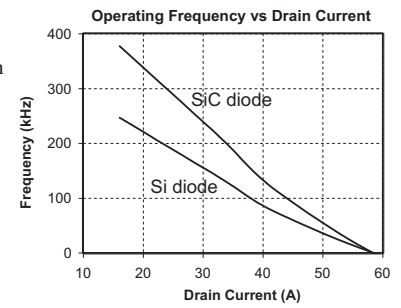
- Essentially zero forward and reverse recovery = reduced switch and diode switching losses
- Temperature independent switching behavior = stable high temperature performance
- Positive temperature coefficient of VF = ease of parallel operation
- Usable 175°C Junction Temperature = safely operate at higher temperatures

Extremely fast switching of SiC Schottky diode enables designs with:

- Improved System Efficiency
- Higher Reliability
- Lower System Switching Losses
- Lower System Cost
 - Smaller EMI Filter
 - Smaller Magnetic Components
 - Smaller Heat-Sink
 - Smaller Switches, Eliminate Snubbers
- Reduced System Size
 - Fewer / Smaller Components

Applications:

- PFC
- Output Rectification
- Solar Inverter
- Motor Control
- Snubber Diode



Dual Power Modules with SiC Diodes

DUAL DIODE

V_{RRM} (V)	DIODE type	I_F (A) $T_c=100^\circ\text{C}$	I_D (A) $T_j=25^\circ\text{C}$	Package	Anti-Parallel	Parallel
600	SiC	20	1.6	SOT227	APT2X20DC60J	APT2X21DC60J
		30	1.6	SOT227	APT2X30DC60J	APT2X31DC60J
		40	1.6	SOT227	APT2X40DC60J	APT2X41DC60J
		50	1.6	SOT227	APT2X50DC60J	APT2X51DC60J
		60	1.6	SOT227	APT2X60DC60J	APT2X61DC60J
		90	1.6	SP1	APTDC902U601G	
1200	SiC	20	1.6	SOT227	APT2X20DC120J	APT2X21DC120J
		30	1.6	SOT227	APT2X30DC120J	APT2X31DC120J
		40	1.6	SOT227	APT2X40DC120J	APT2X41DC120J
		50	1.6	SOT227	APT2X50DC120J	APT2X51DC120J
		60	1.6	SOT227	APT2X60DC120J	APT2X61DC120J
		90	1.6	SP1	APTDC902U1201G	



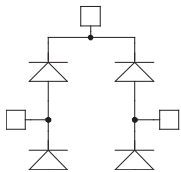
SOT-227



SP1

NEW!

FULL BRIDGE

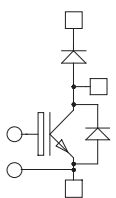


V_{RRM} (V)	DIODE Type	I_F (A) $T_c=100^\circ\text{C}$	I_D (A) $T_j=25^\circ\text{C}$	Package	Part Number
600	SiC	10	1.6	SP1	APTDC10H601G
		20	1.6	SP1	APTDC20H601G
		30	1.6	SP1	APTDC30H601G
		40	1.6	SP1	APTDC40H601G
1200	SiC	10	1.6	SP1	APTDC10H1201G
		20	1.6	SP1	APTDC20H1201G
		30	1.6	SP1	APTDC30H1201G
		40	1.6	SP1	APTDC40H1201G

NEW!

IGBT Power Modules with SiC Diodes

BOOST CHOPPER



V_{CES} (V)	IGBT	I_C (A) $T_c=80^\circ\text{C}$	$V_{CE(on)}$ (V) at rated I_C	Package	NTC	Part Number
600	NPT	30	2.1	SOT227	-	APT30GF60JCU2
		50	2.1	SOT227	-	APT50GF60JCU2
		90	2.1	SP1	YES	APTGF90DA60CT1G
1200	NPT	15	3.2	SOT227	-	APT15GF120JCU2
		25	3.2	SOT227	-	APT25GF120JCU2
		50	3.2	SP1	YES	APTGF50DA120CT1G

SOT-227

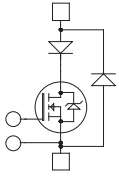


SP1

NEW!

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

MOSFETs & COOLMOS™ Power Modules with SiC Diodes



SINGLE SWITCH + SERIES FRED AND SIC PARALLEL DIODES

V _{DSS} (V)	MOSFET Type	R _{DS(ON)} (mΩ)	I _D (A) T _c =80° C	Package	NTC	Part Number
1000	MOS 7	165	110	SP6	option	APTM100U65SCVAG
1200	MOS 7	100	86	SP6	option	APTM120U10SCVAG

NEW!



SOT-227

CHOPPER

V _{DSS} (V)	MOSFET Type	R _{DS(ON)} (mΩ)	I _D (A) T _c =80° C	Package	NTC	...DA...or...U2	...SK...or...U3
500	MOS 7	38	67	SP4	YES	APTM50DAM38CTG	N/A
	MOS 8	65	43	SOT227	-	APT58M50JCU2	APT58M50JCU3
600	COOLMOS	45	38	SOT227	-	APT50N60JCCU2	N/A
		24	70	SP1	YES	APTC60DAM24CT1G	APTC60DSKM24CT1G
900	COOLMOS	18	107	SP4	YES	APTC60DAM18CTG	N/A
		120	25	SOT227	-	APT33N90JCCU2	APT33N90JCCU3
1000	MOS 8	60	44	SP1	YES	APTC90DAM60CT1G	APTC90DSKM60CT1G
		330	20	SOT227	-	APT26M100JCU2	APT26M100JCU3
		400	17	SOT227	-	APT22M100JCU2	APT22M100JCU3
1200	MOS 8	180	30	SP1	YES	APTM100DA18CT1G	N/A
		560	15	SOT227	-	APT20M120JCU2	APT20M120JCU3
		680	13	SOT227	-	APT17M120JCU2	APT17M120JCU3
		300	23	SP1	YES	APTM120DA30CT1G	N/A

NEW!



SP1

NEW!

DUAL CHOPPER

V _{DSS} (V)	MOSFET Type	R _{DS(ON)} (mΩ)	I _D (A) T _c =80° C	Package	NTC	...DDA...	...DSK...
600	COOLMOS	45	38	SP1	YES	APTC60DDAM45CT1G	APTC60DSKM45CT1G
		70	29	SP1	YES	APTC60DDAM70CT1G	APTC60DSKM70CT1G
900	COOLMOS	120	23	SP1	YES	APTC90DDA12CT1G	APTC90DSK12CT1G

NEW!



SP4

PHASE LEG + SERIES FRED AND SIC PARALLEL DIODES

V _{DSS} (V)	MOSFET Type	R _{DS(ON)} (mΩ)	I _D (A) T _c =80° C	Package	NTC	Part Number
500	MOS 7	38	67	SP4	YES	APTM50AM38SCTG
		24	110	SP6	-	APTM50AM24SCG
600	COOLMOS	35	54	SP4	YES	APTC60AM35SCTG
		24	70	SP4	YES	APTC60AM24SCTG
800	COOLMOS	18	107	SP6	-	APTC60AM18SCG
		150	21	SP4	YES	APTC80A15SCTG
		100	32	SP4	YES	APTC80A10SCTG
900	COOLMOS	75	43	SP6	-	APTC80AM75SCG
		60	44	SP4	YES	APTC90AM60SCTG
1000	MOS 7	230	27	SP4	YES	APTM100A23SCTG
		130	49	SP6	-	APTM100A13SCG

NEW!

NEW!



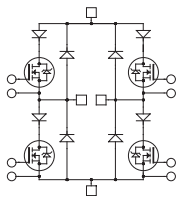
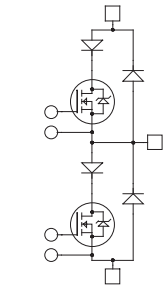
SP6

FULL BRIDGE + SERIES FRED AND SIC PARALLEL DIODES

V _{DSS} (V)	MOSFET Type	R _{DS(ON)} (mΩ)	I _D (A) T _c =80° C	Package	NTC	Part Number
500	MOS 7	75	34	SP4	YES	APTM50HM75SCTG
600	COOLMOS	70	29	SP4	YES	APTC60HM70SCTG
		45	38	SP4	YES	APTC60HM45SCTG
800	COOLMOS	290	11	SP4	YES	APTC80H29SCTG
900	COOLMOS	120	23	SP4	YES	APTC90H12SCTG
1000	MOS 7	450	14	SP4	YES	APTM100H45SCTG

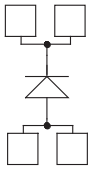
NEW!

NEW!



DIODE Power Modules

SINGLE DIODE

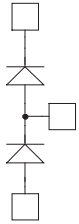


V_{RRM} (V)	FRED Type	IF(A) $T_c=80^\circ\text{C}$	VF(V) $T_j=25^\circ\text{C}$	Package Style	Part Number
200	FRED	500	1.1	LP4	APTDF500U20G
400	FRED	500	1.5	LP4	APTDF500U40G
600	FRED	450	1.8	LP4	APTDF450U60G
1000	FRED	430	2.3	LP4	APTDF430U100G
1200	FRED	400	2.5	LP4	APTDF400U120G



LP4

PHASE LEG



V_{RRM} (V)	FRED Type	IF(A) $T_c=80^\circ\text{C}$	VF(V) $T_j=25^\circ\text{C}$	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
1600	Rectifier	36	1.15	SD1	MSCD36-16
		60	1.15	SD1	MSCD60-16
		70	1.15	SD1	MSCD70-16
		100	1.15	SD1	MSCD100-16
		120	1.15	SD1	MSCD120-16
		165	1.15	SD2	MSCD165-16
200	1.15	SD2	MSCD200-16		
1700	FRED	400	2.2	SP6	APTDF400AK170G



SP6



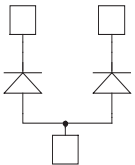
SP4

NEW!



SP6

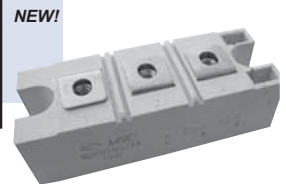
DUAL COMMON ANODE



V_{RRM} (V)	FRED Type	IF(A) $T_c=80^\circ\text{C}$	VF(V) $T_j=25^\circ\text{C}$	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
1600	Rectifier	36	1.15	SD1	MSAD36-16
		60	1.15	SD1	MSAD60-16
		70	1.15	SD1	MSAD70-16
		100	1.15	SD1	MSAD100-16
		120	1.15	SD1	MSAD120-16
		165	1.15	SD2	MSAD165-16
200	1.15	SD2	MSAD200-16		
1700	FRED	400	2.2	SP6	APTDF400AA170G



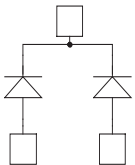
SD1



SD2

NEW!

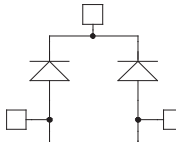
DUAL COMMON CATHODE



V_{RRM} (V)	FRED Type	IF(A) $T_c=80^\circ\text{C}$	VF(V) $T_j=25^\circ\text{C}$	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
1600	Rectifier	36	1.15	SD1	MSKD36-16
		60	1.15	SD1	MSKD60-16
		70	1.15	SD1	MSKD70-16
		100	1.15	SD1	MSKD100-16
		120	1.15	SD1	MSKD120-16
		165	1.15	SD2	MSKD165-16
200	1.15	SD2	MSKD200-16		
1700	FRED	400	2.2	SP6	APTDF400KK170G

NEW!

FULL BRIDGE



V_{RRM} (V)	FRED Type	I_F (A) $T_c=80^\circ\text{C}$	V_F (V) $T_j=25^\circ\text{C}$	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
		200	1.6	SP6	APTDF200H60G
		100	2.1	SP4	APTDF100H100G
1000	FRED	200	2.1	SP6	APTDF200H100G
		30	2.6	SP1	APTDF30H1201G
1200	FRED	60	2.5	SP1	APTDF60H1201G
		100	2.5	SP1	APTDF100H1201G
		200	2.4	SP6	APTDF200H120G
1700	FRED	100	2.2	SP4	APTDF100H170G
		200	2.2	SP6	APTDF200H170G



SP1

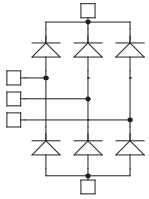


SP4



SP6

3-PHASE BRIDGE - RECTIFIER DIODE



V_{RRM} (V)	FRED Type	I_F (A) $T_c=80^\circ\text{C}$	V_F (V) $T_j=25^\circ\text{C}$	Package Style	Part Number
1600	Rectifier	40	1.3	SP1	APTDR40X1601G
		90	1.3	SP1	APTDR90X1601G
		40	1.3	SP1	APTDR40X1601G
		52	1.15	SM2	MSD52-16
		75	1.15	SM2	MSD75-16
		90	1.3	SP1	APTDR90X1601G
		100	1.15	SM3	MSD100-16
		130	1.15	SM3	MSD130-16
		160	1.15	SM3	MSD160-16
		200	1.2	SM3	MSD200-16

NEW!

NEW!



SM2

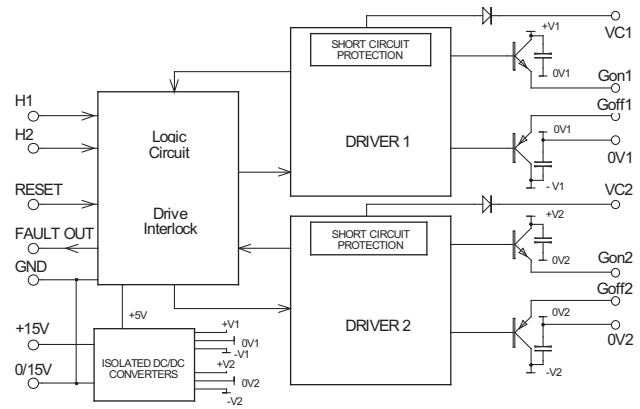


SM3

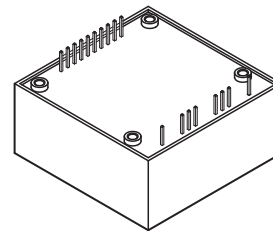
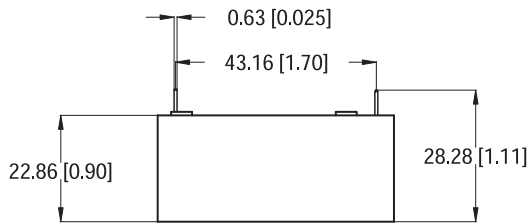
Dual IGBT Isolated Driver

V _{cc} 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

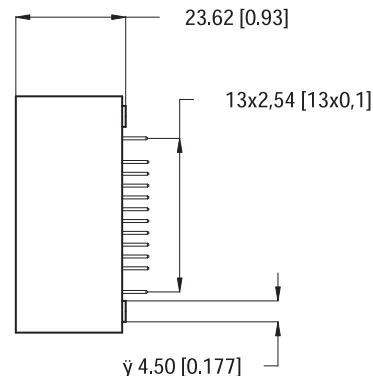
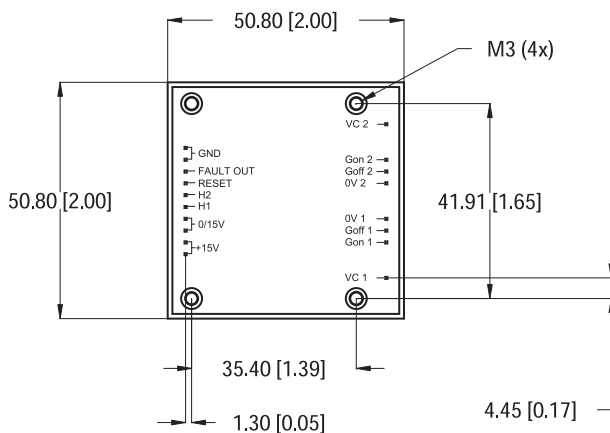
- Driver For Phase Leg IGBT up to 300A/1200V or 600A/600V
- Short Circuit Protection
- Under Voltage Lockout
- Integrated Auxillary Power Supplies
- TTL Compatible Inputs
- Very High EMI Immunity
- Fault and Reset Signals
- RGon and RGoFF Externally Selectable
- Dimensions: 50.8mm(H) X 50.8mm(W) X 23.6mm(D)



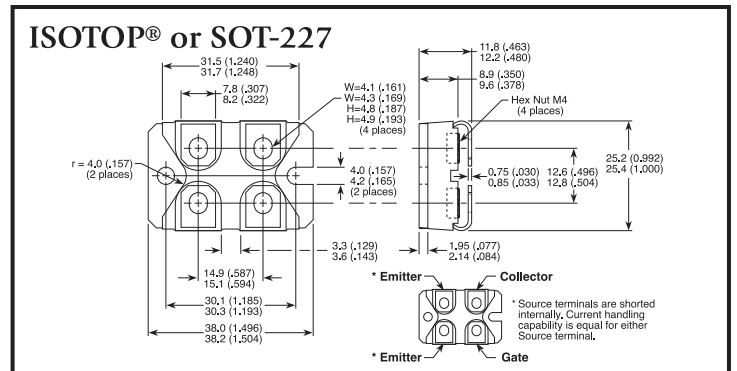
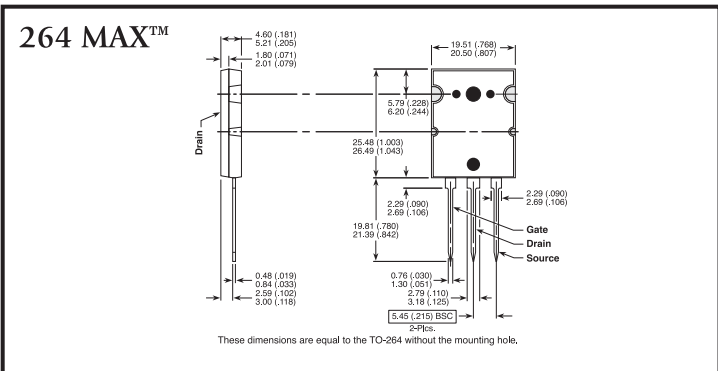
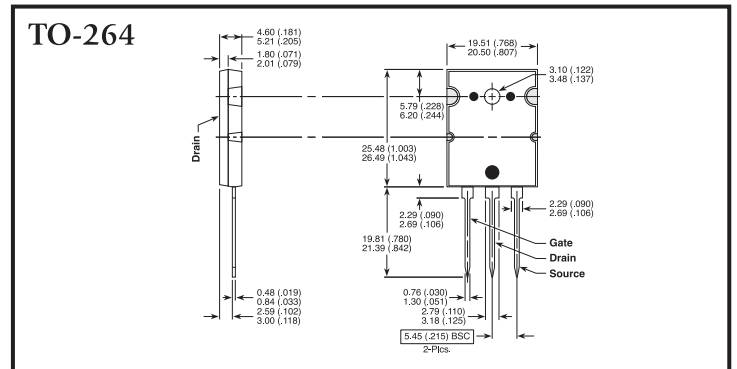
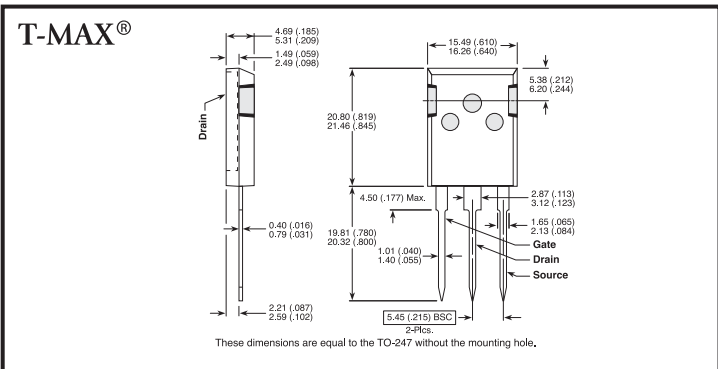
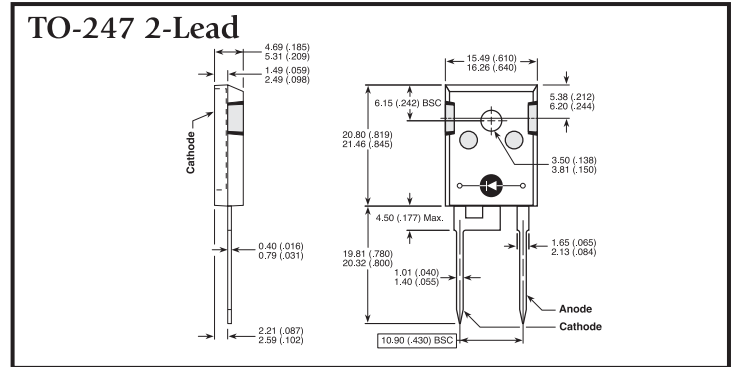
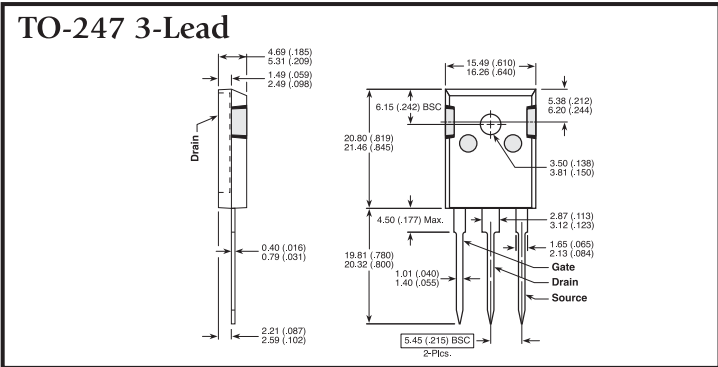
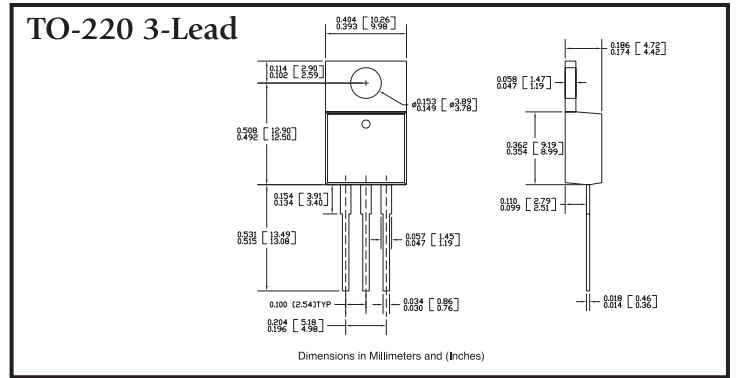
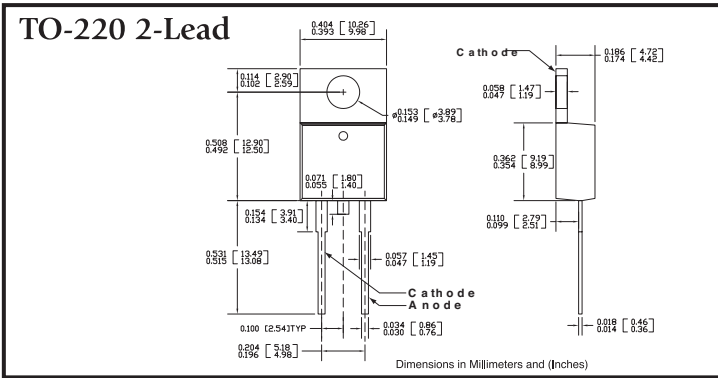
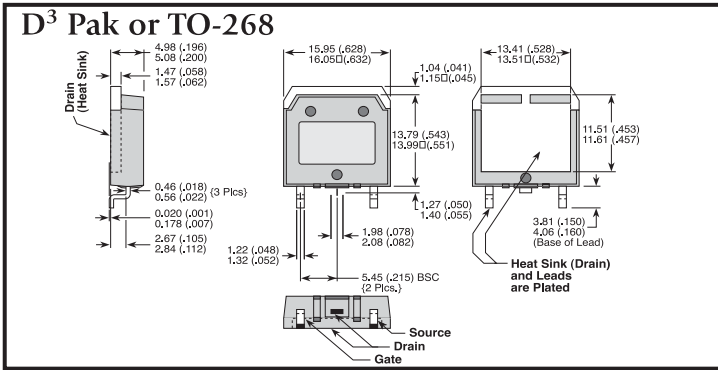
DIMENSIONS



UNITS : mm [inch]
GENERAL TOLERANCES :
+/- 0.25mm (+/-0.01")



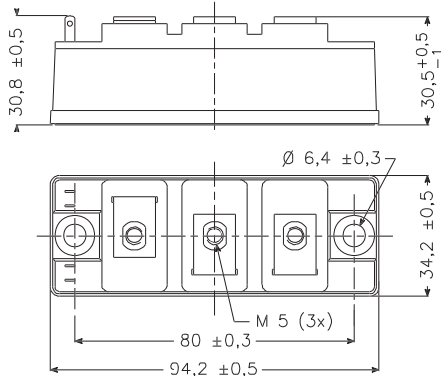
Refer to web page for additional package outline drawings



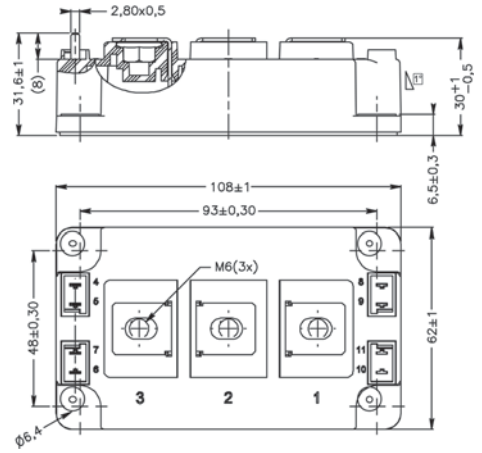
Power Module Outlines

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

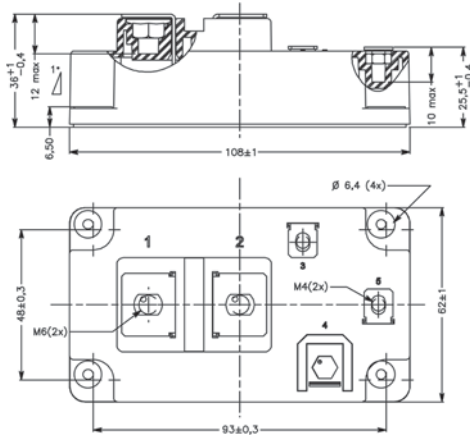
D1



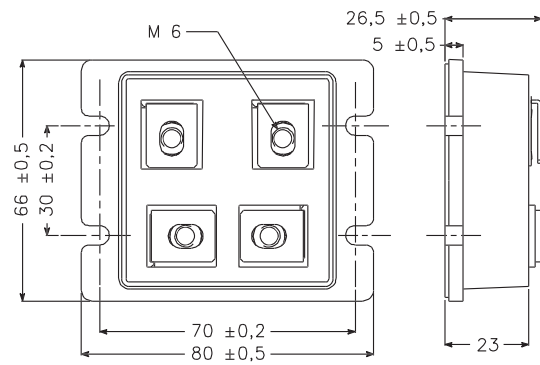
D3



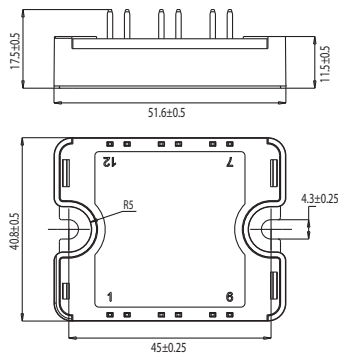
D4



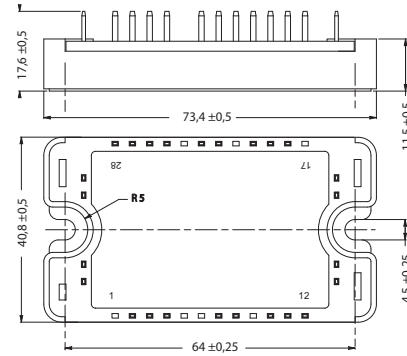
LP4



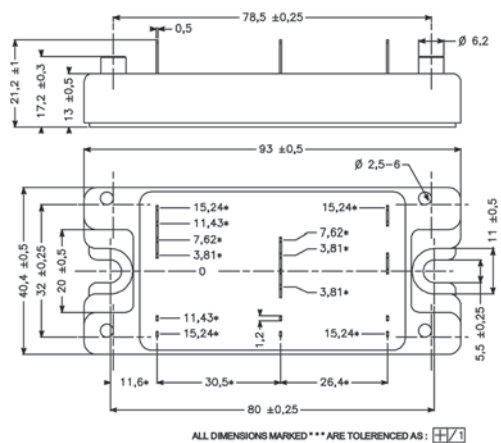
SP1



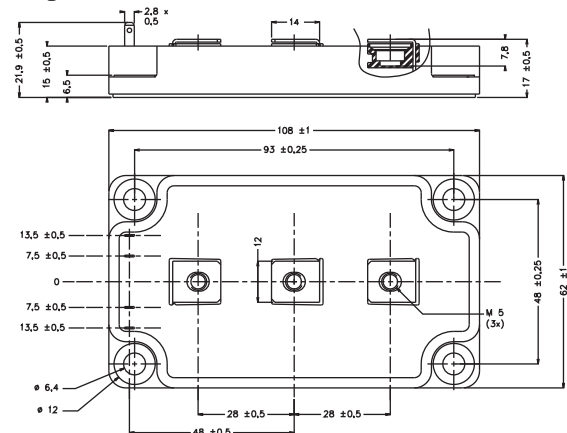
SP3



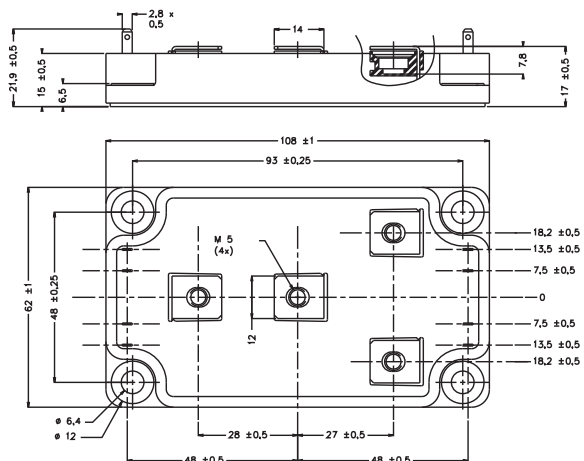
SP4



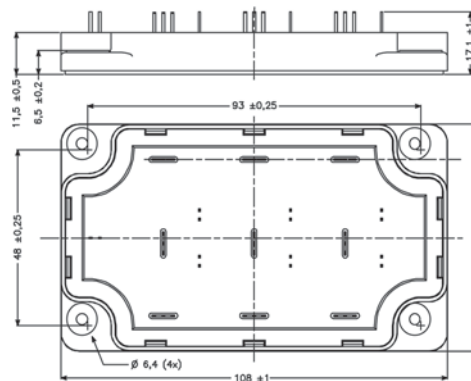
SP6 - 3 outputs



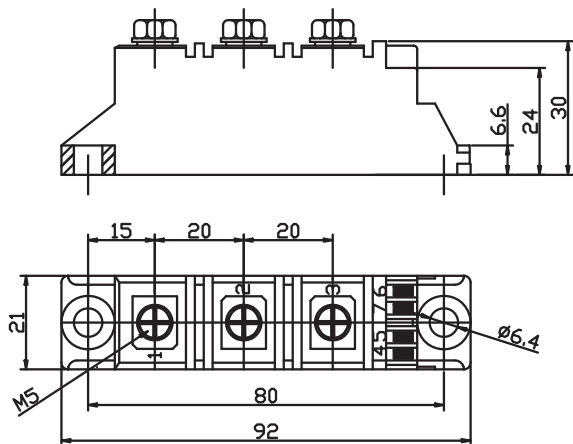
SP6 - 4 outputs



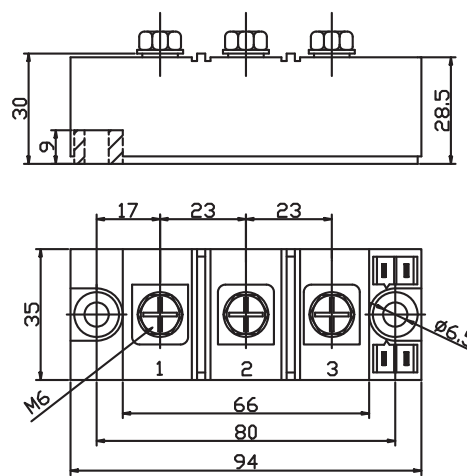
SP6 -P



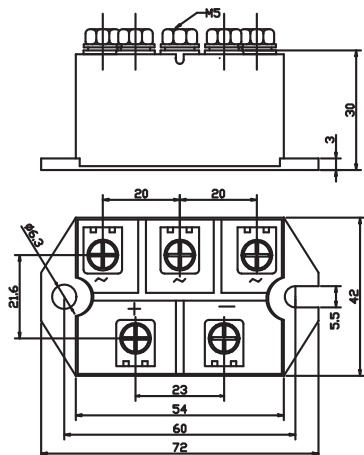
SD1



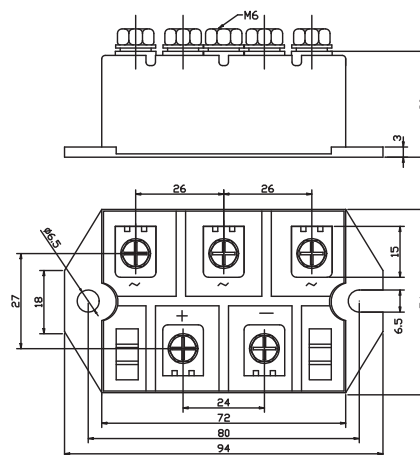
SD2



SM2



SM3





Power Semiconductor Products

405 SW Columbia Street
Bend, Oregon 97702
Phone: 541-382-8028
Toll Free USA: 800-522-0809
Fax: 541-388-0364

Power Modules

Chemin de Magret
33700 Merignac - France
Phone: 33-557 92 15 15
Fax: 33-556 47 97 61

Microsemi Corporate Office

2381 Morse Avenue
Irvine, CA 92614
Phone: 949-221-7100
Toll Free USA: 800-713-4113

Sales Offices

China

Room B, 27/F, Noble Center
No. 1006, 3rd Fuzhong Road, Futian District,
Shenzhen 518026, China
Email: china@microsemi.com
Phone: +86-755-83021311
Fax: +86-755-83021315

Hong Kong

7/F., Meeco Industrial Bldg
53-55 Au Pui Wan St.
Fotan, Shatin, NT., Kong Kong
Phone: +852-2692 1202
Fax: +852-2691 0544

Korea

30/F, ASEM Tower 159-1 Samsung dong
Kangnam-ku, Seoul 135-798 Korea
Phone: +82-2-6001 3155
Fax: +82-2-6001 3003

Taiwan

10F-A, No. 105, Sec 2, Dun Hua S. Rd.
Taipei 106, Taiwan, R.O.C
Phone: +886-2-6636 6588
Fax: +886-2-2701 9051

Asia-Pacific Rim

Tel: +886-2-6636-6588
E-Mail: rsmasia@microsemi.com

Eastern North America

Tel: (716) 699-5626
E-Mail: rsmeast@microsemi.com

Central North America

Tel: (303) 805-1674
E-Mail: rsmcen@microsemi.com

Western North America

Tel: (408) 307-9373
E-Mail: rsmwest@microsemi.com

Europe, Middle East, Africa

Tel: +32-12-453 465
E-Mail: rsmeurope@microsemi.com