

阅读申明

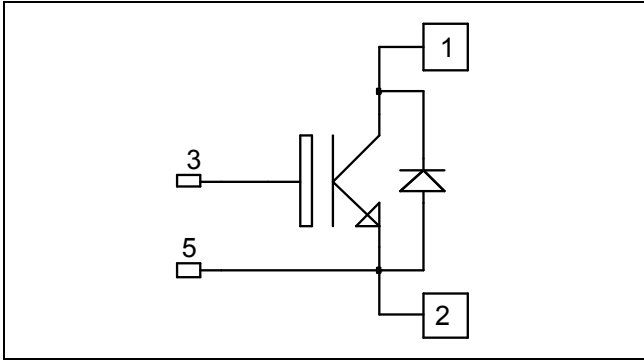
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Single switch NPT IGBT Power Module

$V_{CES} = 1200V$
 $I_C = 400A @ T_c = 80^\circ C$



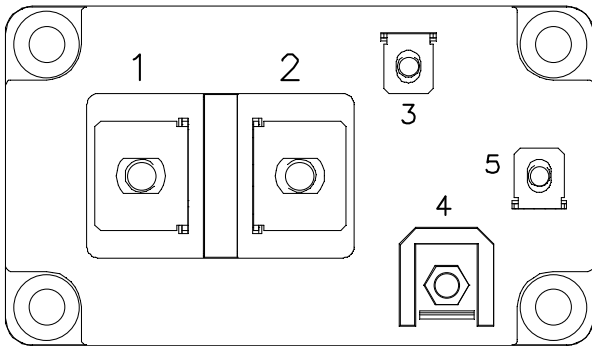
Application

- Welding converters
- Switched Mode Power Supplies
- Uninterruptible Power Supplies
- Motor control

Features

- Non Punch Through (NPT) FAST IGBT
 - Low voltage drop
 - Low tail current
 - Switching frequency up to 50 kHz
 - Soft recovery parallel diodes
 - Low diode VF
 - Low leakage current
 - RBSOA and SCSOA rated

- Kelvin emitter for easy drive
- M6 connectors for power
- M4 connectors for signal
- High level of integration



Benefits

- Outstanding performance at high frequency operation
- Stable temperature behavior
- Very rugged
- Direct mounting to heatsink (isolated package)
- Low junction to case thermal resistance
- Easy paralleling due to positive T_c of V_{CESat}
- RoHS Compliant

Absolute maximum ratings

Symbol	Parameter	Max ratings	Unit
V_{CES}	Collector - Emitter Breakdown Voltage	1200	V
I_C	Continuous Collector Current	$T_c = 25^\circ C$	510
		$T_c = 80^\circ C$	400
I_{CM}	Pulsed Collector Current	$T_c = 25^\circ C$	800
V_{GE}	Gate - Emitter Voltage	± 20	V
P_D	Maximum Power Dissipation	$T_c = 25^\circ C$	2500
RBSOA	Reverse Bias Safe Operating Area	$T_j = 150^\circ C$	800A @ 1100V

CAUTION: These Devices are sensitive to Electrostatic Discharge. Proper Handling Procedures Should Be Followed. See application note APT0502 on www.microsemi.com

All ratings @ $T_j = 25^\circ\text{C}$ unless otherwise specified

Electrical Characteristics

Symbol	Characteristic	Test Conditions	Min	Typ	Max	Unit
I_{CES}	Zero Gate Voltage Collector Current	$V_{GE} = 0\text{V}$; $V_{CE} = 1200\text{V}$			5	mA
$V_{CE(sat)}$	Collector Emitter saturation Voltage	$V_{GE} = 15\text{V}$ $I_C = 400\text{A}$	$T_j = 25^\circ\text{C}$	3.2	3.7	V
			$T_j = 125^\circ\text{C}$	3.9		
$V_{GE(th)}$	Gate Threshold Voltage	$V_{GE} = V_{CE}$, $I_C = 16\text{mA}$	4.5	5.5	6.5	V
I_{GES}	Gate – Emitter Leakage Current	$V_{GE} = 20\text{V}$, $V_{CE} = 0\text{V}$			400	nA

Dynamic Characteristics

Symbol	Characteristic	Test Conditions	Min	Typ	Max	Unit
C_{ies}	Input Capacitance	$V_{GE} = 0\text{V}$		26		nF
C_{oes}	Output Capacitance	$V_{CE} = 25\text{V}$		4		
C_{res}	Reverse Transfer Capacitance	$f = 1\text{MHz}$		2		
Q_G	Gate charge	$V_{GE} = \pm 15\text{V}$, $I_C = 400\text{A}$ $V_{CE} = 600\text{V}$		4.2		μC
$T_{d(on)}$	Turn-on Delay Time	Inductive Switching (25°C)		100		ns
T_r	Rise Time	$V_{GE} = 15\text{V}$ $V_{Bus} = 600\text{V}$		60		
$T_{d(off)}$	Turn-off Delay Time	$I_C = 400\text{A}$		530		
T_f	Fall Time	$R_G = 2.2\Omega$		40		
$T_{d(on)}$	Turn-on Delay Time	Inductive Switching (125°C)		110		ns
T_r	Rise Time	$V_{GE} = 15\text{V}$ $V_{Bus} = 600\text{V}$		70		
$T_{d(off)}$	Turn-off Delay Time	$I_C = 400\text{A}$		550		
T_f	Fall Time	$R_G = 2.2\Omega$		50		
E_{on}	Turn-on Switching Energy	$V_{GE} = 15\text{V}$ $V_{Bus} = 600\text{V}$	$T_j = 125^\circ\text{C}$	22		mJ
E_{off}	Turn-off Switching Energy	$I_C = 400\text{A}$ $R_G = 2.2\Omega$	$T_j = 125^\circ\text{C}$	29		
I_{sc}	Short Circuit data	$V_{GE} \leq 15\text{V}$; $V_{Bus} = 900\text{V}$ $t_p \leq 10\mu\text{s}$; $T_j = 125^\circ\text{C}$		2600		A

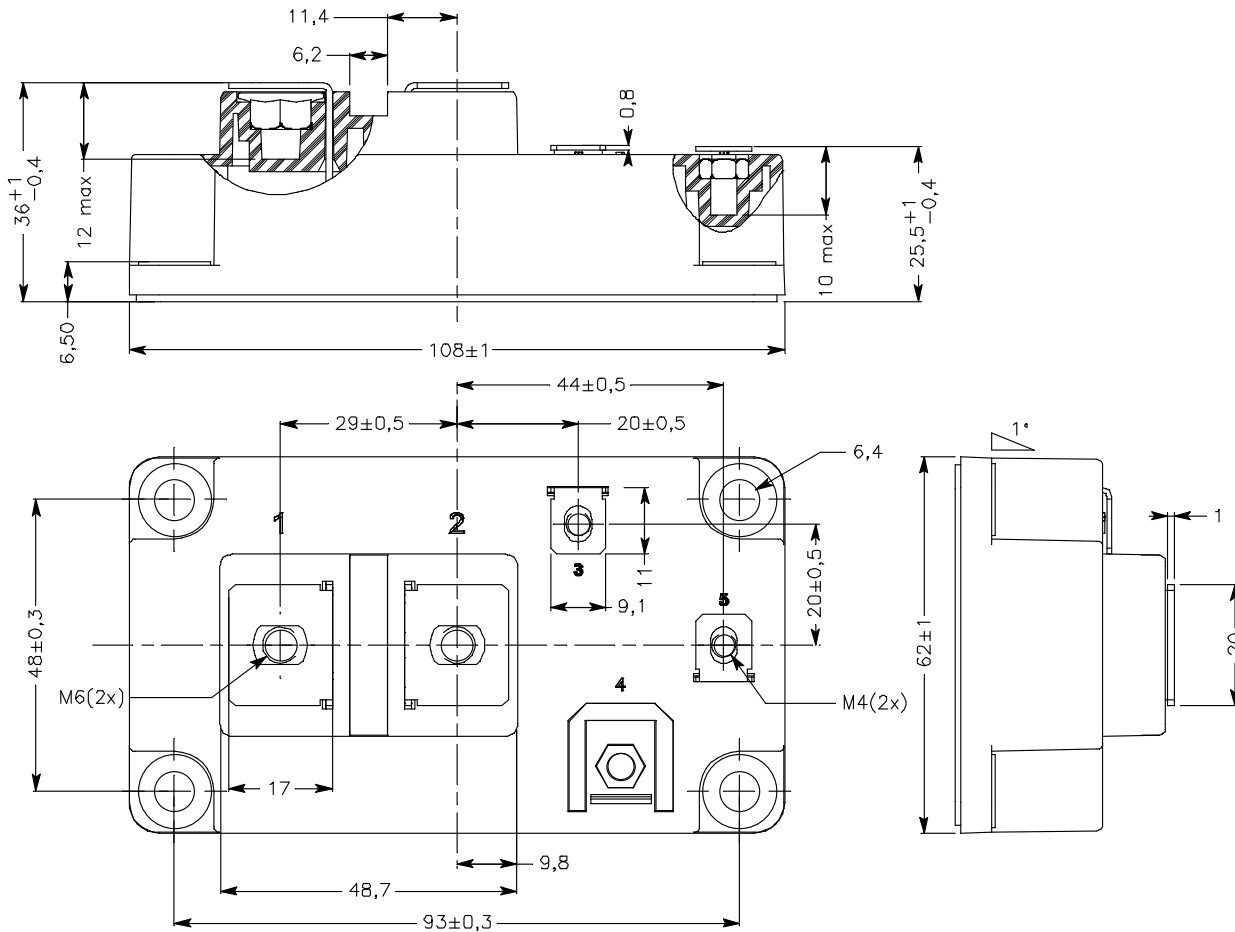
Reverse diode ratings and characteristics

Symbol	Characteristic	Test Conditions	Min	Typ	Max	Unit
V_{RRM}	Maximum Peak Repetitive Reverse Voltage		1200			V
I_{RRM}	Maximum Reverse Leakage Current	$V_R = 1200\text{V}$	$T_j = 25^\circ\text{C}$		750	μA
			$T_j = 125^\circ\text{C}$		1000	
I_F	DC Forward Current		$T_c = 80^\circ\text{C}$	400		A
V_F	Diode Forward Voltage	$I_F = 400\text{A}$	$T_j = 25^\circ\text{C}$	2.1		V
			$T_j = 125^\circ\text{C}$	1.9		
t_{rr}	Reverse Recovery Time	$I_F = 400\text{A}$ $V_R = 600\text{V}$ $di/dt = 4000\text{A}/\mu\text{s}$	$T_j = 25^\circ\text{C}$	120		ns
			$T_j = 125^\circ\text{C}$	210		
Q_{rr}	Reverse Recovery Charge		$T_j = 25^\circ\text{C}$	26		μC
			$T_j = 125^\circ\text{C}$	64		
E_{rr}	Reverse Recovery Energy		$T_j = 25^\circ\text{C}$	16		mJ
			$T_j = 125^\circ\text{C}$	32		

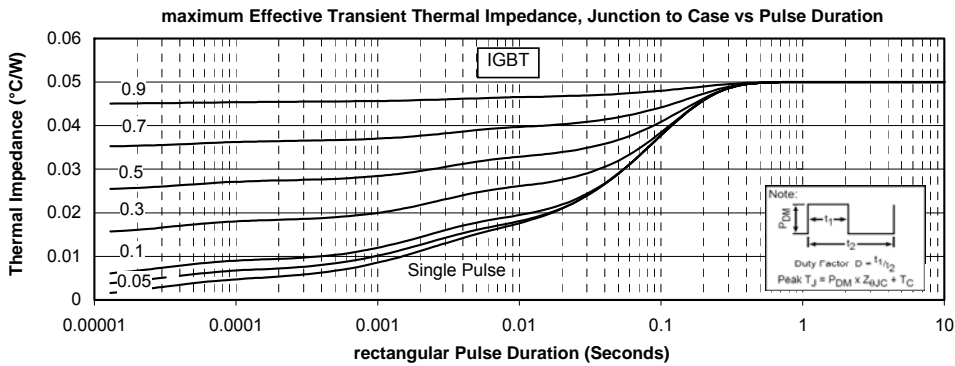
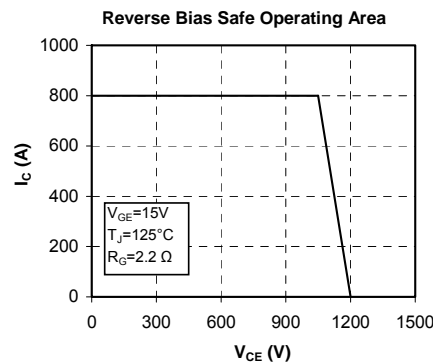
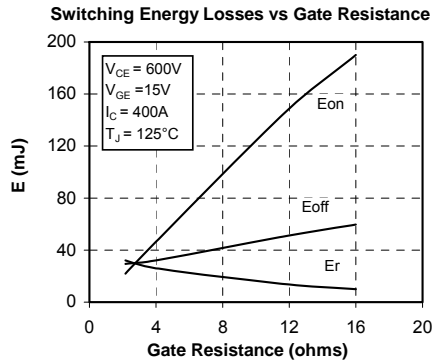
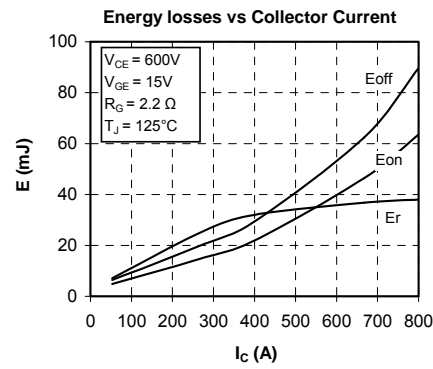
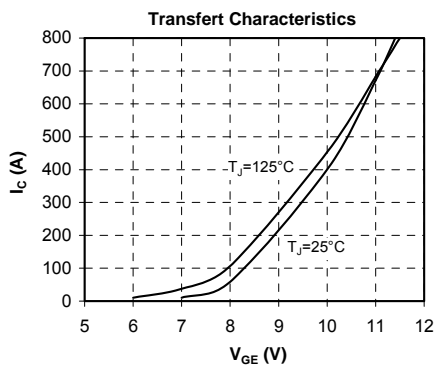
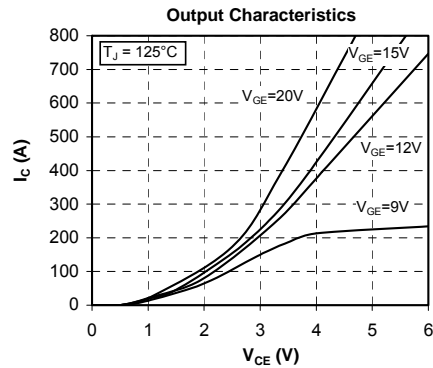
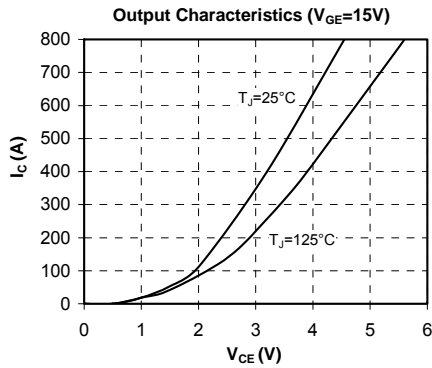
Thermal and package characteristics

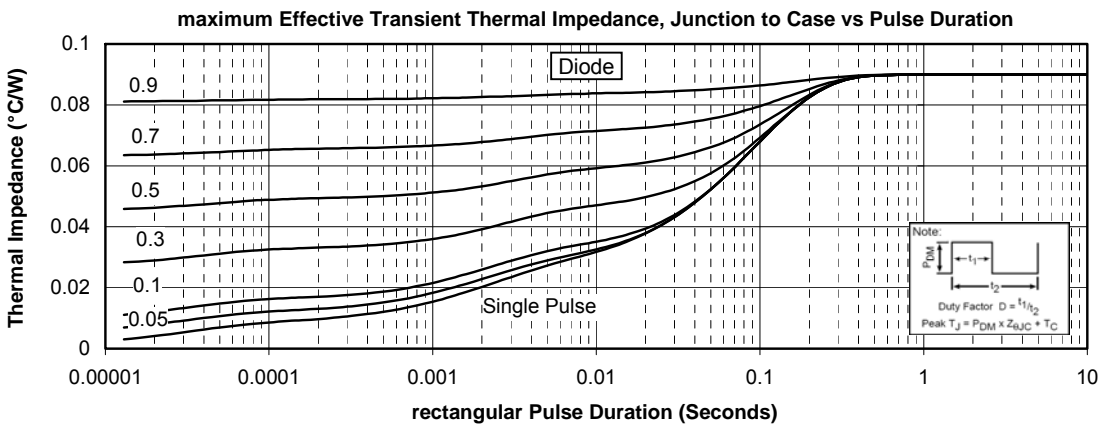
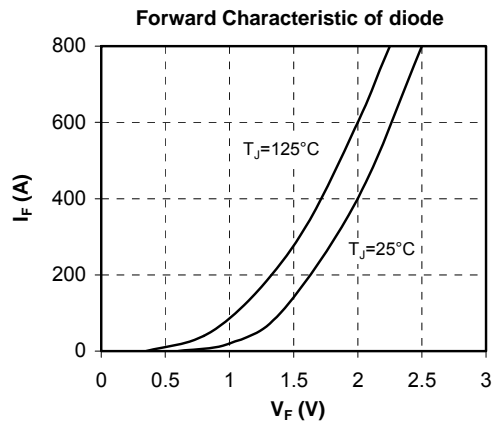
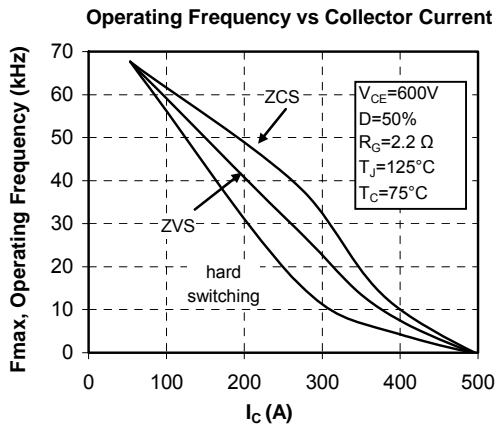
Symbol	Characteristic		Min	Typ	Max	Unit
R _{thJC}	Junction to Case Thermal Resistance	IGBT			0.05	°C/W
		Diode			0.09	
V _{ISOL}	RMS Isolation Voltage, any terminal to case t = 1 min, I _{isol} < 1mA, 50/60Hz		2500			V
T _J	Operating junction temperature range		-40		150	°C
T _{STG}	Storage Temperature Range		-40		125	
T _C	Operating Case Temperature		-40		125	
Torque	Mounting torque	M6	3		5	N.m
		M4	1		2	
Wt	Package Weight				350	g

D4 Package outline (dimensions in mm)



Typical Performance Curve





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