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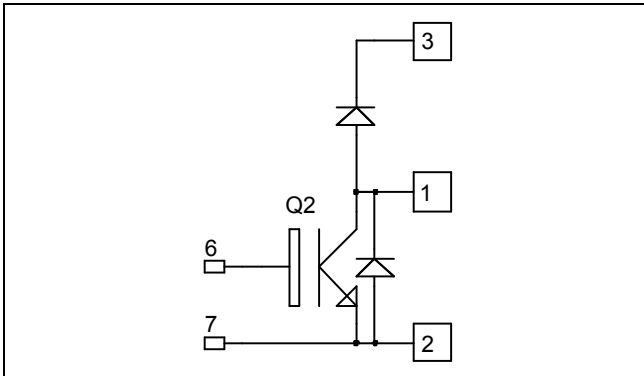
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**Boost chopper
Trench + Field Stop IGBT4
Power Module**

**$V_{CES} = 1200V$
 $I_C = 475A @ T_c = 80^\circ C$**


Application

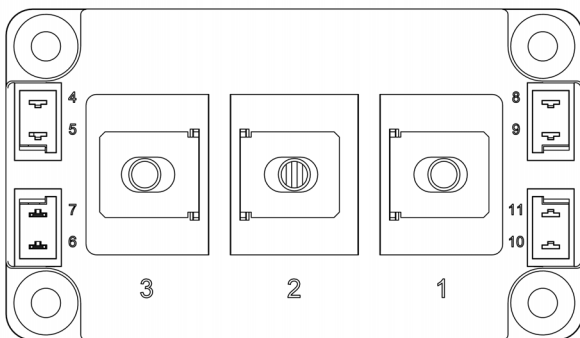
- AC and DC motor control
- Switched Mode Power Supplies
- Power Factor Correction

Features

- Trench + Field Stop IGBT 4 Technology
 - Low voltage drop
 - Low leakage current
 - Low switching losses
 - Soft recovery parallel diodes
 - Low diode VF
 - RBSOA and SCSOA rated
- Kelvin emitter for easy drive
- High level of integration
- M6 power connectors

Benefits

- 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	$T_C = 25^\circ C$	610
		$T_C = 80^\circ C$	475
I_{CM}	Pulsed Collector Current	$T_C = 25^\circ C$	900
V_{GE}	Gate - Emitter Voltage	± 20	V
P_D	Maximum Power Dissipation	$T_C = 25^\circ C$	2080
RBSOA	Reverse Bias Safe Operating Area	$T_j = 125^\circ C$	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	$V_{GE} = 15\text{V}$ $I_C = 400\text{A}$		$T_j = 25^\circ\text{C}$ 1.8 $T_j = 125^\circ\text{C}$ 2.2	2.2	V
$V_{GE(th)}$	Gate Threshold Voltage	$V_{GE} = V_{CE}, I_C = 15\text{mA}$	5.0	5.8	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	$V_{GE} = 0\text{V}$		24.6		nF
C_{oes}	Output Capacitance	$V_{CE} = 25\text{V}$		1.62		
C_{res}	Reverse Transfer Capacitance	$f = 1\text{MHz}$		1.38		
Q_G	Gate charge	$V_{GE} = -8\text{V} / 15\text{V}; V_{CE} = 600\text{V}$ $I_C = 400\text{A}$		2.3		μC
$T_{d(on)}$	Turn-on Delay Time	Inductive Switching (25°C) $V_{GE} = \pm 15\text{V}$ $V_{CE} = 600\text{V}$ $I_C = 400\text{A}$ $R_G = 1\Omega$		200		ns
T_r	Rise Time			40		
$T_{d(off)}$	Turn-off Delay Time			400		
T_f	Fall Time			70		
$T_{d(on)}$	Turn-on Delay Time	Inductive Switching (150°C) $V_{GE} = \pm 15\text{V}$ $V_{CE} = 600\text{V}$ $I_C = 400\text{A}$ $R_G = 1\Omega$		220		ns
T_r	Rise Time			50		
$T_{d(off)}$	Turn-off Delay Time			500		
T_f	Fall Time			80		
E_{on}	Turn-on Switching Energy	$V_{GE} = \pm 15\text{V}$ $V_{CE} = 600\text{V}$ $I_C = 400\text{A}$	$T_j = 150^\circ\text{C}$	33		mJ
E_{off}	Turn-off Switching Energy	$R_G = 1\Omega$	$T_j = 150^\circ\text{C}$	42		mJ
I_{sc}	Short Circuit data	$V_{GE} \leq 15\text{V}; V_{Bus} = 900\text{V}$ $t_p \leq 10\mu\text{s}; T_j = 150^\circ\text{C}$		1600		A

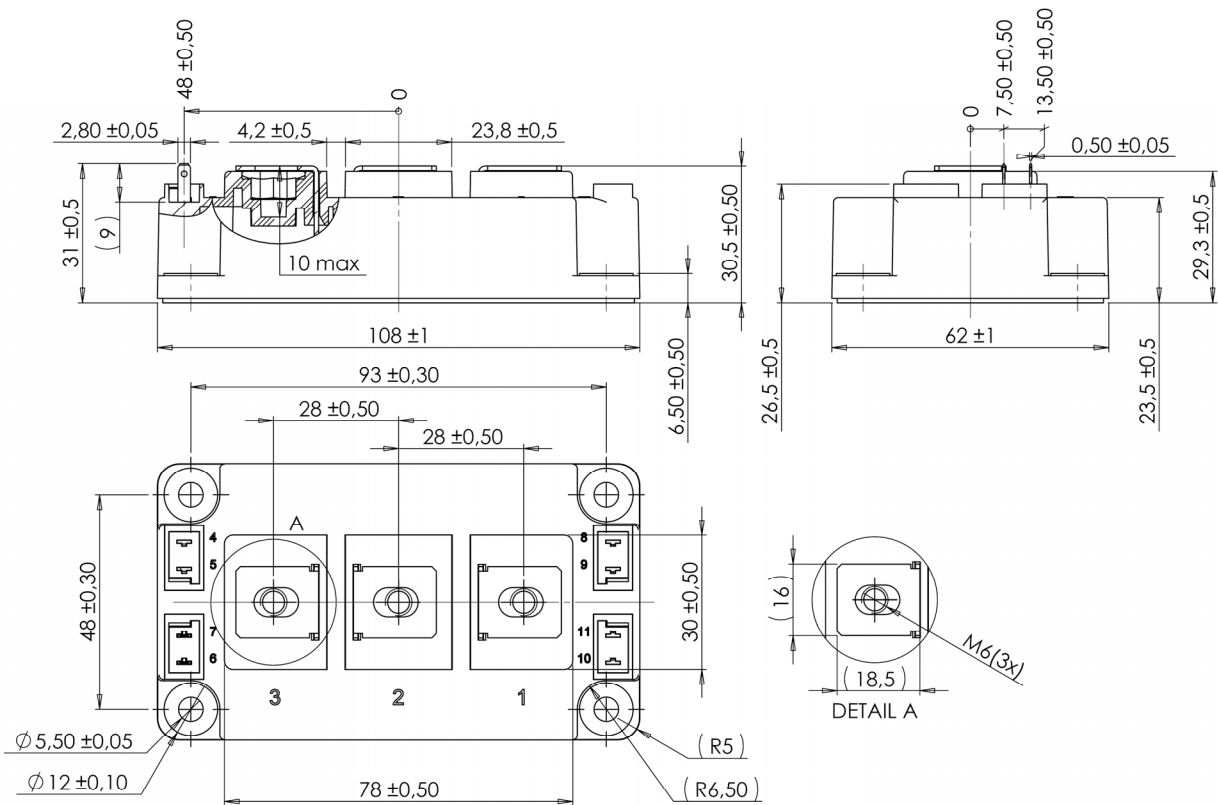
Diode ratings and characteristics

Symbol	Characteristic	Test Conditions	Min	Typ	Max	Unit
V_{RRM}	Maximum Repetitive Reverse Voltage		1200			V
I_{RRM}	Maximum Reverse Leakage Current	$V_R = 1200\text{V}$		$T_j = 25^\circ\text{C}$ $T_j = 150^\circ\text{C}$	250 2000	μA
I_F	DC Forward Current			$T_C = 80^\circ\text{C}$	400	A
V_F	Diode Forward Voltage	$I_F = 400\text{A}$ $V_{GE} = 0\text{V}$		$T_j = 25^\circ\text{C}$ $T_j = 150^\circ\text{C}$	1.7 1.65	V
t_{rr}	Reverse Recovery Time	$I_F = 400\text{A}$ $V_R = 600\text{V}$ $di/dt = 7000\text{A}/\mu\text{s}$		$T_j = 25^\circ\text{C}$ $T_j = 150^\circ\text{C}$	155 300	ns
Q_{rr}	Reverse Recovery Charge			$T_j = 25^\circ\text{C}$ $T_j = 150^\circ\text{C}$	37.2 78	μC
E_{rr}	Reverse Recovery Energy			$T_j = 25^\circ\text{C}$ $T_j = 150^\circ\text{C}$	16 32	mJ

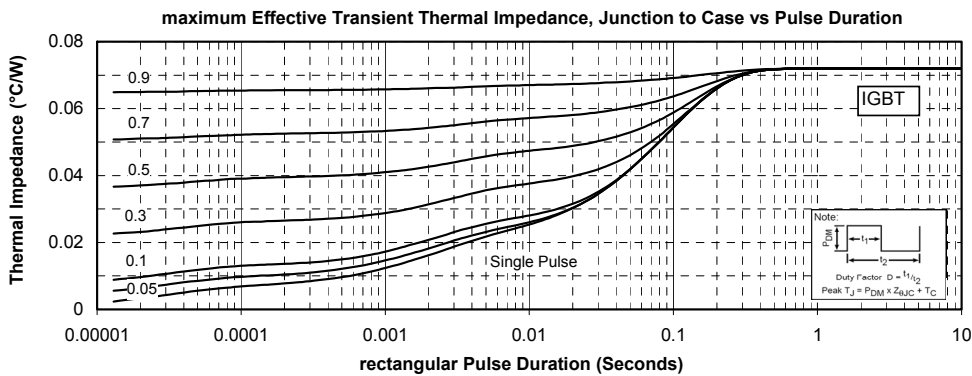
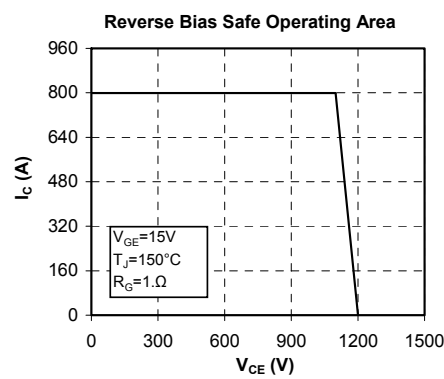
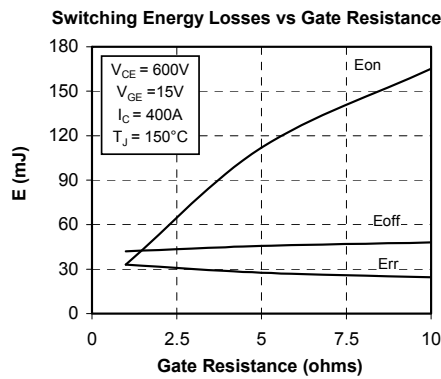
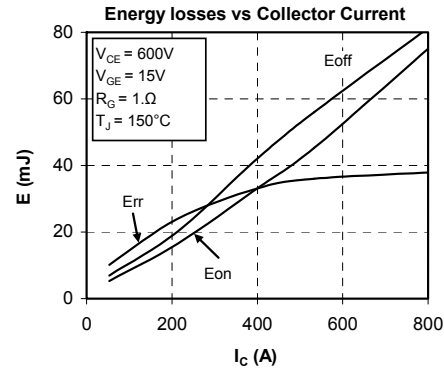
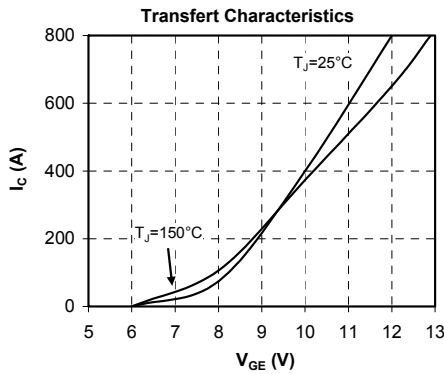
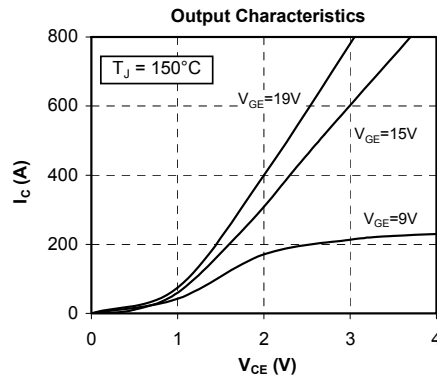
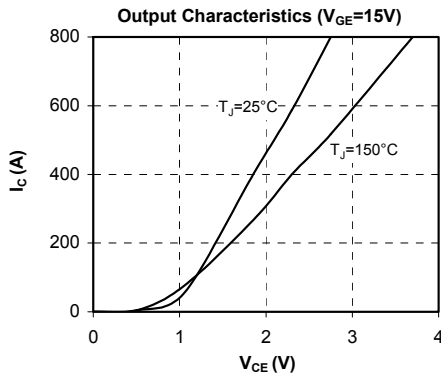
Thermal and package characteristics

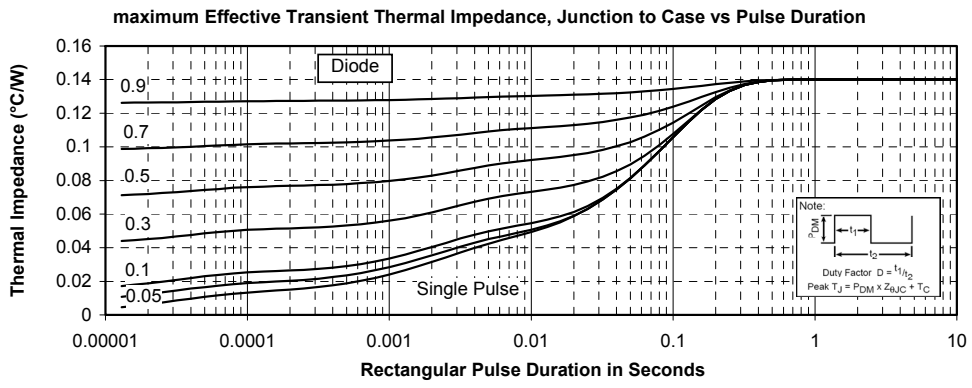
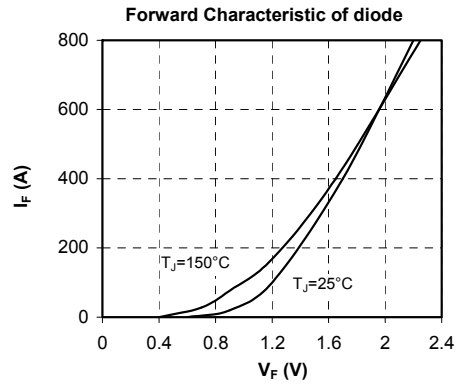
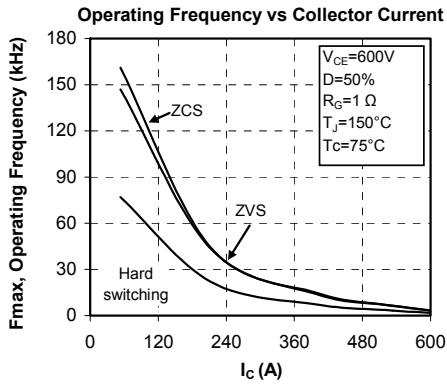
Symbol	Characteristic	Min	Typ	Max	Unit	
R _{thJC}	Junction to Case Thermal Resistance	IGBT		0.072	°C/W	
		Diode		0.14		
V _{ISOL}	RMS Isolation Voltage, any terminal to case t=1 min, 50/60Hz	4000			V	
T _J	Operating junction temperature range	-40		175	°C	
T _{STG}	Storage Temperature Range	-40		125		
T _C	Operating Case Temperature	-40		125		
Torque	Mounting torque	For terminals	M6	3	5	N.m
		To Heatsink	M6	3	5	
Wt	Package Weight			350	g	

D3 Package outline (dimensions in mm)



Typical Performance Curve





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