

阅读申明

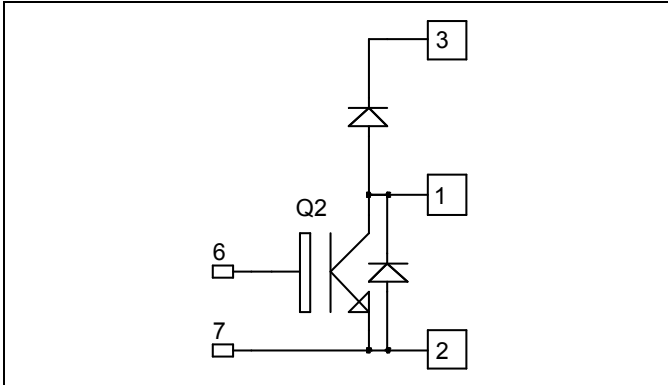
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**Boost chopper
Trench + Field Stop IGBT
Power Module**

**$V_{CES} = 1200V$
 $I_C = 100A @ T_c = 80^\circ C$**



Application

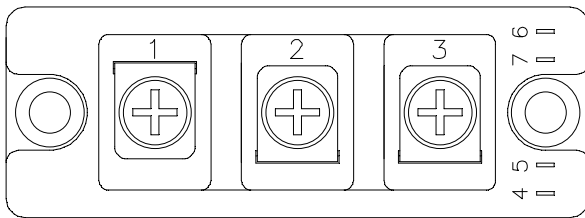
- AC and DC motor control
- Switched Mode Power Supplies
- Power Factor Correction

Features

- Trench + Field Stop IGBT Technology
 - Low voltage drop
 - Low tail current
 - Switching frequency up to 20 kHz
 - Soft recovery parallel diodes
 - Low diode VF
 - Low leakage current
 - RBSOA and SCSOA rated
- Kelvin emitter for easy drive
- High level of integration
- M5 power connectors

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 TC 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	$T_C = 25^\circ C$	150
		$T_C = 80^\circ C$	100
I_{CM}	Pulsed Collector Current	$T_C = 25^\circ C$	200
V_{GE}	Gate - Emitter Voltage	± 20	V
P_D	Maximum Power Dissipation	$T_C = 25^\circ C$	520
RBSOA	Reverse Bias Safe Operating Area	$T_j = 125^\circ C$	200A@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	$V_{GE} = 0\text{V}, V_{CE} = 1200\text{V}$			3	mA
$V_{CE(on)}$	Collector Emitter on Voltage	$V_{GE} = 15\text{V}$ $I_C = 100\text{A}$	$T_j = 25^\circ\text{C}$ $T_j = 125^\circ\text{C}$	1.4 2.0	1.7 2.1	V
$V_{GE(th)}$	Gate Threshold Voltage	$V_{GE} = V_{CE}, I_C = 4\text{mA}$	5.0	5.8	6.5	V
I_{GES}	Gate – Emitter Leakage Current	$V_{GE} = 20\text{V}, V_{CE} = 0\text{V}$			300	nA

Dynamic Characteristics

Symbol	Characteristic	Test Conditions	Min	Typ	Max	Unit
C_{ies}	Input Capacitance	$V_{GE} = 0\text{V}$		7		nF
C_{oes}	Output Capacitance	$V_{CE} = 25\text{V}$		0.4		
C_{res}	Reverse Transfer Capacitance	$f = 1\text{MHz}$		0.33		
Q_G	Gate charge	$V_{GE} = \pm 15\text{V}, I_C = 100\text{A}$ $V_{CE} = 600\text{V}$		950		nC
$T_{d(on)}$	Turn-on Delay Time	Inductive Switching (25°C)		250		ns
T_r	Rise Time	$V_{GE} = \pm 15\text{V}$		90		
$T_{d(off)}$	Turn-off Delay Time	$V_{Bus} = 600\text{V}$ $I_C = 100\text{A}$		550		
T_f	Fall Time	$R_G = 7.5\Omega$		130		
$T_{d(on)}$	Turn-on Delay Time	Inductive Switching (125°C)		300		ns
T_r	Rise Time	$V_{GE} = \pm 15\text{V}$		100		
$T_{d(off)}$	Turn-off Delay Time	$V_{Bus} = 600\text{V}$ $I_C = 100\text{A}$		650		
T_f	Fall Time	$R_G = 7.5\Omega$		180		
E_{on}	Turn on Energy	$V_{GE} = \pm 15\text{V}$ $V_{Bus} = 600\text{V}$	$T_j = 125^\circ\text{C}$	7.5		mJ
E_{off}	Turn off Energy	$I_C = 100\text{A}$ $R_G = 7.5\Omega$	$T_j = 125^\circ\text{C}$	17.5		
I_{sc}	Short Circuit data	$V_{GE} \leq 15\text{V}; V_{Bus} = 900\text{V}$ $t_p \leq 10\mu\text{s}; T_j = 125^\circ\text{C}$		400		A

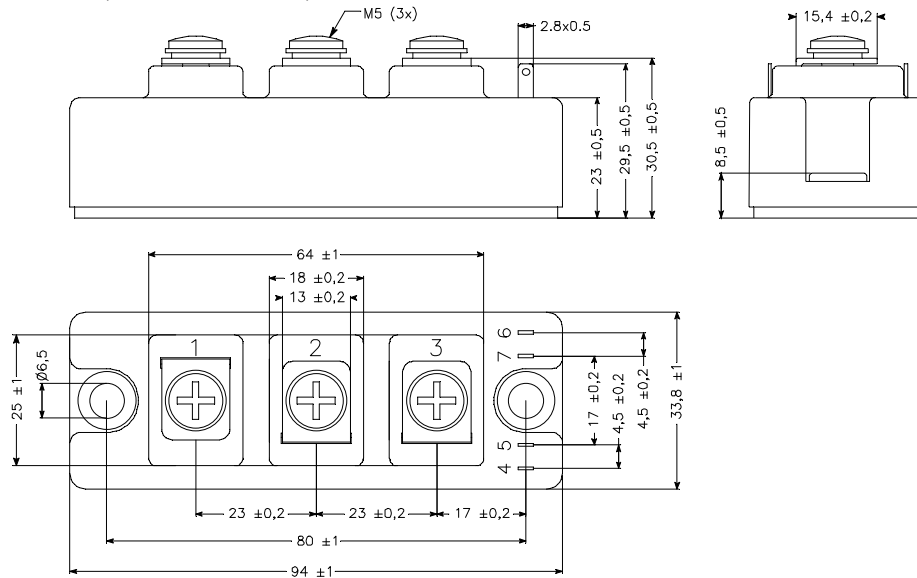
Chopper diode ratings and characteristics

Symbol	Characteristic	Test Conditions	Min	Typ	Max	Unit
V_{RRM}	Maximum Peak Repetitive Reverse Voltage		1200			V
I_{RRM}	Maximum Reverse Leakage Current	$V_R = 1200\text{V}$	$T_j = 25^\circ\text{C}$ $T_j = 125^\circ\text{C}$		250 500	μA
I_F	DC Forward Current			100		A
V_F	Diode Forward Voltage	$I_F = 100\text{A}$ $V_{GE} = 0\text{V}$	$T_j = 25^\circ\text{C}$ $T_j = 125^\circ\text{C}$	1.6 1.6	2.1	V
t_{rr}	Reverse Recovery Time	$I_F = 100\text{A}$ $V_R = 600\text{V}$ $di/dt = 2000\text{A}/\mu\text{s}$	$T_j = 25^\circ\text{C}$ $T_j = 125^\circ\text{C}$	170 280		ns
Q_{rr}	Reverse Recovery Charge		$T_j = 25^\circ\text{C}$ $T_j = 125^\circ\text{C}$	9 18		μC
E_{rr}	Reverse Recovery Energy		$T_j = 25^\circ\text{C}$ $T_j = 125^\circ\text{C}$	5 9		mJ

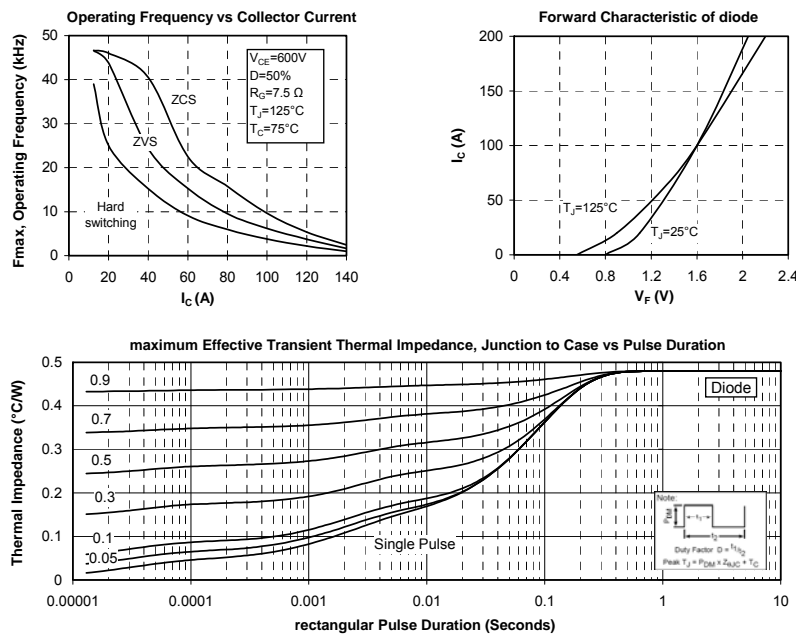
Thermal and package characteristics

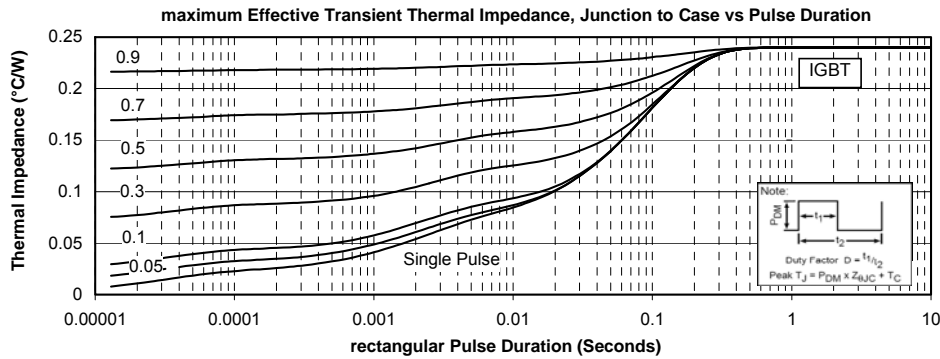
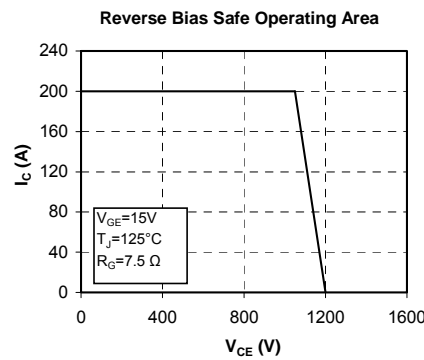
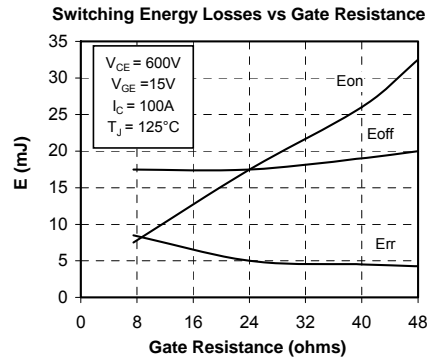
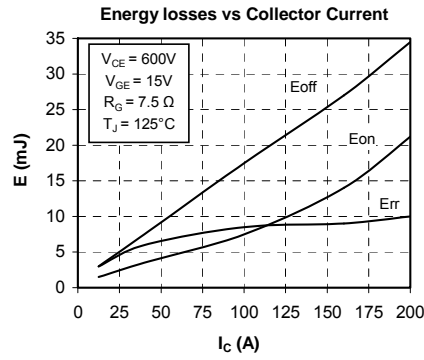
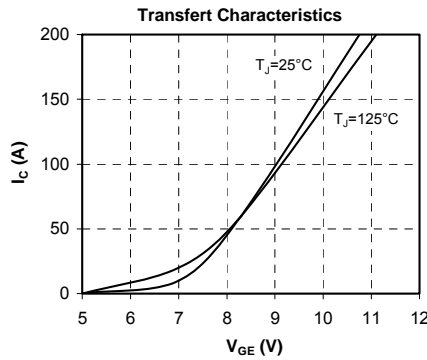
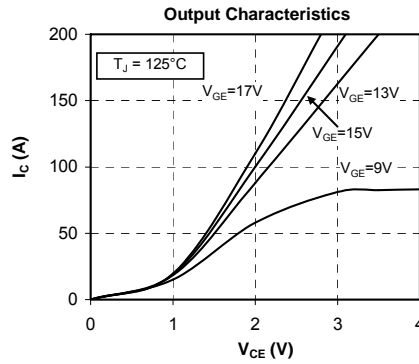
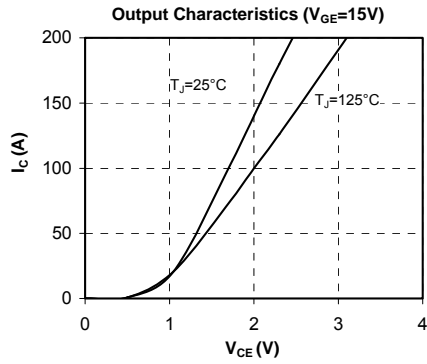
Symbol	Characteristic	Min	Typ	Max	Unit	
R_{thJC}	Junction to Case Thermal Resistance	IGBT		0.24	°C/W	
		Diode		0.48		
V_{ISOL}	RMS Isolation Voltage, any terminal to case t = 1 min, I isol < 1mA, 50/60Hz	4000			V	
T_J	Operating junction temperature range	-40		150	°C	
T_{STG}	Storage Temperature Range	-40		125		
T_C	Operating Case Temperature	-40		125		
Torque	Mounting torque	For terminals	M5	2	3.5	N.m
		To Heatsink	M6	3	5	
Wt	Package Weight			180	g	

D1 Package outline (dimensions in mm)



Typical Performance Curve





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