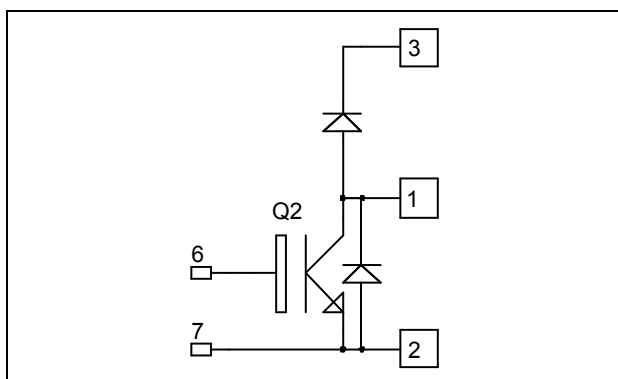


Boost chopper NPT IGBT Power Module

$V_{CES} = 600V$
 $I_C = 165A @ T_c = 80^\circ C$

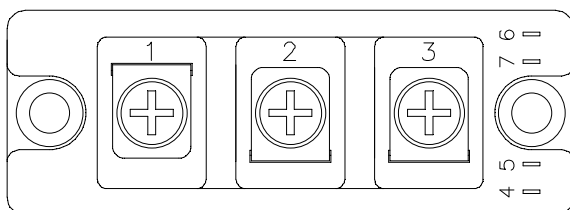


Application

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

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
- High level of integration
- M5 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	600	V
I_C	Continuous Collector Current	$T_C = 25^\circ C$ 230 $T_C = 80^\circ C$ 165	A
I_{CM}	Pulsed Collector Current	$T_C = 25^\circ C$ 400	
V_{GE}	Gate - Emitter Voltage	± 20	V
P_D	Maximum Power Dissipation	$T_C = 25^\circ C$ 781	W
RBSOA	Reverse Bias Safe Operating Area	$T_j = 125^\circ C$ 400A@420V	



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	$V_{GE} = 0V$ $V_{CE} = 600V$	$T_j = 25^\circ\text{C}$		250	μA
			$T_j = 125^\circ\text{C}$		500	
$V_{CE(sat)}$	Collector Emitter saturation Voltage	$V_{GE} = 15V$ $I_C = 200A$	$T_j = 25^\circ\text{C}$	1.95	2.45	V
			$T_j = 125^\circ\text{C}$	2.2		
$V_{GE(th)}$	Gate Threshold Voltage	$V_{GE} = V_{CE}, I_C = 4\text{mA}$	4.5		6.5	V
I_{GES}	Gate – Emitter Leakage Current	$V_{GE} = 20V, V_{CE} = 0V$			400	nA

Dynamic Characteristics

Symbol	Characteristic	Test Conditions	Min	Typ	Max	Unit
C_{ies}	Input Capacitance	$V_{GE} = 0V, V_{CE} = 25V$		9000		pF
C_{res}	Reverse Transfer Capacitance	$f = 1\text{MHz}$		800		
Q_G	Gate charge	$V_{GE} = 15V, I_C = 200A$ $V_{CE} = 300V$		650		nC
$T_{d(on)}$	Turn-on Delay Time	Inductive Switching (25°C)		150		ns
T_r	Rise Time	$V_{GE} = \pm 15V$		72		
$T_{d(off)}$	Turn-off Delay Time	$V_{Bus} = 300V$		530		
T_f	Fall Time	$I_C = 200A$ $R_G = 16\Omega$		40		
$T_{d(on)}$	Turn-on Delay Time	Inductive Switching (125°C)		160		ns
T_r	Rise Time	$V_{GE} = \pm 15V$		75		
$T_{d(off)}$	Turn-off Delay Time	$V_{Bus} = 300V$		550		
T_f	Fall Time	$I_C = 200A$ $R_G = 16\Omega$		50		
E_{on}	Turn on energy	$V_{GE} = \pm 15V$ $V_{Bus} = 300V$	$T_j = 125^\circ\text{C}$	9		mJ
E_{off}	Turn off energy	$I_C = 200A$ $R_G = 16\Omega$	$T_j = 125^\circ\text{C}$	8.5		
I_{sc}	Short Circuit data	$V_{GE} \leq 15V; V_{Bus} = 360V$ $t_p \leq 10\mu\text{s}; T_j = 125^\circ\text{C}$		900		A

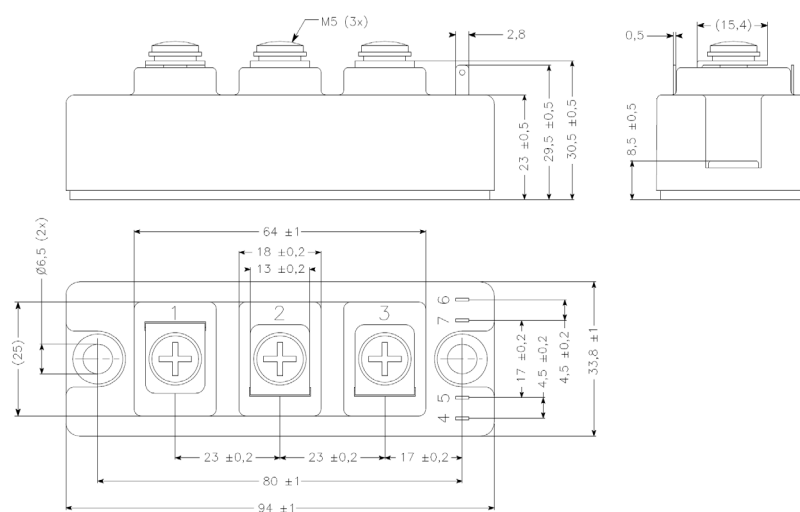
Chopper Diode ratings and characteristics

Symbol	Characteristic	Test Conditions	Min	Typ	Max	Unit
V_{RRM}	Maximum Peak Repetitive Reverse Voltage		600			V
I_{RM}	Maximum Reverse Leakage Current	$V_R = 600V$	$T_j = 25^\circ\text{C}$		100	μA
			$T_j = 125^\circ\text{C}$		500	
I_F	DC Forward Current		$T_c = 80^\circ\text{C}$	200		A
V_F	Diode Forward Voltage	$I_F = 200A$ $V_{GE} = 0V$	$T_j = 25^\circ\text{C}$	1.25	1.6	V
			$T_j = 125^\circ\text{C}$	1.2		
t_{rr}	Reverse Recovery time	$I_F = 200A$ $V_R = 300V$ $di/dt = 3500A/\mu\text{s}$	$T_j = 25^\circ\text{C}$	150		ns
			$T_j = 125^\circ\text{C}$	250		
Q_{rr}	Reverse Recovery Charge		$T_j = 25^\circ\text{C}$	13		μC
			$T_j = 125^\circ\text{C}$	20		
E_{rr}	Reverse Recovery Energy		$T_j = 25^\circ\text{C}$	2.9		mJ
			$T_j = 125^\circ\text{C}$	5.7		

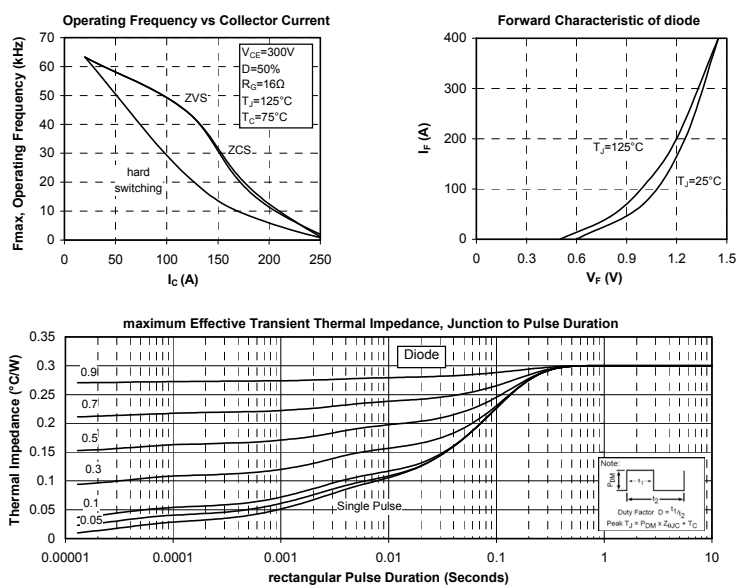
Thermal and package characteristics

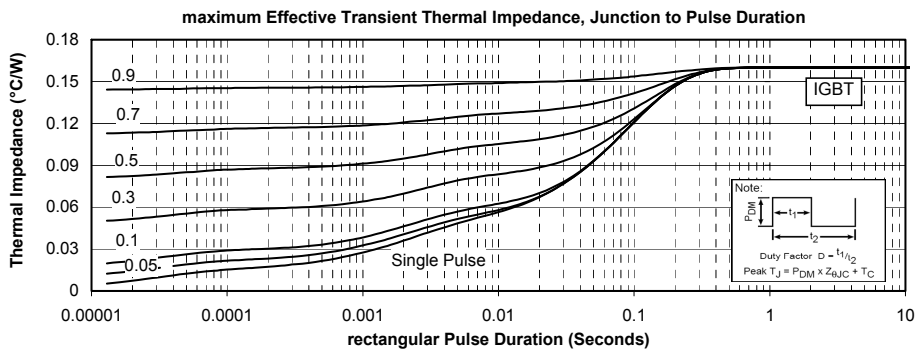
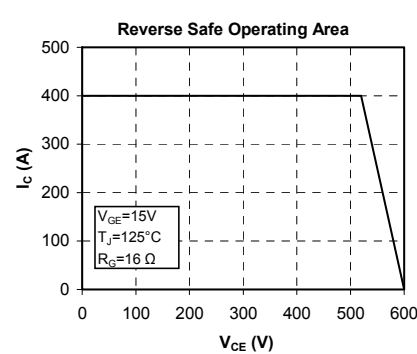
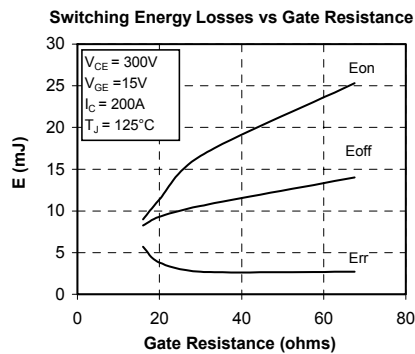
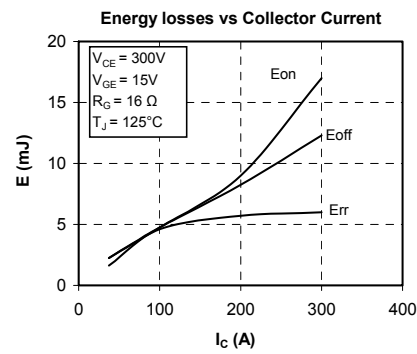
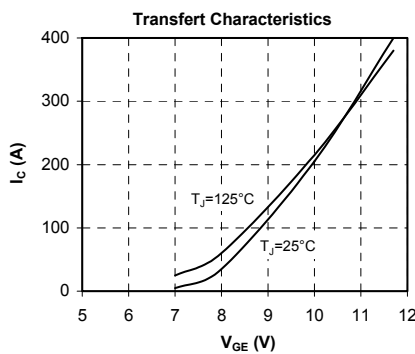
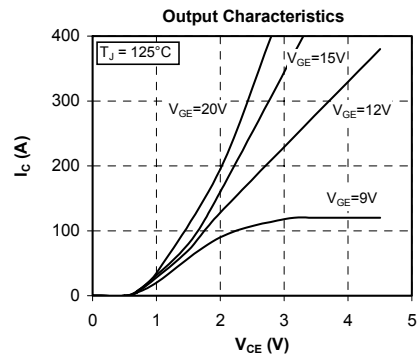
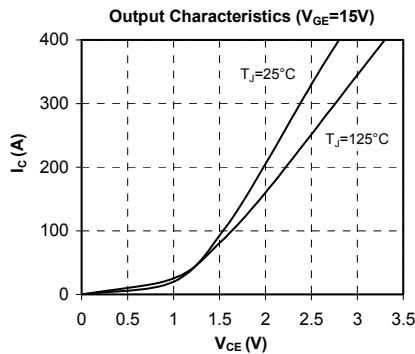
Symbol	Characteristic	Min	Typ	Max	Unit
R _{thJC}	Junction to Case Thermal Resistance	IGBT		0.16	°C/W
		Diode		0.30	
V _{ISOL}	RMS Isolation Voltage, any terminal to case t = 1 min, 50/60Hz	4000			V
T _J	Operating junction temperature range	-40		150	°C
T _{STG}	Storage Temperature Range	-40		125	
T _C	Operating Case Temperature	-40		125	
Torque	Mounting torque	For terminals	M5	2	N.m
		To Heatsink	M6	3	
Wt	Package Weight			180	g

D1 Package outline (dimensions in mm)



Typical Performance Curve





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