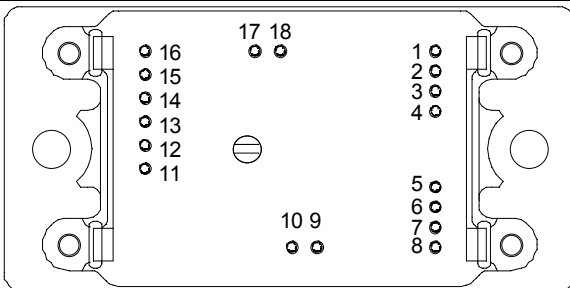
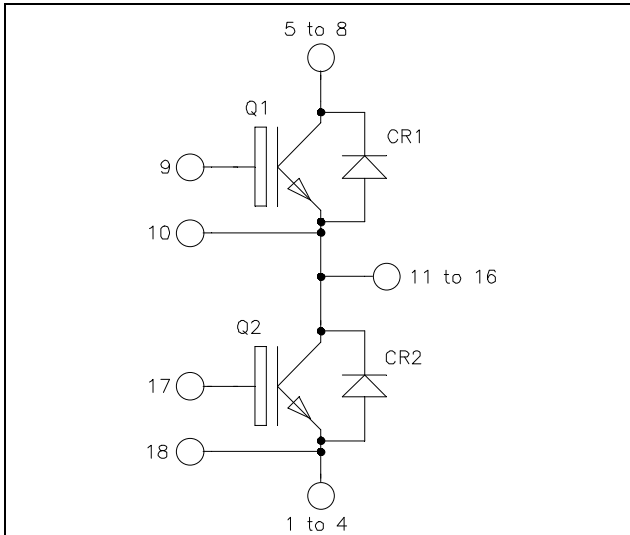


**Phase leg
Trench + Field Stop IGBT3
Power Module**

**$V_{CES} = 600V$
 $I_C = 200A @ T_c = 80^\circ C$**



Pins 1/2/3/4 ; 5/6/7/8 ; 11/12/13/14/15/16
must be shorted together

Application

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

Features

- Fast Trench + Field Stop IGBT3 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
- Very low stray inductance
- 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

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

Absolute maximum ratings

Symbol	Parameter	Max ratings	Unit
V_{CES}	Collector - Emitter Breakdown Voltage	600	V
I_C	Continuous Collector Current	$T_c = 25^\circ C$	290
		$T_c = 80^\circ C$	200
I_{CM}	Pulsed Collector Current	$T_c = 25^\circ C$	400
V_{GE}	Gate - Emitter Voltage	± 20	V
P_D	Maximum Power Dissipation	$T_c = 25^\circ C$	625
RBSOA	Reverse Bias Safe Operating Area	$T_j = 150^\circ C$	400A @ 550V

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

Electrical Characteristics

Symbol	Characteristic	Test Conditions	Min	Typ	Max	Unit
I _{CES}	Zero Gate Voltage Collector Current	V _{GE} = 0V, V _{CE} = 600V			50	μA
V _{CE(sat)}	Collector Emitter Saturation Voltage	V _{GE} = 15V I _C = 200A		1.5 1.7	1.9	V
V _{GE(th)}	Gate Threshold Voltage	V _{GE} = V _{CE} , I _C = 2 mA	5.0	5.8	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		12.3		nF
C _{oes}	Output Capacitance	V _{CE} = 25V		0.8		
C _{res}	Reverse Transfer Capacitance	f = 1MHz		0.4		
Q _G	Gate charge	V _{GE} = ±15V, I _C = 200A V _{CE} = 300V		2.1		μC
T _{d(on)}	Turn-on Delay Time	Inductive Switching (25°C) V _{GE} = ±15V V _{Bus} = 300V I _C = 200A R _G = 2Ω		115		ns
T _r	Rise Time			45		
T _{d(off)}	Turn-off Delay Time			225		
T _f	Fall Time			55		
T _{d(on)}	Turn-on Delay Time	Inductive Switching (150°C) V _{GE} = ±15V V _{Bus} = 300V I _C = 200A R _G = 2Ω		130		ns
T _r	Rise Time			50		
T _{d(off)}	Turn-off Delay Time			300		
T _f	Fall Time			70		
E _{on}	Turn on Energy	V _{GE} = ±15V V _{Bus} = 300V		1 1.8		mJ
E _{off}	Turn off Energy	I _C = 200A R _G = 2Ω		5.7 7		
I _{sc}	Short Circuit data	V _{GE} ≤ 15V ; V _{Bus} = 360V t _p ≤ 6μs ; T _j = 150°C		1000		A
R _{thJC}	Junction to Case Thermal Resistance				0.24	°C/W

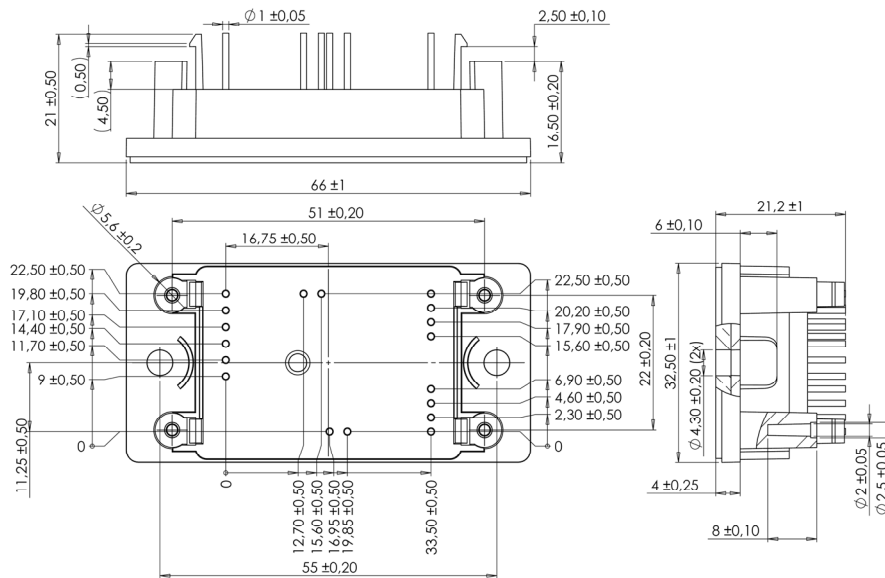
Reverse diode ratings and characteristics

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			50	μA
I _F	DC Forward Current			200		A
V _F	Diode Forward Voltage	I _F = 200A V _{GE} = 0V		1.6 1.5	2	V
t _{rr}	Reverse Recovery Time	I _F = 200A V _R = 300V di/dt = 2200A/μs		130 225		ns
Q _{rr}	Reverse Recovery Charge			9 19		
Er	Reverse Recovery Energy			2.3 4.7		
R _{thJC}	Junction to Case Thermal Resistance				0.4	°C/W

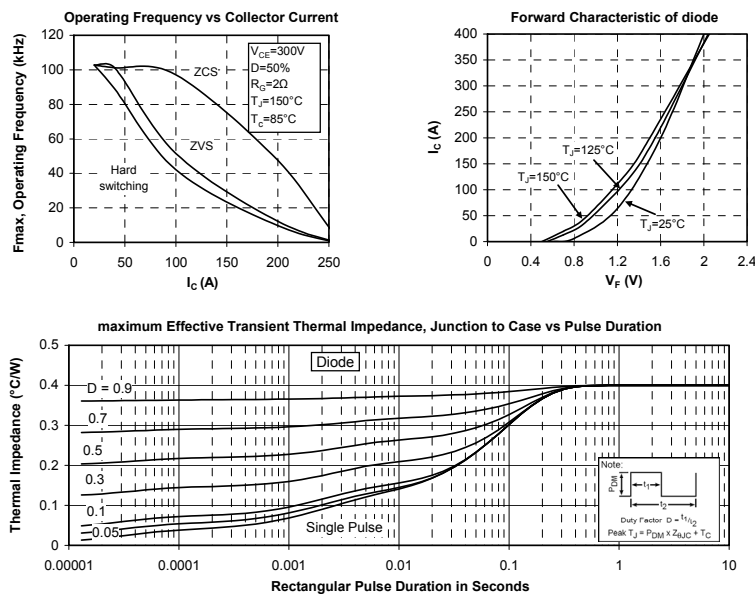
Thermal and package characteristics

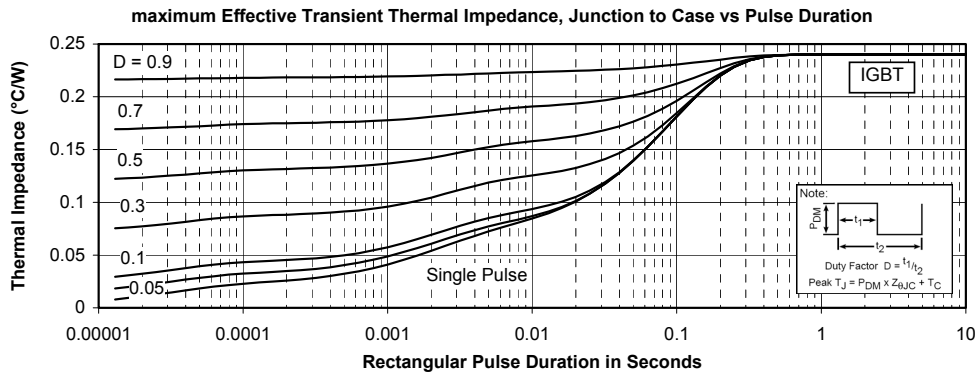
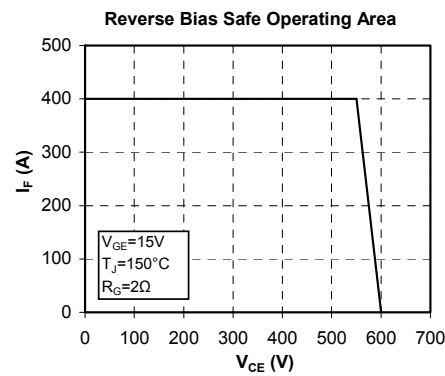
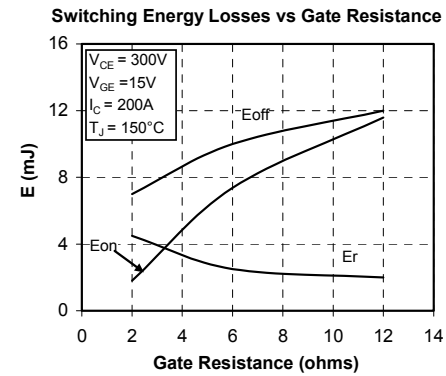
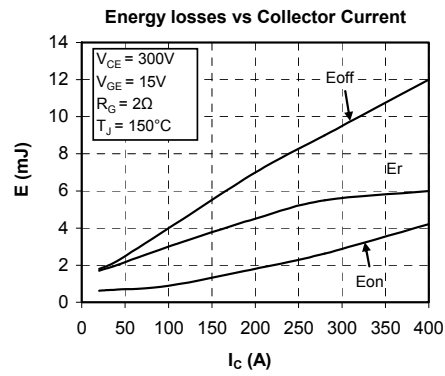
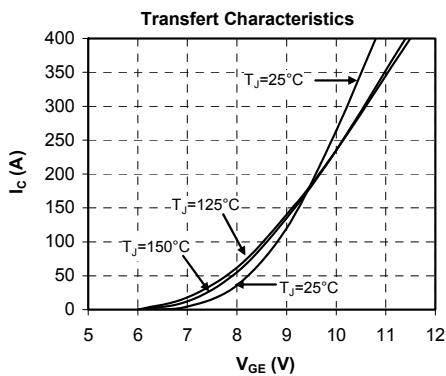
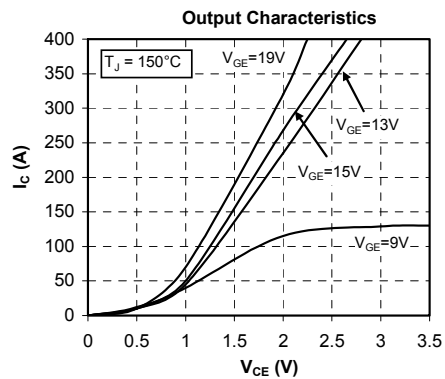
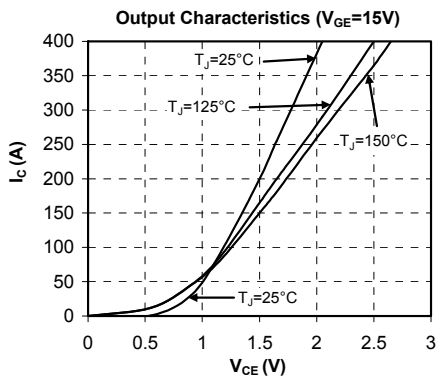
Symbol	Characteristic	Min	Typ	Max	Unit	
V _{ISOL}	RMS Isolation Voltage, any terminal to case t=1 min, 50/60Hz	4000			V	
T _J	Operating junction temperature range	-40		175	°C	
T _{STG}	Storage Temperature Range	-40		125		
T _C	Operating Case Temperature	-40		100		
Torque	Mounting torque	To heatsink	M4	2	3	N.m
Wt	Package Weight				75	g

SP2 Package outline (dimensions in mm)



Typical Performance Curve





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