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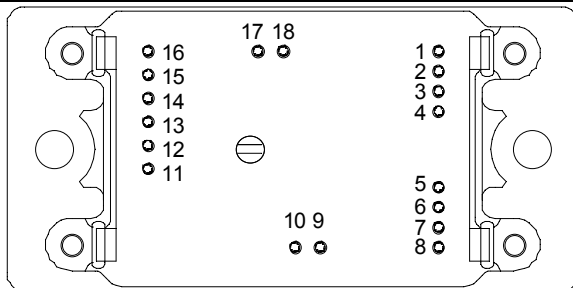
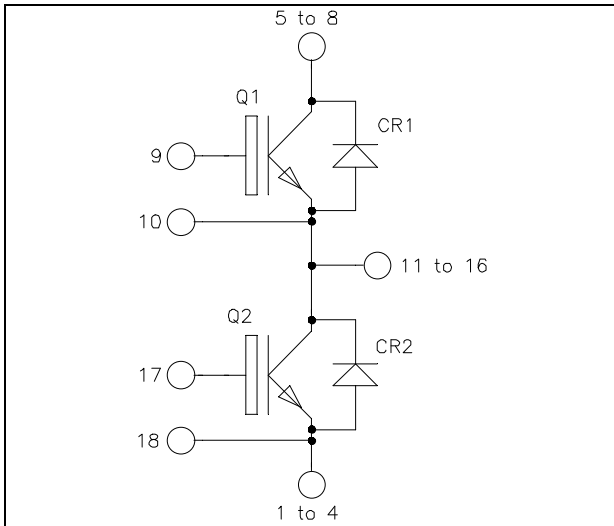
Email & Skype: info@chipsmall.com Web: www.chipsmall.com

Address: A1208, Overseas Decoration Building, #122 Zhenhua RD., Futian, Shenzhen, China



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

**$V_{CES} = 1200V$
 $I_C = 50A @ T_c = 80^{\circ}C$**



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	1200	V
I_C	Continuous Collector Current	$T_C = 25^{\circ}C$	75
		$T_C = 80^{\circ}C$	50
I_{CM}	Pulsed Collector Current	$T_C = 25^{\circ}C$	100
V_{GE}	Gate - Emitter Voltage	± 20	V
P_D	Maximum Power Dissipation	$T_C = 25^{\circ}C$	277
RBSOA	Reverse Bias Safe Operating Area	$T_J = 125^{\circ}C$	100A @ 1150V

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

Electrical Characteristics

<i>Symbol</i>	<i>Characteristic</i>	<i>Test Conditions</i>	<i>Min</i>	<i>Typ</i>	<i>Max</i>	<i>Unit</i>	
I_{CES}	Zero Gate Voltage Collector Current	$V_{GE} = 0V, V_{CE} = 1200V$			50	μA	
$V_{CE(sat)}$	Collector Emitter Saturation Voltage	$V_{GE} = 15V, I_C = 50A$	$T_j = 25^\circ C$	1.4	1.7	2.1	V
			$T_j = 125^\circ C$		2.0		
$V_{GE(th)}$	Gate Threshold Voltage	$V_{GE} = V_{CE}, I_C = 2mA$	5.0	5.8	6.5	V	
I_{GES}	Gate – Emitter Leakage Current	$V_{GE} = 20V, V_{CE} = 0V$			400	nA	

Dynamic Characteristics

<i>Symbol</i>	<i>Characteristic</i>	<i>Test Conditions</i>	<i>Min</i>	<i>Typ</i>	<i>Max</i>	<i>Unit</i>
C_{ies}	Input Capacitance	$V_{GE} = 0V, V_{CE} = 25V$ $f = 1MHz$		3600		pF
C_{rss}	Reverse Transfer Capacitance			160		
Q_G	Gate charge	$V_{GE} = \pm 15V, I_C = 50A$ $V_{CE} = 600V$		0.47		μC
$T_{d(on)}$	Turn-on Delay Time	Inductive Switching ($25^\circ C$) $V_{GE} = \pm 15V$ $V_{Bus} = 600V$ $I_C = 50A$ $R_G = 18\Omega$		90		ns
T_r	Rise Time			30		
$T_{d(off)}$	Turn-off Delay Time			420		
T_f	Fall Time			70		
$T_{d(on)}$	Turn-on Delay Time	Inductive Switching ($125^\circ C$) $V_{GE} = \pm 15V$ $V_{Bus} = 600V$ $I_C = 50A$ $R_G = 18\Omega$		90		ns
T_r	Rise Time			50		
$T_{d(off)}$	Turn-off Delay Time			520		
T_f	Fall Time			90		
E_{on}	Turn-on Switching Energy	$V_{GE} = \pm 15V$ $V_{Bus} = 600V$ $I_C = 50A$ $R_G = 18\Omega$	$T_j = 125^\circ C$		5	mJ
E_{off}	Turn-off Switching Energy			$T_j = 125^\circ C$	5.5	
I_{sc}	Short Circuit data	$V_{GE} \leq 15V; V_{Bus} = 900V$ $t_p \leq 10\mu s; T_j = 125^\circ C$		200		A
R_{thJC}	Junction to Case Thermal Resistance				0.45	$^\circ C/W$

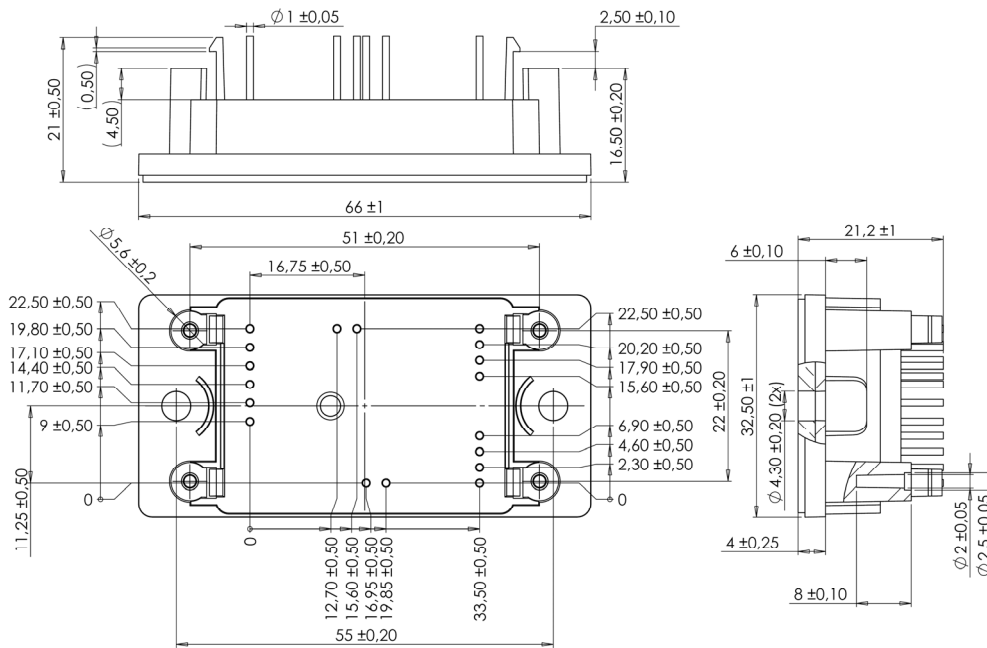
Reverse diode ratings and characteristics

<i>Symbol</i>	<i>Characteristic</i>	<i>Test Conditions</i>	<i>Min</i>	<i>Typ</i>	<i>Max</i>	<i>Unit</i>	
V_{RRM}	Maximum Peak Repetitive Reverse Voltage		1200			V	
I_{RM}	Maximum Reverse Leakage Current	$V_R = 1200V$			50	μA	
I_F	DC Forward Current	$T_c = 80^\circ C$		50		A	
V_F	Diode Forward Voltage	$I_F = 50A$	$T_j = 25^\circ C$		1.6	2.1	V
			$T_j = 125^\circ C$		1.6		
t_{rr}	Reverse Recovery Time	$I_F = 50A$ $V_R = 600V$ $di/dt = 1900A/\mu s$	$T_j = 25^\circ C$		170		ns
			$T_j = 125^\circ C$		280		
Q_{rr}	Reverse Recovery Charge		$T_j = 25^\circ C$		5.6		μC
			$T_j = 125^\circ C$		9.9		
E_r	Reverse Recovery Energy		$T_j = 25^\circ C$		2.2		mJ
			$T_j = 125^\circ C$		4.1		
R_{thJC}	Junction to Case Thermal Resistance				0.72	$^\circ C/W$	

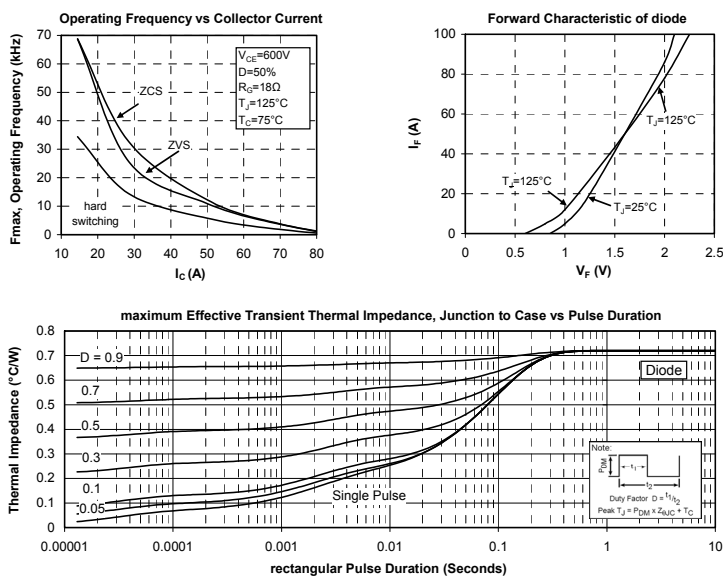
Thermal and package characteristics

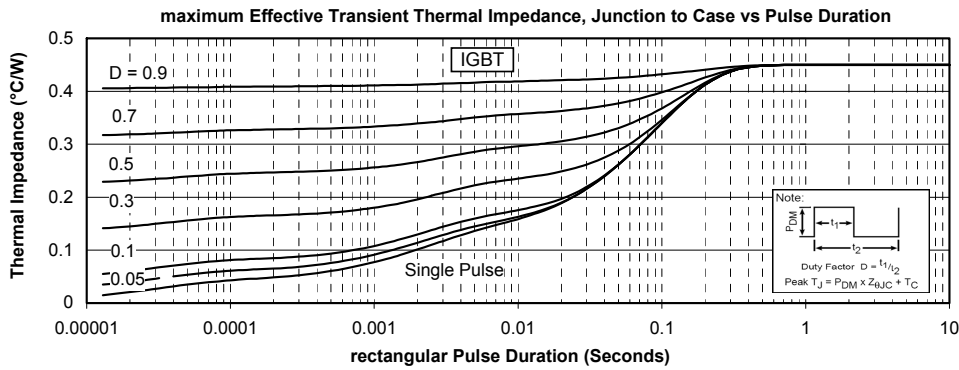
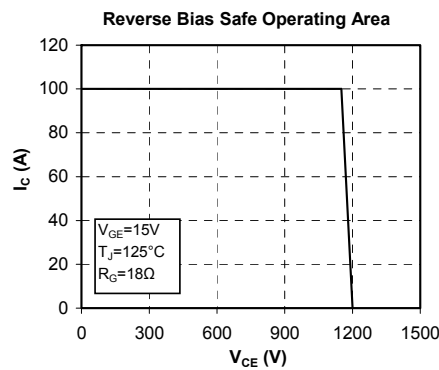
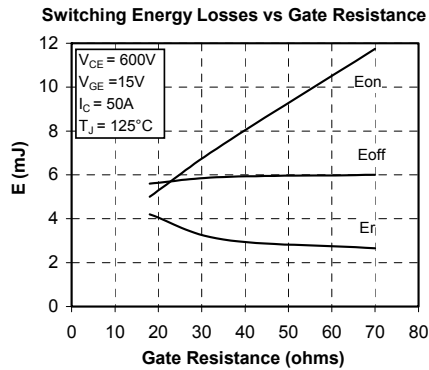
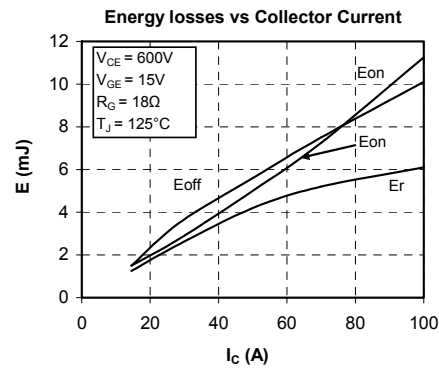
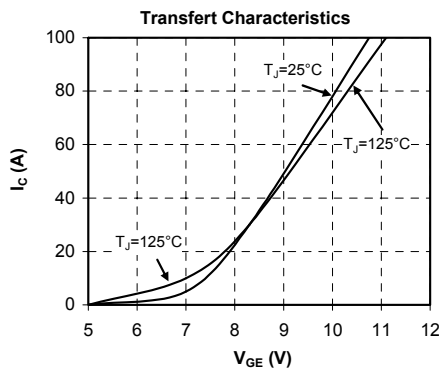
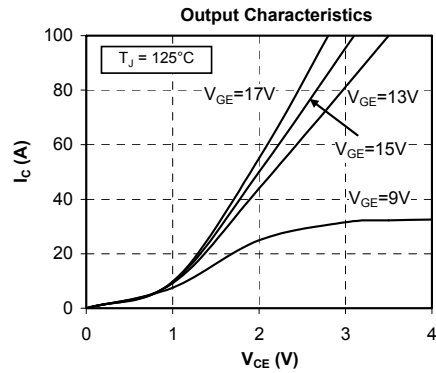
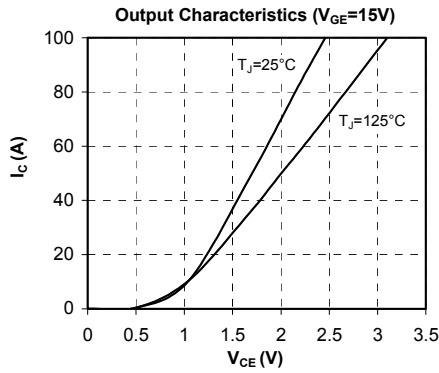
Symbol	Characteristic	Min	Typ	Max	Unit	
V _{ISOL}	RMS Isolation Voltage, any terminal to case t=1 min, 50/60Hz	4000			V	
T _J	Operating junction temperature range	-40		150	°C	
T _{STG}	Storage Temperature Range	-40		125		
T _C	Operating Case Temperature	-40		100		
Torque	Mounting torque	To heatsink	M4	2	3	N.m
Wt	Package Weight				75	g

SP2 Package outline (dimensions in mm)



Typical Performance Curve





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