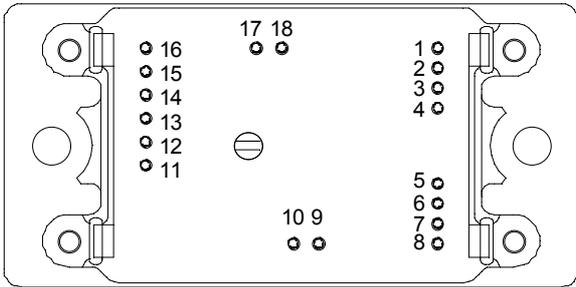
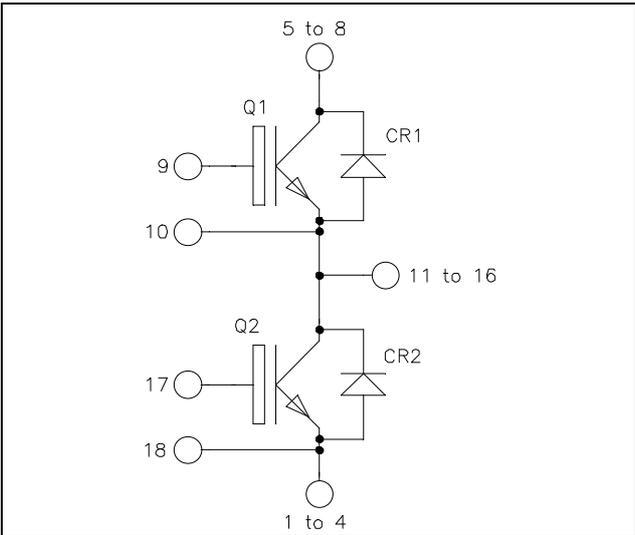


Phase leg
Fast Trench + Field Stop IGBT3
Power Module

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



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	$T_C = 25^\circ C$	140
		$T_C = 80^\circ C$	100
I_{CM}	Pulsed Collector Current	$T_C = 25^\circ C$	200
V_{GE}	Gate - Emitter Voltage	± 20	V
P_D	Maximum Power Dissipation	$T_C = 25^\circ C$	480
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

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	$V_{GE} = 15V$ $I_C = 100A$	$T_j = 25^\circ C$ 1.4	$T_j = 25^\circ C$ 1.7	2.1	V
				2.0		
$V_{GE(th)}$	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

<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	$V_{GE} = 0V$		7200		pF
C_{oes}	Output Capacitance	$V_{CE} = 25V$		400		
C_{res}	Reverse Transfer Capacitance	$f = 1MHz$		300		
Q_G	Gate charge	$V_{GE} = \pm 15V, I_C = 100A$ $V_{CE} = 600V$		0.9		μC
$T_{d(on)}$	Turn-on Delay Time	Inductive Switching (25°C) $V_{GE} = \pm 15V$ $V_{Bus} = 600V$ $I_C = 100A$ $R_G = 3.9\Omega$		260		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°C) $V_{GE} = \pm 15V$ $V_{Bus} = 600V$ $I_C = 100A$ $R_G = 3.9\Omega$		290		ns
T_r	Rise Time			50		
$T_{d(off)}$	Turn-off Delay Time			520		
T_f	Fall Time			90		
E_{on}	Turn on Energy	$V_{GE} = \pm 15V$ $V_{Bus} = 600V$	$T_j = 125^\circ C$	10		mJ
E_{off}	Turn off Energy	$I_C = 100A$ $R_G = 3.9\Omega$		$T_j = 125^\circ C$	10	
I_{sc}	Short Circuit data	$V_{GE} \leq 15V ; V_{Bus} = 900V$ $t_p \leq 10\mu s ; T_j = 125^\circ C$		400		A
R_{thJC}	Junction to Case Thermal Resistance				0.26	$^\circ C/W$

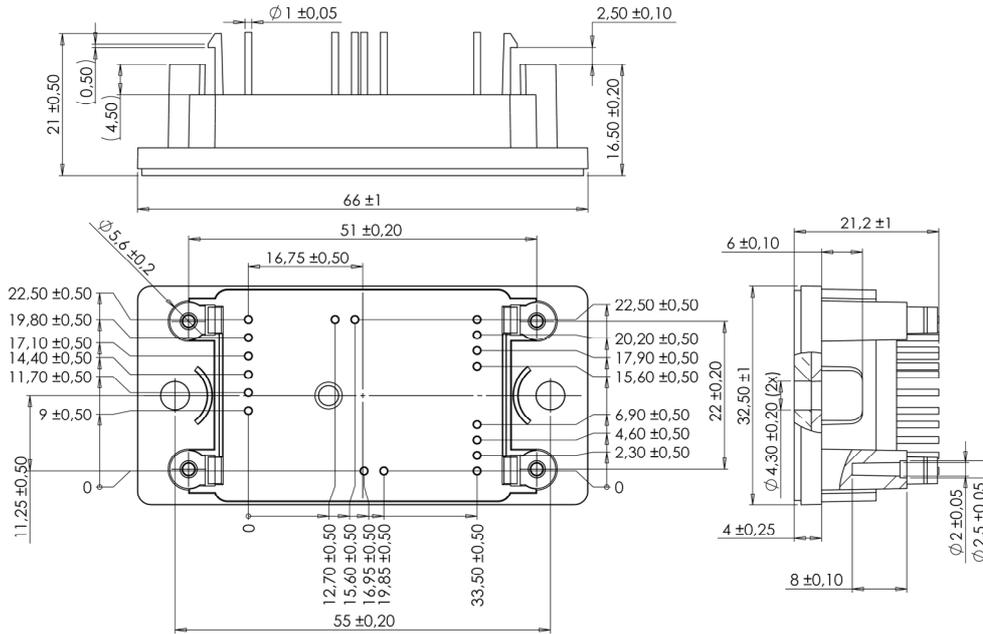
Reverse diode ratings and characteristics

<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	$T_c = 80^\circ C$		100		A
V_F	Diode Forward Voltage	$I_F = 100A$ $V_{GE} = 0V$	$T_j = 25^\circ C$	1.6	2.1	V
			$T_j = 125^\circ C$	1.6		
t_{rr}	Reverse Recovery Time	$I_F = 100A$ $V_R = 600V$ $di/dt = 2000A/\mu s$	$T_j = 25^\circ C$	170		ns
			$T_j = 125^\circ C$	280		
Q_{rr}	Reverse Recovery Charge	$I_F = 100A$ $V_R = 600V$ $di/dt = 2000A/\mu s$	$T_j = 25^\circ C$	9		μC
			$T_j = 125^\circ C$	18		
E_r	Reverse Recovery Energy	$I_F = 100A$ $V_R = 600V$ $di/dt = 2000A/\mu s$	$T_j = 25^\circ C$	5		mJ
			$T_j = 125^\circ C$	9		
R_{thJC}	Junction to Case Thermal Resistance				0.48	$^\circ C/W$

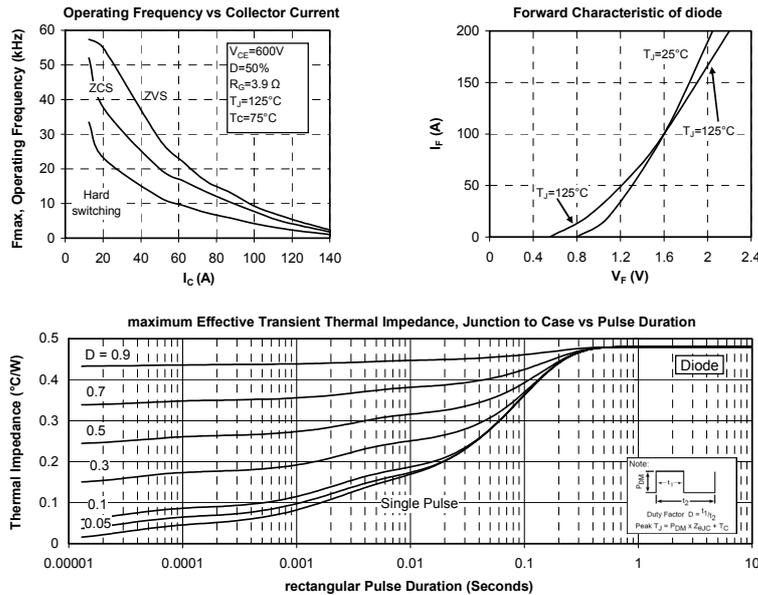
Thermal and package characteristics

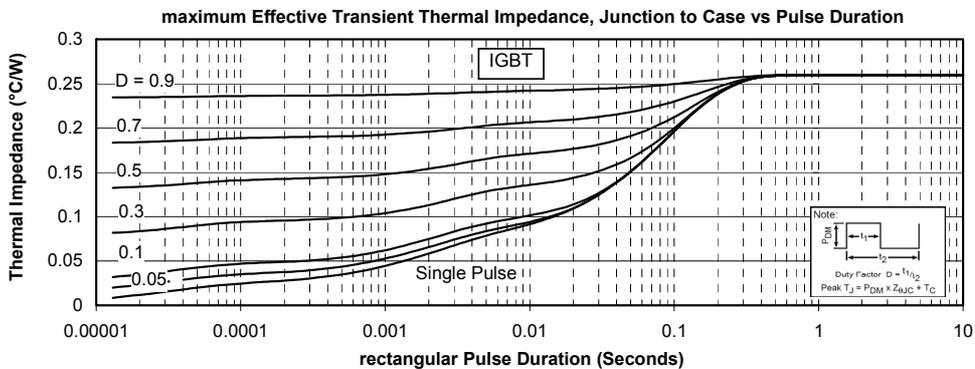
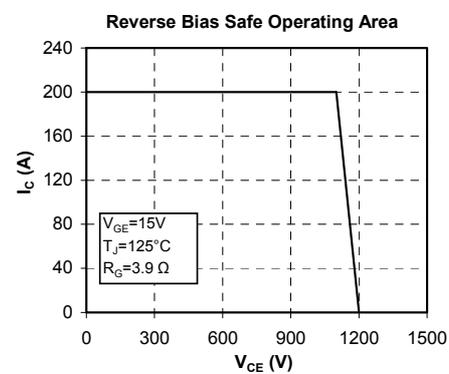
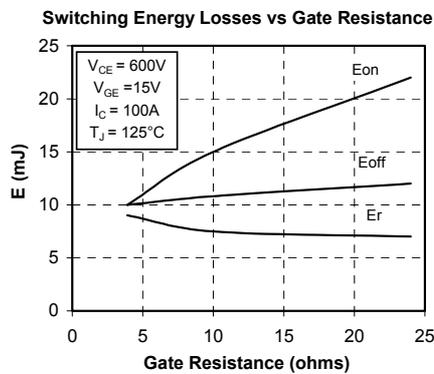
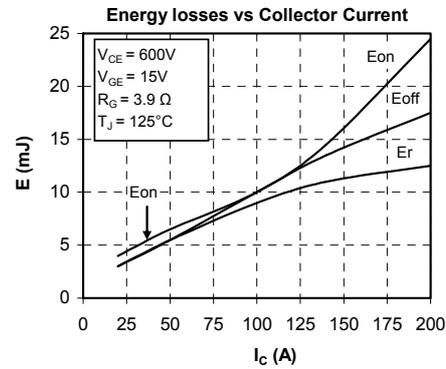
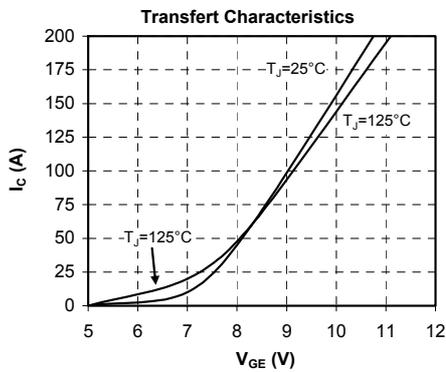
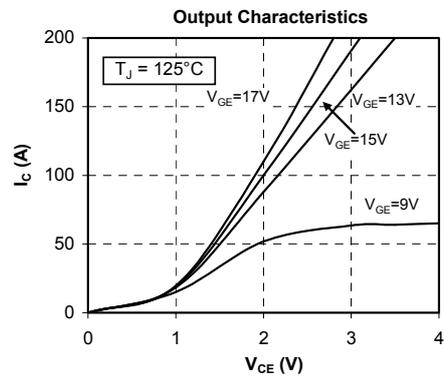
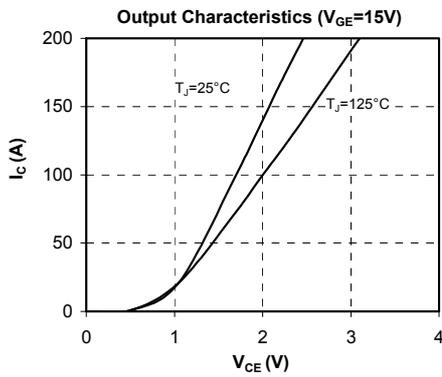
Symbol	Characteristic	Min	Typ	Max	Unit	
V _{ISOL}	RMS Isolation Voltage, any terminal to case t=1 min, 50/60Hz	4000			V	
T _J	Operating junction temperature range	-40		150	°C	
T _{STG}	Storage Temperature Range	-40		125		
T _C	Operating Case Temperature	-40		100		
Torque	Mounting torque	To heatsink	M4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

SP2 Package outline (dimensions in mm)



Typical Performance Curve





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