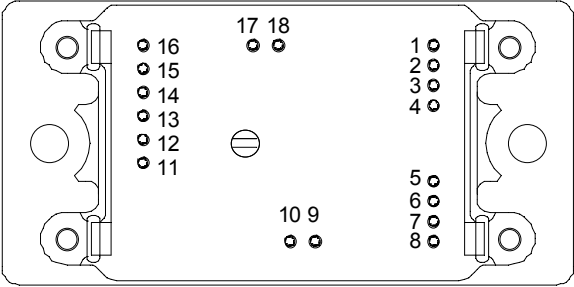
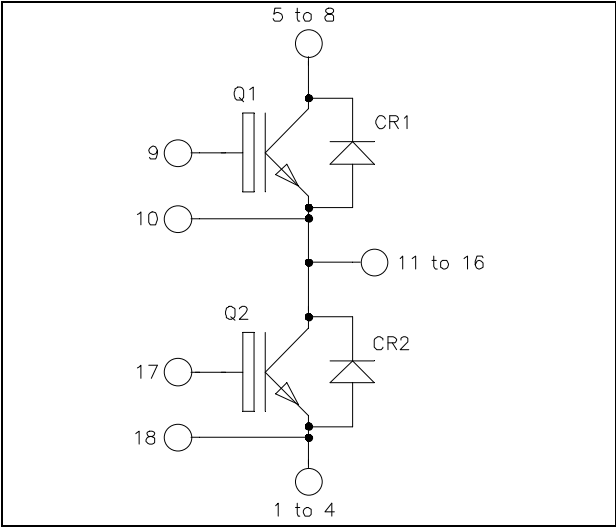


**Phase leg**  
**Fast Trench + Field Stop IGBT3**  
**Power Module**

**$V_{CES} = 1200V$**   
 **$I_C = 75A @ T_c = 80^\circ C$**



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**

<i>Symbol</i>	<i>Parameter</i>	<i>Max ratings</i>	<i>Unit</i>
$V_{CES}$	Collector - Emitter Breakdown Voltage	1200	V
$I_C$	Continuous Collector Current	$T_C = 25^\circ C$	110
		$T_C = 80^\circ C$	75
$I_{CM}$	Pulsed Collector Current	$T_C = 25^\circ C$	175
$V_{GE}$	Gate - Emitter Voltage	$\pm 20$	V
$P_D$	Maximum Power Dissipation	$T_C = 25^\circ C$	357
RBSOA	Reverse Bias Safe Operating Area	$T_j = 125^\circ C$	150A @ 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**

Symbol	Characteristic	Test Conditions	Min	Typ	Max	Unit
$I_{CES}$	Zero Gate Voltage Collector Current	$V_{GE} = 0V, V_{CE} = 1200V$			50	$\mu A$
$V_{CE(sat)}$	Collector Emitter saturation Voltage	$V_{GE} = 15V$ $I_C = 75A$	$T_j = 25^\circ C$ $T_j = 125^\circ C$	1.4 2.0	2.1	V
$V_{GE(th)}$	Gate Threshold Voltage	$V_{GE} = V_{CE}, I_C = 3 mA$		5.0	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	$V_{GE} = 0V$		5340		pF
$C_{oes}$	Output Capacitance	$V_{CE} = 25V$		280		
$C_{res}$	Reverse Transfer Capacitance	$f = 1MHz$		240		
$Q_G$	Gate charge	$V_{GE} = \pm 15V, I_C = 75A$ $V_{CE} = 600V$		0.70		$\mu C$
$T_{d(on)}$	Turn-on Delay Time	Inductive Switching ( $25^\circ C$ ) $V_{GE} = \pm 15V$ $V_{Bus} = 600V$ $I_C = 75A$ $R_G = 4.7\Omega$		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 ( $125^\circ C$ ) $V_{GE} = \pm 15V$ $V_{Bus} = 600V$ $I_C = 75A$ $R_G = 4.7\Omega$		285		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	$V_{GE} = \pm 15V$ $V_{Bus} = 600V$	$T_j = 125^\circ C$	7		mJ
$E_{off}$	Turn-off Switching Energy	$I_C = 75A$ $R_G = 4.7\Omega$		$T_j = 125^\circ C$	8.1	
$I_{sc}$	Short Circuit data	$V_{GE} \leq 15V; V_{Bus} = 900V$ $t_p \leq 10\mu s; T_j = 125^\circ C$		300		A
$R_{thJC}$	Junction to Case Thermal Resistance				0.35	$^\circ C/W$

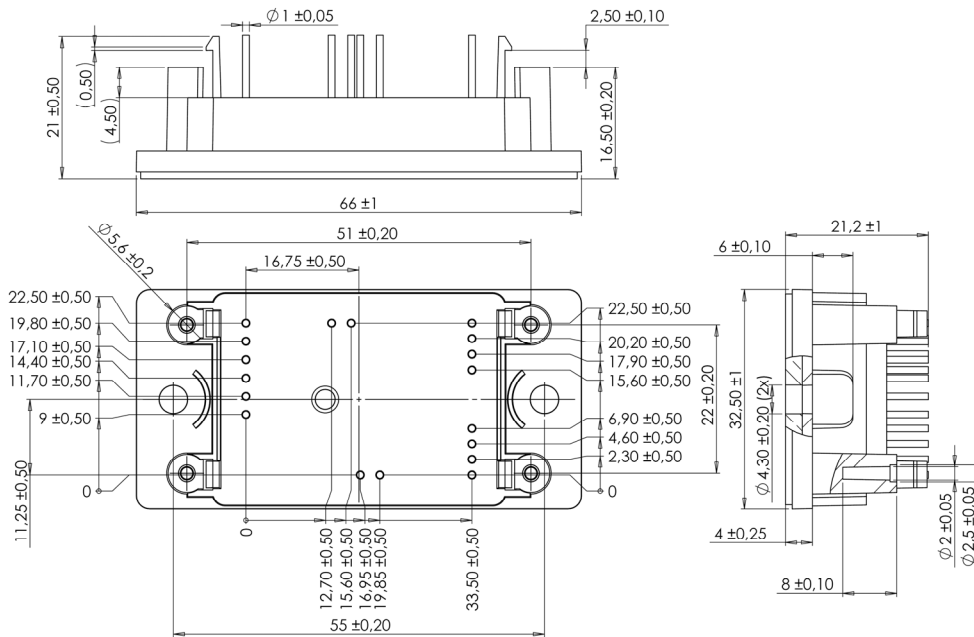
**Reverse diode ratings and characteristics**

Symbol	Characteristic	Test Conditions	Min	Typ	Max	Unit	
$V_{RRM}$	Maximum Peak Repetitive Reverse Voltage		1200			V	
$I_{RM}$	Maximum Reverse Leakage Current	$V_R = 1200V$			50	$\mu A$	
$I_F$	DC Forward Current	$T_c = 80^\circ C$		75		A	
$V_F$	Diode Forward Voltage	$I_F = 75A$	$T_j = 25^\circ C$ $T_j = 125^\circ C$	1.6 1.6	2.1	V	
$t_{rr}$	Reverse Recovery Time	$I_F = 75A$ $V_R = 600V$ $di/dt = 2000A/\mu s$	$T_j = 25^\circ C$ $T_j = 125^\circ C$	170 280		ns	
$Q_{rr}$	Reverse Recovery Charge		$T_j = 25^\circ C$ $T_j = 125^\circ C$	7 14		$\mu C$	
$E_r$	Reverse Recovery Energy		$T_j = 25^\circ C$ $T_j = 125^\circ C$	2.8 5.4		mJ	
$R_{thJC}$	Junction to Case Thermal Resistance					0.58	$^\circ C/W$

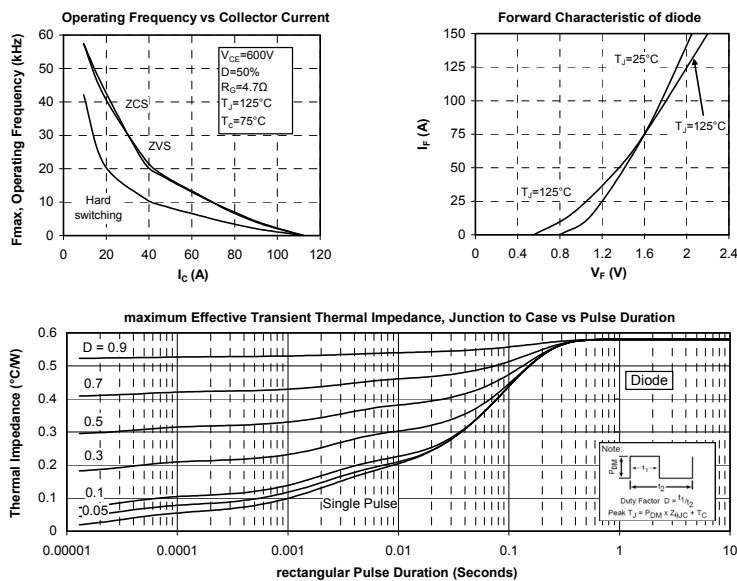
## Thermal and package characteristics

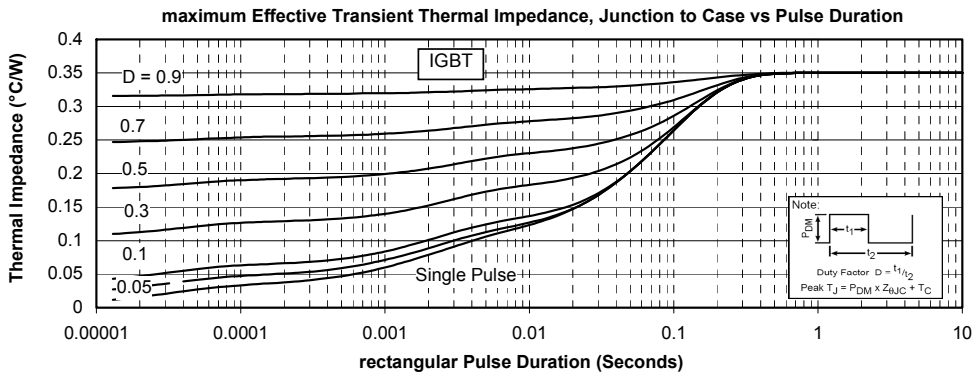
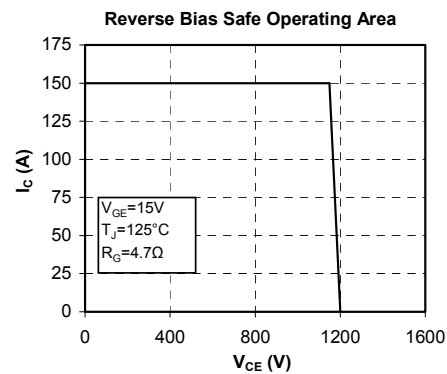
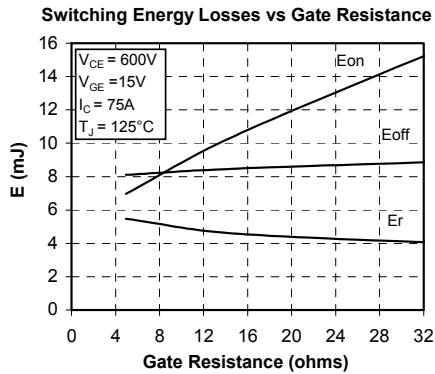
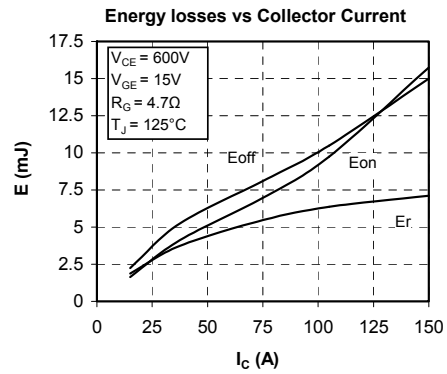
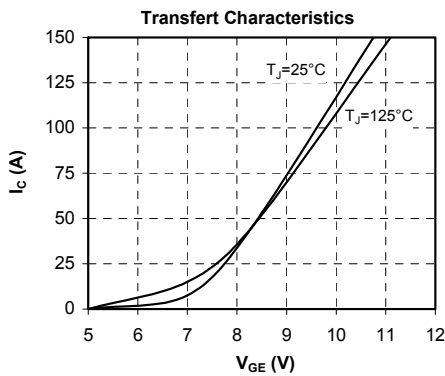
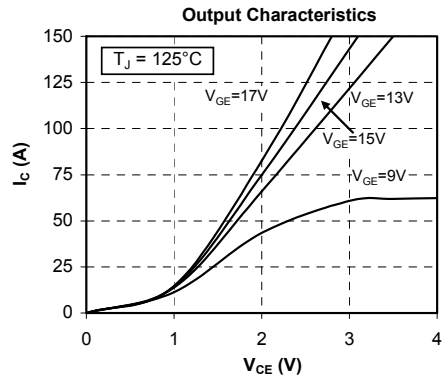
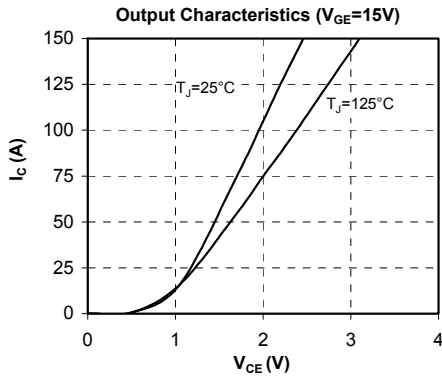
Symbol	Characteristic	Min	Typ	Max	Unit	
V <sub>ISOL</sub>	RMS Isolation Voltage, any terminal to case t=1 min, 50/60Hz	4000			V	
T <sub>J</sub>	Operating junction temperature range	-40		150	°C	
T <sub>STG</sub>	Storage Temperature Range	-40		125		
T <sub>C</sub>	Operating Case Temperature	-40		100		
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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