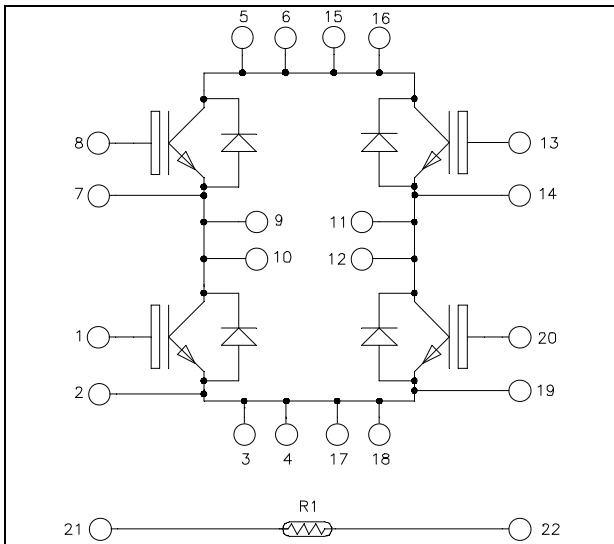


## Full - Bridge NPT IGBT Power Module

**$V_{CES} = 1200V$**   
 **$I_C = 25A @ T_c = 80^\circ C$**

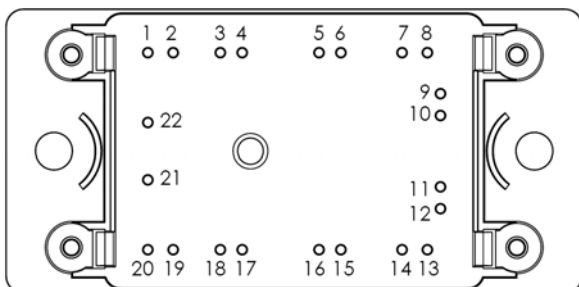


### Application

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

### Features

- Fieldstop IGBT
  - Low voltage drop
  - short tail current
  - Switching frequency up to 50 kHz
  - Soft recovery parallel diodes
  - Low diode VF
  - Low leakage current
  - RBSOA and SCSOA rated
- Very low stray inductance
- Internal thermistor for temperature monitoring
- High level of integration



### Benefits

- Outstanding performance at high frequency operation
- Direct mounting to heatsink (isolated package)
- Low junction to case thermal resistance
- Solderable terminals both for power and signal for easy PCB mounting
- Low profile
- RoHS Compliant

Pins 5/6/15/16 ; 3/4/17/18 ; 9/10 ; 11/12 must be shorted together

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

### Absolute maximum ratings (per IGBT)

Symbol	Parameter	Max ratings	Unit
$V_{CES}$	Collector - Emitter Breakdown Voltage	1200	V
$I_C$	Continuous Collector Current	$T_C = 25^\circ C$	40
		$T_C = 80^\circ C$	25
$I_{CM}$	Pulsed Collector Current	$T_C = 25^\circ C$	50
$V_{GE}$	Gate - Emitter Voltage	$\pm 20$	V
$P_D$	Maximum Power Dissipation	$T_C = 25^\circ C$	227
RBSOA	Reverse Bias Safe Operating Area	$T_j = 125^\circ C$	50A@1150V

**CAUTION:** These Devices are sensitive to Electrostatic Discharge. Proper Handling Procedures Should Be Followed. See application note APT0502 on [www.microsemi.com](http://www.microsemi.com)

**Electrical Characteristics** (per IGBT)

<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	$V_{GE} = 0V ; V_{CE} = 1200V$			250	$\mu A$
$V_{CE(sat)}$	Collector Emitter saturation Voltage	$V_{GE} = 15V$ $I_C = 25A$		2.1		V
$V_{GE(th)}$	Gate Threshold Voltage	$V_{GE} = V_{CE}, I_C = 1mA$	3	5.5	7	V
$I_{GES}$	Gate – Emitter Leakage Current	$V_{GE} = 20V, V_{CE} = 0V$			150	nA

**Dynamic Characteristics** (per IGBT)

<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	$V_{GE} = 0V$		2.02		nF
$C_{oes}$	Output Capacitance	$V_{CE} = 25V$		0.19		
$C_{res}$	Reverse Transfer Capacitance	$f = 1MHz$		0.06		
$Q_G$	Gate charge	$V_{GE} = -8/20V, I_C = 25A$ $V_{CE} = 600V$		280		nC
$T_{d(on)}$	Turn-on Delay Time	Inductive Switching (125°C) $V_{GE} = 15V$ $V_{Bus} = 600V$ $I_C = 25A$ $R_G = 16\Omega$		60		ns
$T_r$	Rise Time			50		
$T_{d(off)}$	Turn-off Delay Time			346		
$T_f$	Fall Time			40		
$E_{on}$	Turn-on Switching Energy	$V_{GE} = 15V$ $V_{Bus} = 600V$		1.35		mJ
$E_{off}$	Turn-off Switching Energy	$I_C = 25A$ $R_G = 16\Omega$		1.76		
$I_{sc}$	Short Circuit data	$V_{GE} \leq 15V ; V_{Bus} = 900V$ $t_p \leq 10\mu s ; T_j = 125^\circ C$		125		A
$R_{thJC}$	Junction to Case Thermal Resistance				0.55	$^\circ C/W$

**Reverse diode ratings and characteristics** (per diode)

Symbol	Characteristic	Test Conditions		Min	Typ	Max	Unit
V <sub>RRM</sub>	Maximum Peak Repetitive Reverse Voltage			1200			V
I <sub>RM</sub>	Maximum Reverse Leakage Current	V <sub>R</sub> =1200V				100	μA
I <sub>F</sub>	DC Forward Current		T <sub>c</sub> = 80°C		25		A
V <sub>F</sub>	Diode Forward Voltage	I <sub>F</sub> = 25A			2.6	3.1	V
		I <sub>F</sub> = 50A			3.2		
		I <sub>F</sub> = 25A	T <sub>j</sub> = 125°C		1.8		
t <sub>rr</sub>	Reverse Recovery Time	I <sub>F</sub> = 25A V <sub>R</sub> = 667V di/dt = 200A/μs	T <sub>j</sub> = 25°C		320		ns
			T <sub>j</sub> = 125°C		360		
Q <sub>rr</sub>	Reverse Recovery Charge	I <sub>F</sub> = 25A V <sub>R</sub> = 667V di/dt = 200A/μs	T <sub>j</sub> = 25°C		480		nC
			T <sub>j</sub> = 125°C		1800		
R <sub>thJC</sub>	Junction to Case Thermal Resistance					1.4	°C/W

**Temperature sensor NTC**

Symbol	Characteristic	Min	Typ	Max	Unit
R <sub>25</sub>	Resistance @ 25°C		22		kΩ
ΔR <sub>25</sub> /R <sub>25</sub>	Resistance tolerance			5	%
ΔB/B	Beta tolerance			3	
B <sub>25/100</sub>	T <sub>25</sub> = 298.16 K		3980		K

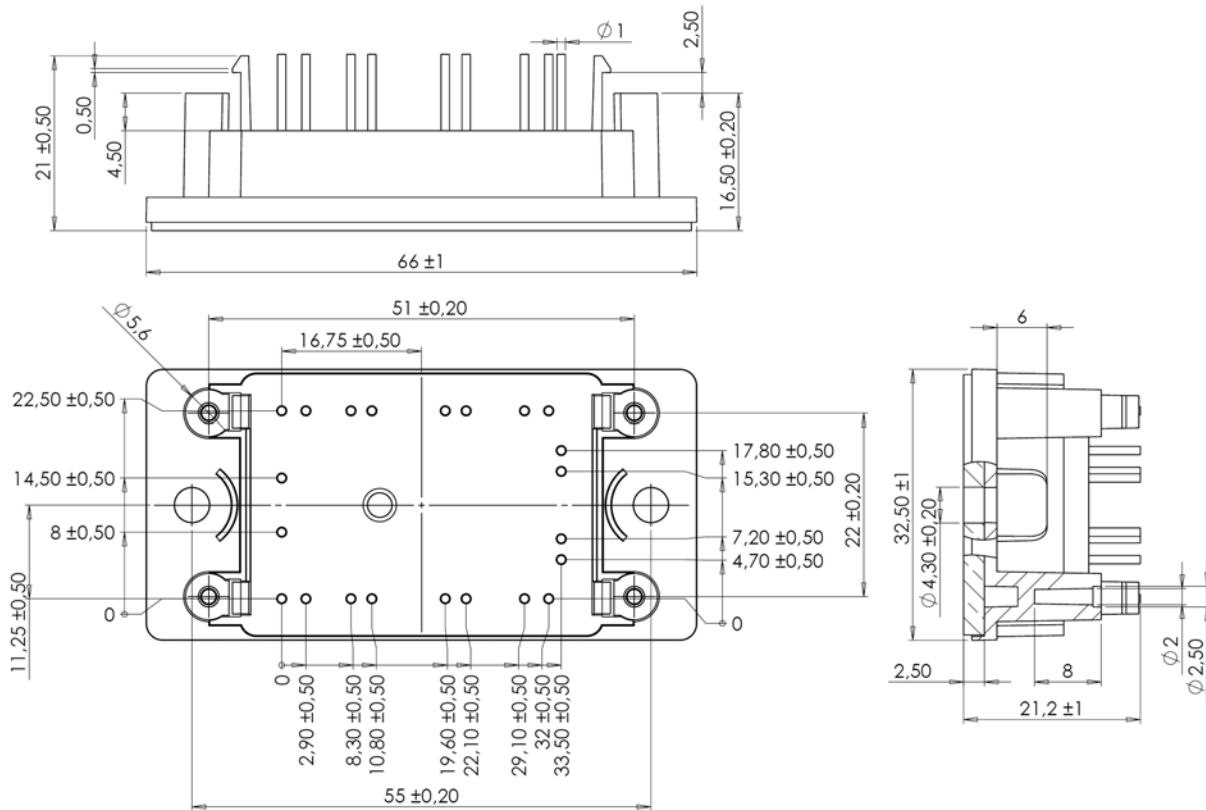
$$R_T = \frac{R_{25}}{\exp\left[B_{25/100}\left(\frac{1}{T_{25}} - \frac{1}{T}\right)\right]}$$

T: Thermistor temperature  
R<sub>T</sub>: Thermistor value at T

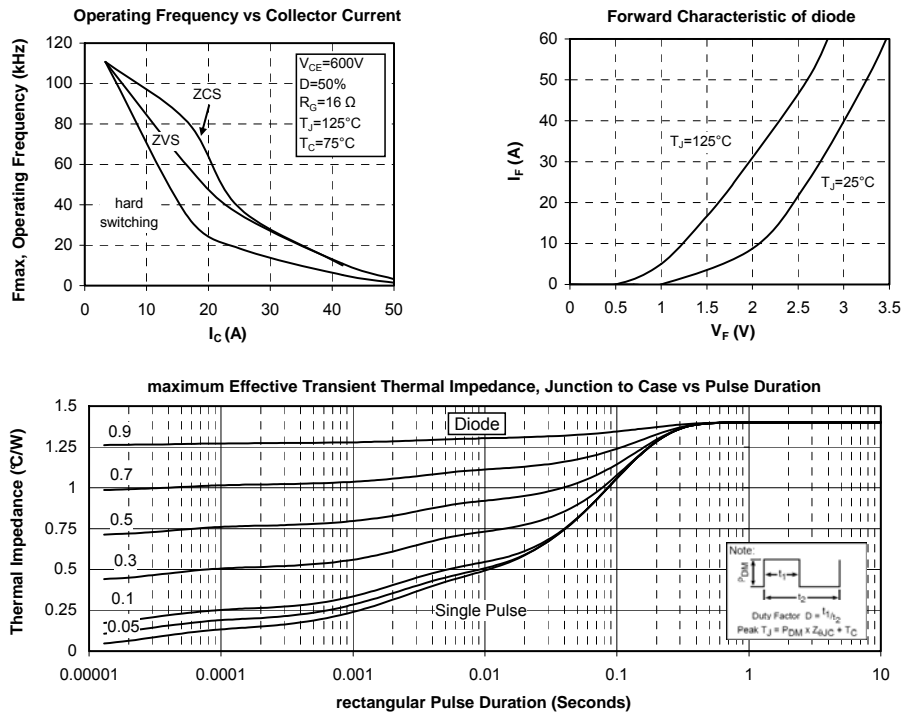
**Thermal and package characteristics**

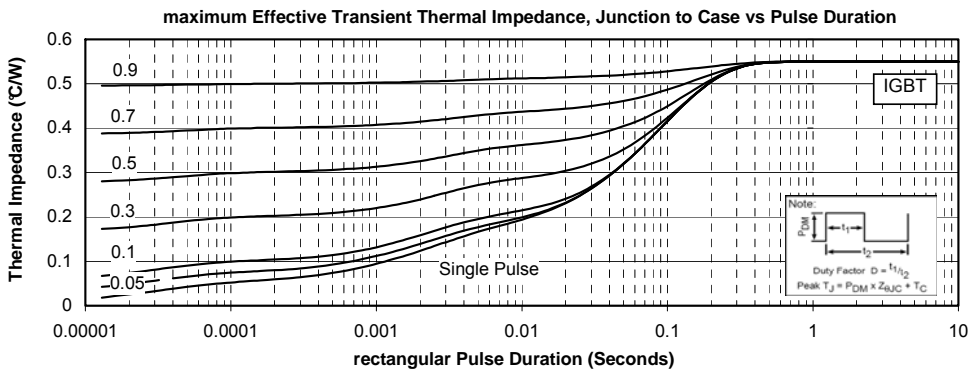
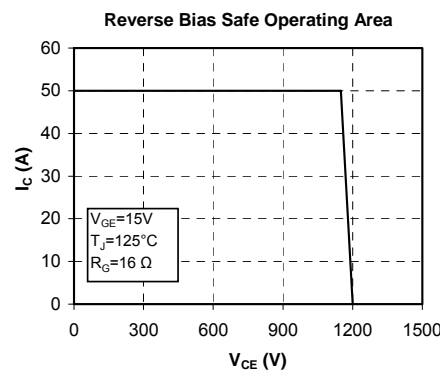
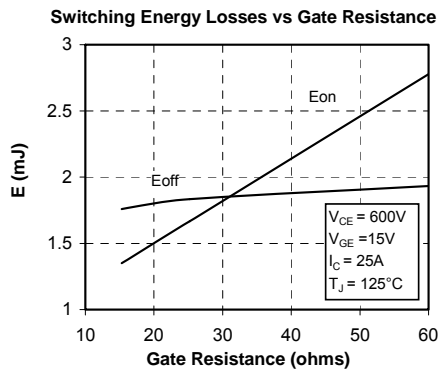
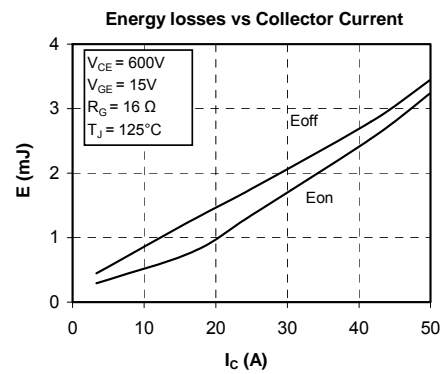
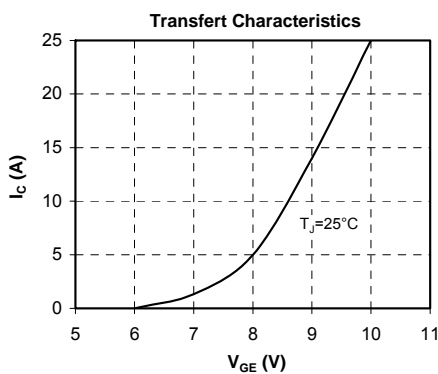
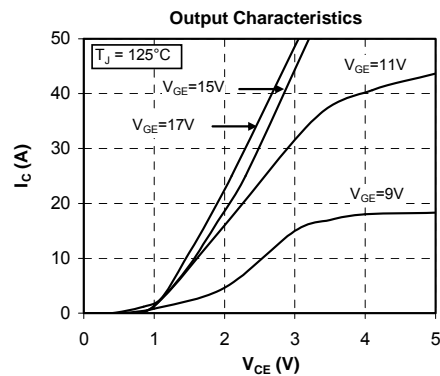
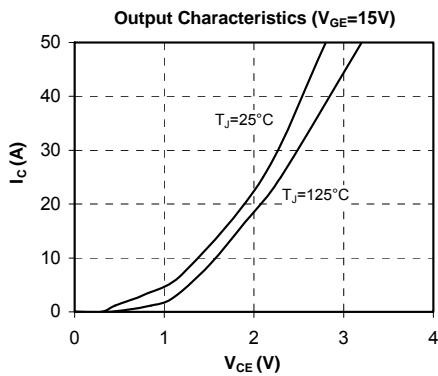
Symbol	Characteristic	Min	Typ	Max	Unit	
V <sub>ISOL</sub>	RMS Isolation Voltage, any terminal to case t = 1 min, I <sub>isol</sub> < 1mA, 50/60Hz	4000			V	
T <sub>J</sub>	Operating junction temperature range	-40		150	°C	
T <sub>STG</sub>	Storage Temperature Range	-40		125		
T <sub>C</sub>	Operating Case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

## Package outline (dimensions in mm)



## Typical Performance Curve





Microsemi reserves the right to change, without notice, the specifications and information contained herein