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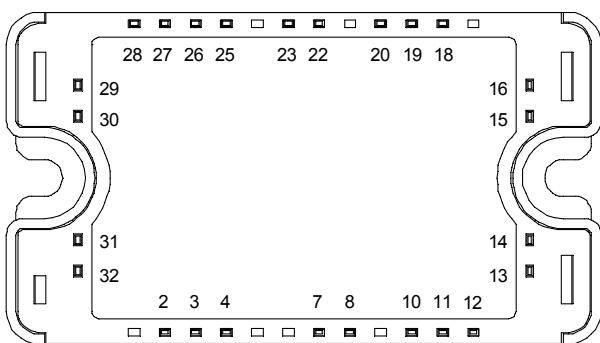
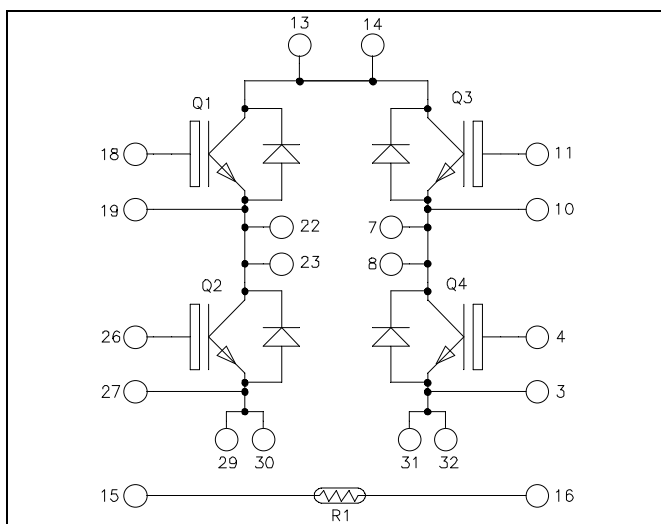
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Full - Bridge Fast Trench + Field Stop IGBT3 Power Module

$$V_{CES} = 1200V$$

$$I_C = 50A @ T_c = 80^{\circ}C$$



All multiple inputs and outputs must be shorted together
 Example: 13/14 ; 29/30 ; 22/23 ...

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
- Low stray inductance
- High level of integration
- Internal thermistor for temperature monitoring

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
- Easy paralleling due to positive T_C of V_{CEsat}
- Each leg can be easily paralleled to achieve a phase leg of twice the current capability
- RoHS Compliant

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	A
I_{CM}	Pulsed Collector Current	$T_C = 25^{\circ}C$ 100	A
V_{GE}	Gate - Emitter Voltage	± 20	V
P_D	Maximum Power Dissipation	$T_C = 25^{\circ}C$ 270	W
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

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

Electrical Characteristics

Symbol	Characteristic	Test Conditions		Min	Typ	Max	Unit
I_{CES}	Zero Gate Voltage Collector Current	$V_{GE} = 0V$ $V_{CE} = 1200V$	$T_j = 25^\circ\text{C}$ $T_j = 125^\circ\text{C}$			250 500	μA
$V_{CE(sat)}$	Collector Emitter saturation Voltage	$V_{GE} = 15V$ $I_C = 50A$	$T_j = 25^\circ\text{C}$ $T_j = 125^\circ\text{C}$	1.4	1.7 2.0	2.1	V
$V_{GE(th)}$	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

Symbol	Characteristic	Test Conditions		Min	Typ	Max	Unit
C_{ies}	Input Capacitance	$V_{GE} = 0V, V_{CE} = 25V$			3600		pF
C_{rss}	Reverse Transfer Capacitance	$f = 1MHz$			160		
$T_{d(on)}$	Turn-on Delay Time	Inductive Switching (25°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°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	$V_{GE} = \pm 15V$ $V_{Bus} = 600V$ $I_C = 50A$ $R_G = 18\Omega$	$T_j = 125^\circ\text{C}$		5		mJ
E_{off}	Turn-off Switching Energy		$T_j = 125^\circ\text{C}$		5.5		

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	$V_R = 1200V$	$T_j = 25^\circ\text{C}$ $T_j = 125^\circ\text{C}$			250 500	μA
I_F	DC Forward Current		$T_c = 70^\circ\text{C}$		60		A
V_F	Diode Forward Voltage	$I_F = 60A$ $I_F = 120A$ $I_F = 60A$	$T_j = 125^\circ\text{C}$		2 2.3 1.8	2.5	V
t_{rr}	Reverse Recovery Time	$I_F = 60A$ $V_R = 800V$ $di/dt = 200A/\mu s$	$T_j = 25^\circ\text{C}$ $T_j = 125^\circ\text{C}$		400 470		ns
Q_{rr}	Reverse Recovery Charge		$T_j = 25^\circ\text{C}$ $T_j = 125^\circ\text{C}$		1200 4000		
E_r	Reverse Recovery Energy	$I_F = 60A$ $V_R = 800V$ $di/dt = 1000A/\mu s$	$T_j = 125^\circ\text{C}$		2.2		mJ



<i>Symbol</i>	<i>Characteristic</i>	<i>Min</i>	<i>Typ</i>	<i>Max</i>	<i>Unit</i>
R ₂₅	Resistance @ 25°C		50		kΩ
B _{25/85}	T ₂₅ = 298.15 K		3952		K

$$R_T = \frac{R_{25}}{\exp \left[B_{25/85} \left(\frac{1}{T_{25}} - \frac{1}{T} \right) \right]}$$

<i>Symbol</i>	<i>Characteristic</i>			<i>Min</i>	<i>Typ</i>	<i>Max</i>	<i>Unit</i>
R _{thJC}	Junction to Case Thermal Resistance		IGBT			0.45	°C/W
			Diode			0.9	
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					110	g

Technical drawing of a rectangular plate with dimensions and tolerances. The drawing includes a top view, a side view, and a cross-section view.

Top View Dimensions:

- Overall width: $73,40 \pm 0,50$
- Overall height: $11,50 \pm 0,50$
- Radius of the top corners: $R4$
- Radius of the bottom corners: $R5$
- Radius of the bottom corners (inner): $R2,25$
- Distance from the bottom edge to the center of the bottom corners: $4,50 \pm 0,20$
- Distance from the left edge to the center of the left corners: $17,60 \pm 0,50$
- Distance from the right edge to the center of the right corners: $17,60 \pm 0,50$
- Distance from the top edge to the center of the top corners: $19 \pm 0,50$
- Distance from the bottom edge to the center of the bottom corners: $19 \pm 0,50$
- Distance from the left edge to the center of the left corners: $11,43 \pm 0,50$
- Distance from the right edge to the center of the right corners: $11,43 \pm 0,50$
- Distance from the top edge to the center of the top corners: $7,62 \pm 0,50$
- Distance from the bottom edge to the center of the bottom corners: $7,62 \pm 0,50$

Side View Dimensions:

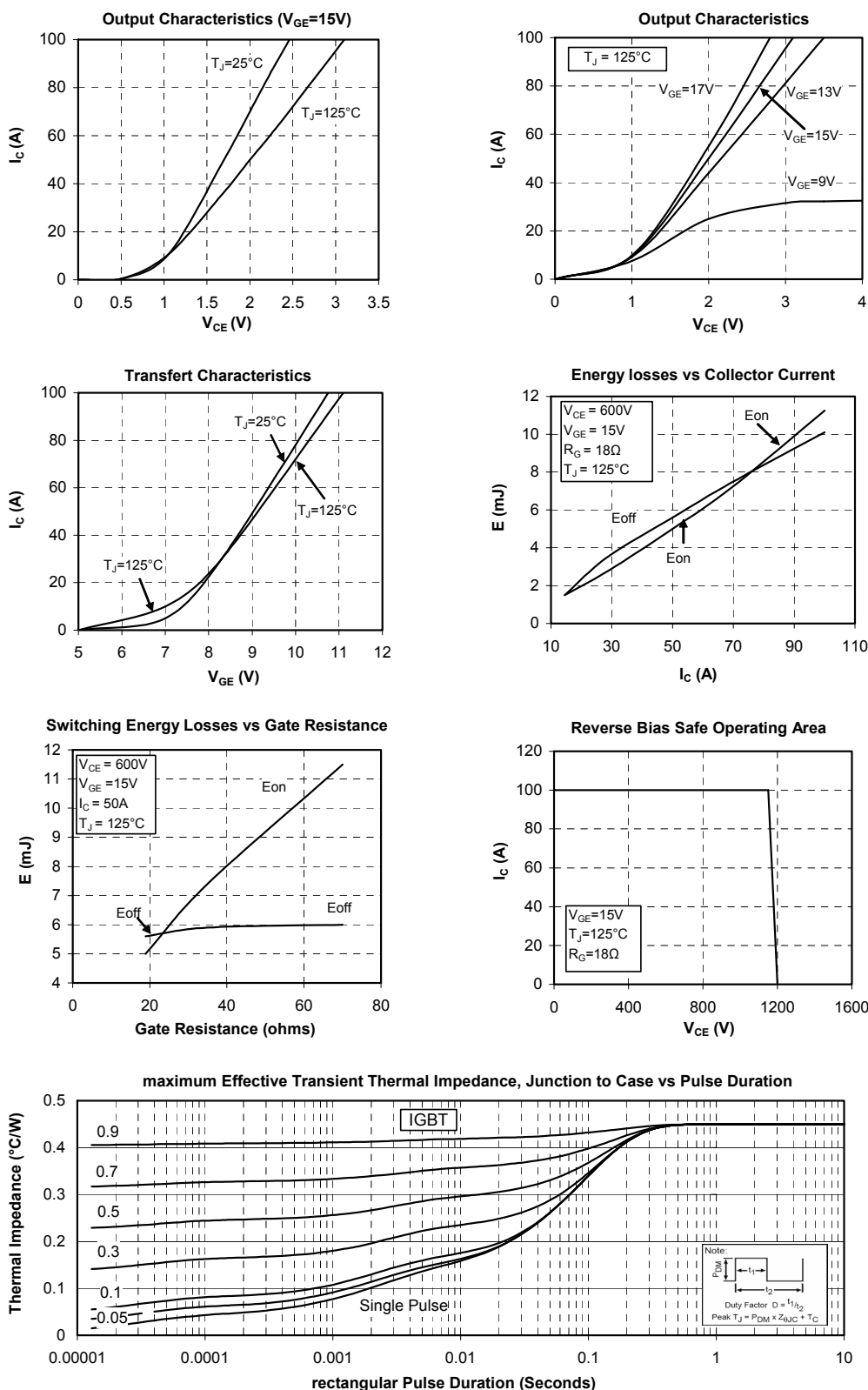
- Overall width: $73,40 \pm 0,50$
- Overall height: $11,50 \pm 0,50$
- Radius of the top corners: $R4$
- Radius of the bottom corners: $R5$
- Radius of the bottom corners (inner): $R2,25$
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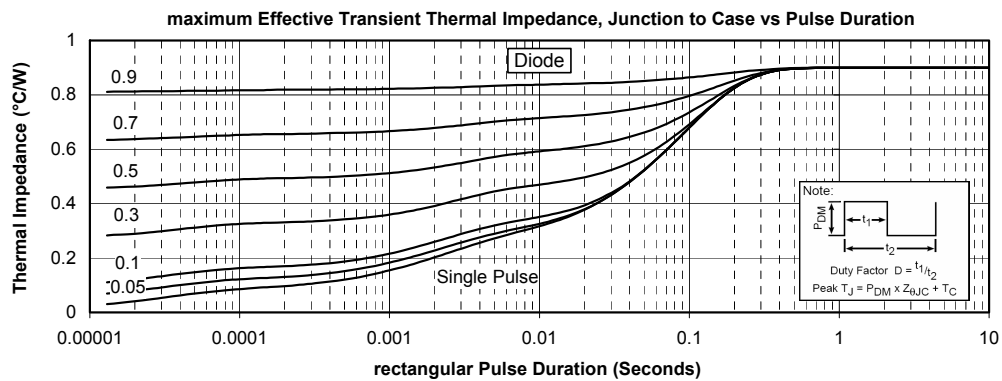
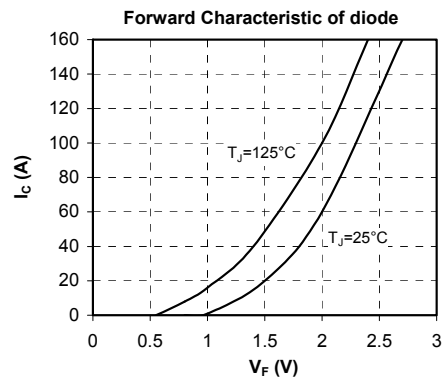
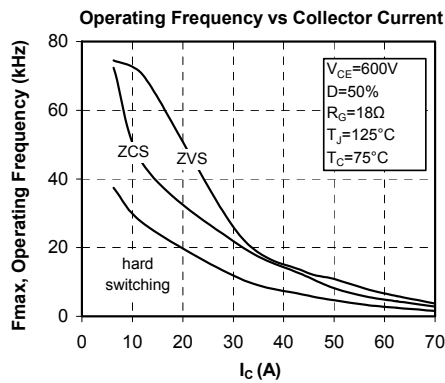
Cross-section View Dimensions:

- Overall width: $73,40 \pm 0,50$
- Overall height: $11,50 \pm 0,50$
- Radius of the top corners: $R4$
- Radius of the bottom corners: $R5$
- Radius of the bottom corners (inner): $R2,25$
- Distance from the bottom edge to the center of the bottom corners: $4,50 \pm 0,20$
- Distance from the left edge to the center of the left corners: $17,60 \pm 0,50$
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Typical Performance Curve





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