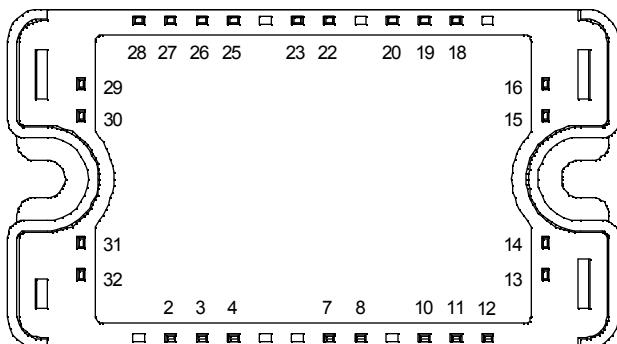
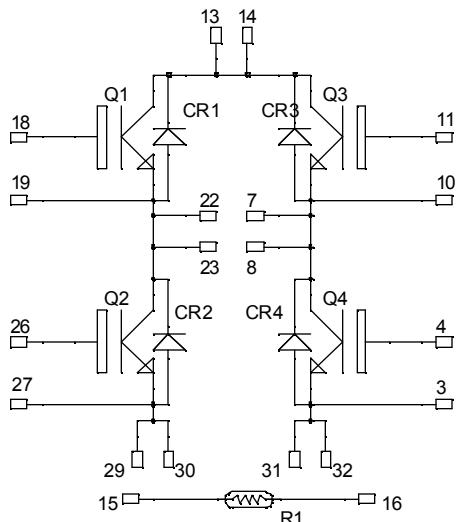


**Full - Bridge
Fast Trench + Field Stop IGBT®
Power Module**
**V_{CES} = 1200V
I_C = 35A @ T_c = 80°C**


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 IGBT® Technology
 - Low voltage drop
 - Low tail current
 - Switching frequency up to 20 kHz
 - Soft recovery parallel diodes
 - Low diode VF
 - Low leakage current
 - Avalanche energy rated
 - 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 TC of VCEsat
- 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°C	A
		T _c = 80°C	
I _{CM}	Pulsed Collector Current	T _c = 25°C	
V _{GE}	Gate – Emitter Voltage	±20	V
P _D	Maximum Power Dissipation	T _c = 25°C	W
RBSOA	Reverse Bias Safe Operating Area	T _j = 125°C	70A@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	$V_{GE} = 0\text{V}$ $V_{CE} = 1200\text{V}$	$T_j = 25^\circ\text{C}$			250	μA
			$T_j = 125^\circ\text{C}$			500	
$V_{CE(\text{sat})}$	Collector Emitter saturation Voltage	$V_{GE} = 15\text{V}$ $I_C = 35\text{A}$	$T_j = 25^\circ\text{C}$		1.7	2.1	V
			$T_j = 125^\circ\text{C}$		2.0		
$V_{GE(\text{th})}$	Gate Threshold Voltage	$V_{GE} = V_{CE}$, $I_C = 1.5\text{mA}$		5.0	5.8	6.5	V
I_{GES}	Gate – Emitter Leakage Current	$V_{GE} = 20\text{V}$, $V_{CE} = 0\text{V}$				400	nA

Dynamic Characteristics

Symbol	Characteristic	Test Conditions		Min	Typ	Max	Unit
C_{ies}	Input Capacitance	$V_{GE} = 0\text{V}$, $V_{CE} = 25\text{V}$ $f = 1\text{MHz}$		2.5			nF
C_{res}	Reverse Transfer Capacitance			0.15			
$T_{d(on)}$	Turn-on Delay Time	$V_{GE} = \pm 15\text{V}$ $V_{Bus} = 600\text{V}$ $I_C = 35\text{A}$ $R_G = 27\Omega$	Inductive Switching (25°C)	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	$V_{GE} = \pm 15\text{V}$ $V_{Bus} = 600\text{V}$ $I_C = 35\text{A}$ $R_G = 27\Omega$	Inductive Switching (125°C)	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	$V_{GE} = \pm 15\text{V}$ $V_{Bus} = 600\text{V}$ $I_C = 35\text{A}$ $R_G = 27\Omega$	$T_j = 125^\circ\text{C}$	3.5			mJ
E_{off}	Turn-off Switching Energy			4.1			

Reverse diode ratings and characteristics

Symbol	Characteristic	Test Conditions		Min	Typ	Max	Unit	
V_{RRM}	Maximum Peak Repetitive Reverse Voltage	$V_R = 1200\text{V}$		1200			V	
I_{RM}	Maximum Reverse Leakage Current		$T_j = 25^\circ\text{C}$			250	μA	
I_F	DC Forward Current		$T_c = 70^\circ\text{C}$		30		A	
V_F	Diode Forward Voltage	$I_F = 30\text{A}$			2.0	2.5	V	
		$I_F = 60\text{A}$			2.3			
		$I_F = 30\text{A}$	$T_j = 125^\circ\text{C}$		1.8			
t_{rr}	Reverse Recovery Time	$I_F = 30\text{A}$ $V_R = 800\text{V}$ $di/dt = 200\text{A}/\mu\text{s}$	$T_j = 25^\circ\text{C}$		370		ns	
			$T_j = 125^\circ\text{C}$		500			
Q_{rr}	Reverse Recovery Charge		$T_j = 25^\circ\text{C}$		660		nC	
			$T_j = 125^\circ\text{C}$		3450			
E_r	Reverse Recovery Energy	$I_F = 30\text{A}$ $V_R = 800\text{V}$ $di/dt = 1000\text{A}/\mu\text{s}$	$T_j = 125^\circ\text{C}$		1.6		mJ	

Temperature sensor NTC (see application note APT0406 on www.microsemi.com for more information).

Symbol **Characteristic**
Min **Typ** **Max** **Unit**

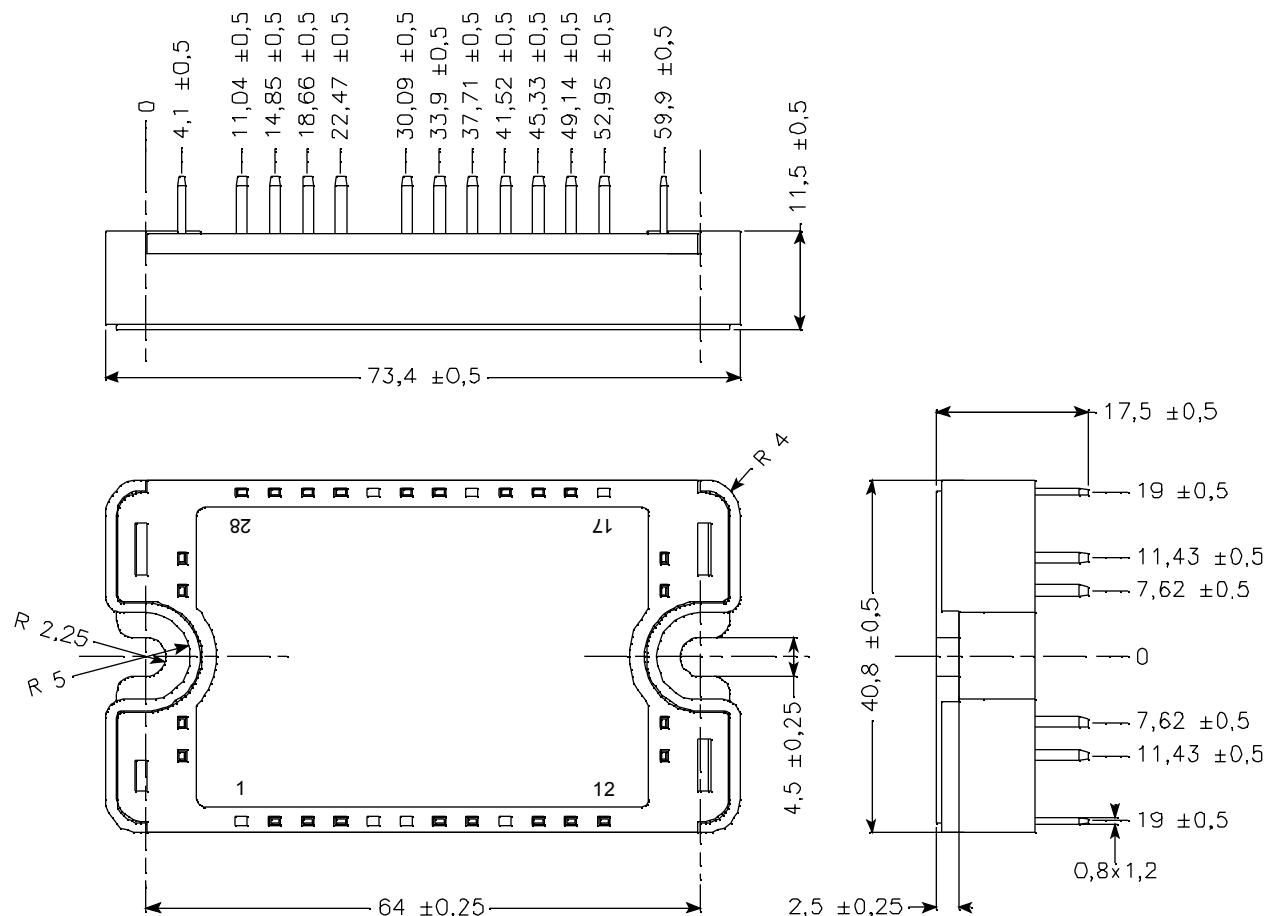
R ₂₅	Resistance @ 25°C		50		kΩ
B _{25/85}	T ₂₅ = 298.15 K		3952		K

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

T: Thermistor temperature
R_T: Thermistor value at T

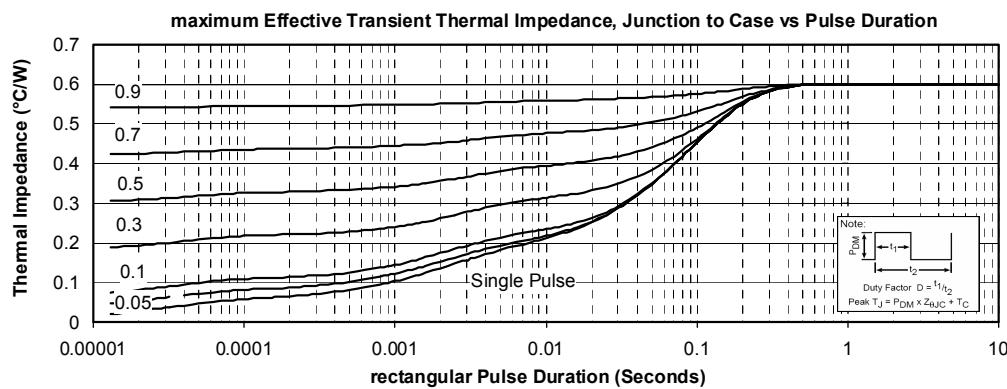
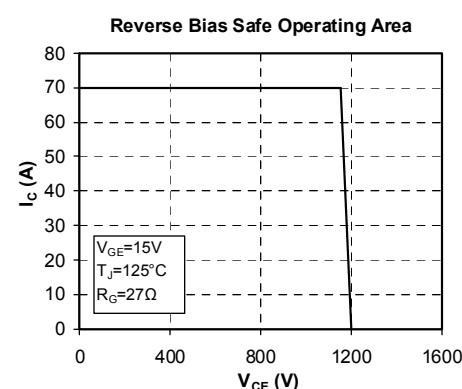
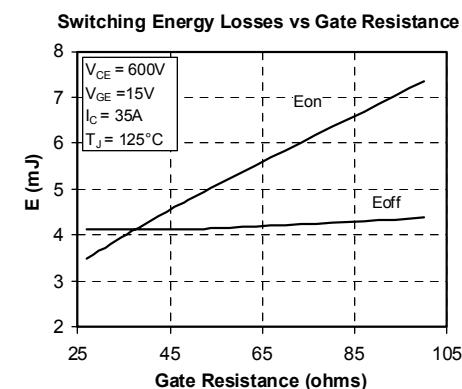
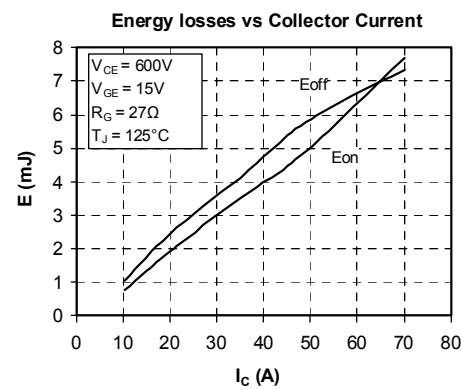
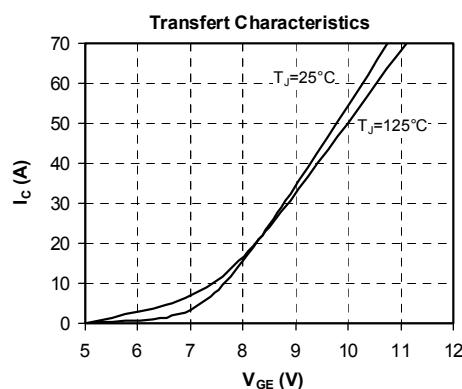
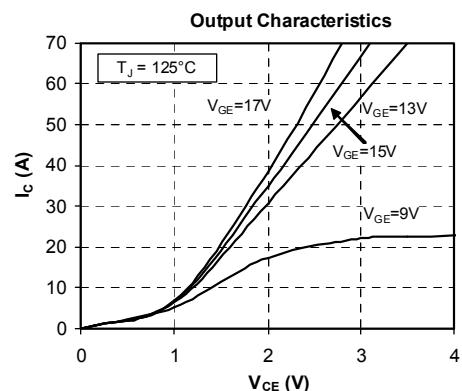
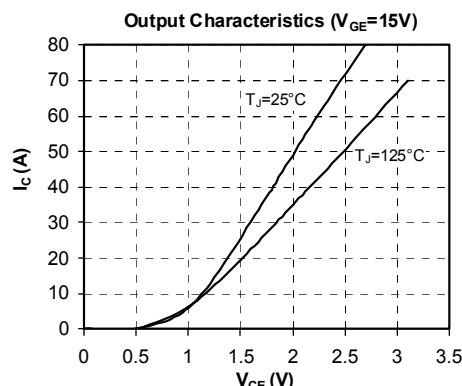
Thermal and package characteristics
Symbol **Characteristic**
Min **Typ** **Max** **Unit**

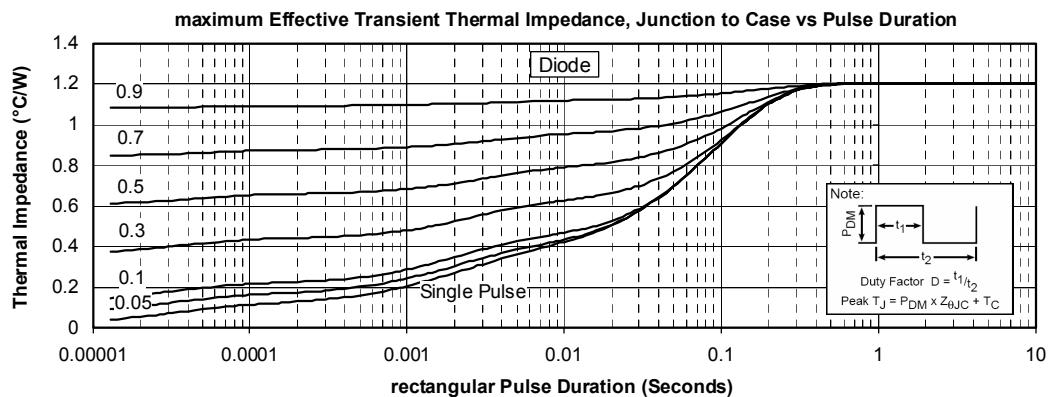
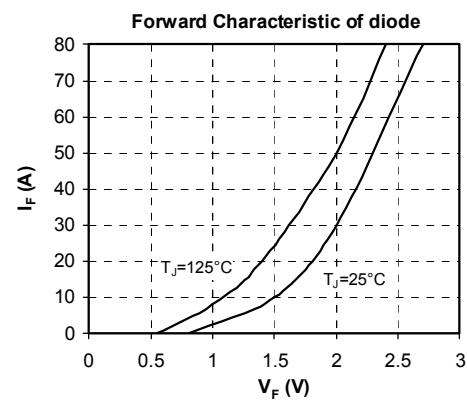
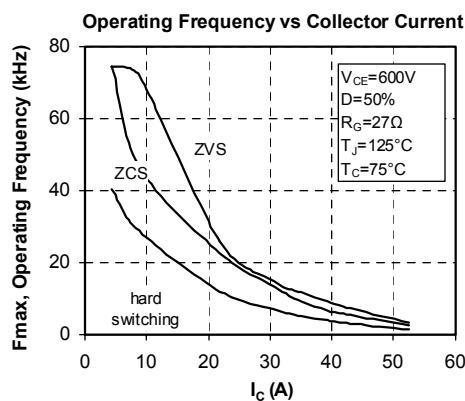
R _{thJC}	Junction to Case Thermal Resistance	IGBT		0.6	°C/W	
		Diode		1.2		
V _{ISOL}	RMS Isolation Voltage, any terminal to case t = 1 min, I isol < 1mA, 50/60Hz	2500			V	
T _J	Operating junction temperature range	-40		150		
T _{STG}	Storage Temperature Range	-40		125	°C	
T _C	Operating Case Temperature	-40		100		
Torque	Mounting torque	To heatsink	M4	2.5	4.7	N.m
Wt	Package Weight			110	g	

SP3 Package outline (dimensions in mm)

 See application note 1901 - Mounting Instructions for SP3 Power Modules on www.microsemi.com



Typical Performance Curve





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

Microsemi's products are covered by one or more of U.S. patents 4,895,810 5,045,903 5,089,434 5,182,234 5,019,522 5,262,336 6,503,786 5,256,583 4,748,103 5,283,202 5,231,474 5,434,095 5,528,058 and foreign patents. U.S. and Foreign patents pending. All Rights Reserved.



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- Подбор аналогов;
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- Поставка образцов и прототипов;
- Техническая поддержка проекта;
- Защита от снятия компонента с производства.



Как с нами связаться

Телефон: 8 (812) 309 58 32 (многоканальный)

Факс: 8 (812) 320-02-42

Электронная почта: org@eplast1.ru

Адрес: 198099, г. Санкт-Петербург, ул. Калинина, дом 2, корпус 4, литера А.