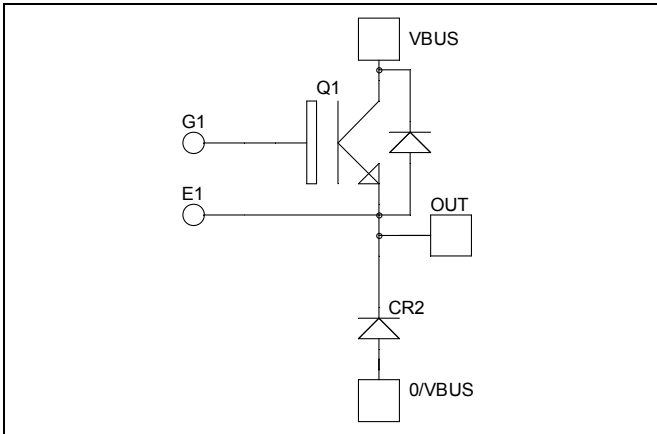


***Buck chopper  
Trench + Field Stop IGBT3  
Power Module***

**$V_{CES} = 1700V$   
 $I_C = 150A @ T_c = 80^\circ C$**

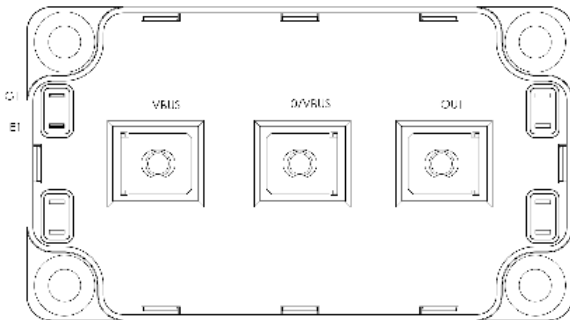


### Application

- AC and DC motor control
- Switched Mode Power Supplies

### Features

- 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
  - Symmetrical design
  - M5 power connectors
- High level of integration



### Benefits

- Stable temperature behavior
- Very rugged
- Direct mounting to heatsink (isolated package)
- Low junction to case thermal resistance
- Easy paralleling due to positive TC of VCEsat
- Low profile
- RoHS Compliant

### Absolute maximum ratings

Symbol	Parameter	Max ratings	Unit
$V_{CES}$	Collector - Emitter Breakdown Voltage	1700	V
$I_C$	Continuous Collector Current	$T_c = 25^\circ C$	250
		$T_c = 80^\circ C$	150
$I_{CM}$	Pulsed Collector Current	$T_c = 25^\circ C$	300
$V_{GE}$	Gate - Emitter Voltage	$\pm 20$	V
$P_D$	Maximum Power Dissipation	$T_c = 25^\circ C$	890
RBSOA	Reverse Bias Safe Operating Area	$T_j = 125^\circ C$	300A @ 1600V

**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)

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	$V_{GE} = 0V, V_{CE} = 1700V$			350	$\mu\text{A}$
$V_{CE(sat)}$	Collector Emitter Saturation Voltage	$V_{GE} = 15V$ $I_C = 150A$		2.0	2.4	V
$V_{GE(th)}$	Gate Threshold Voltage	$V_{GE} = V_{CE}, I_C = 3mA$	5.0	5.8	6.5	V
$I_{GES}$	Gate – Emitter Leakage Current	$V_{GE} = 20V, V_{CE} = 0V$			600	nA

**Dynamic Characteristics**

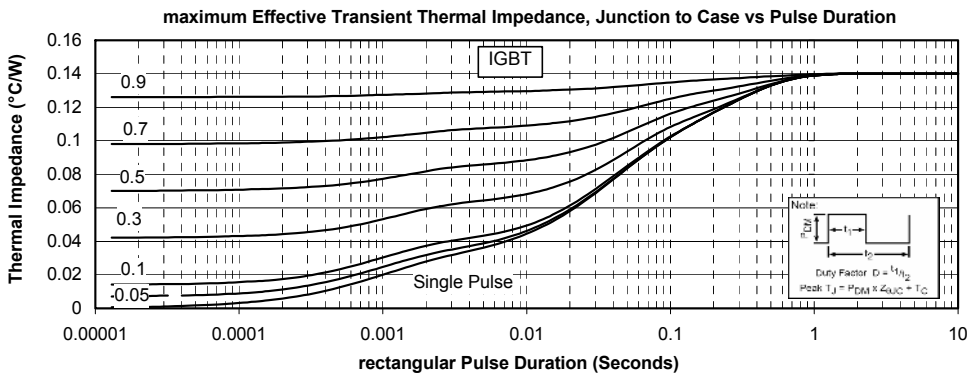
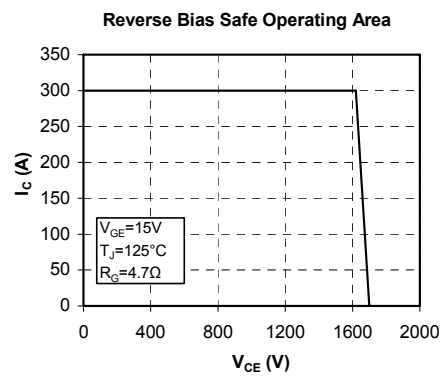
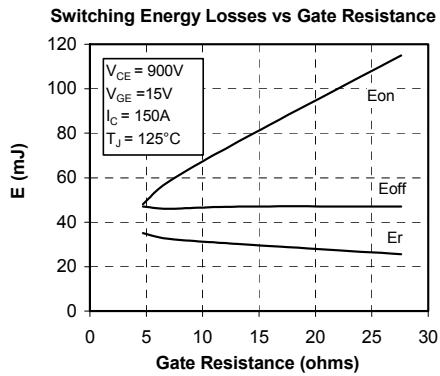
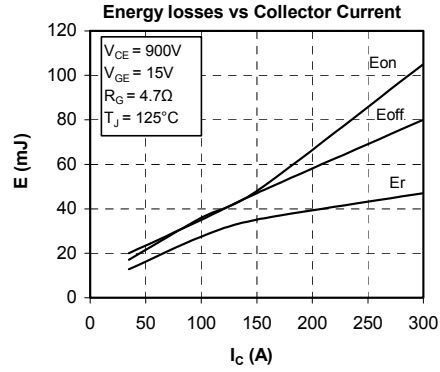
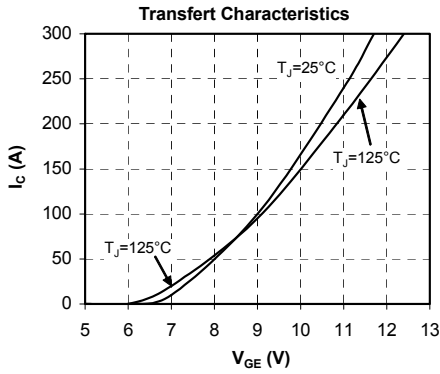
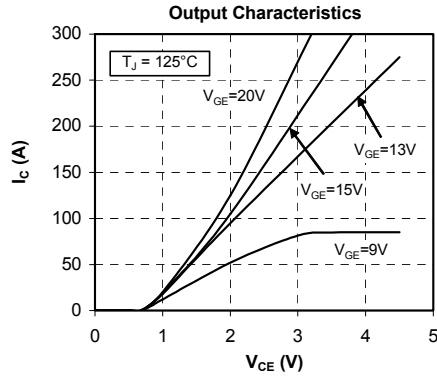
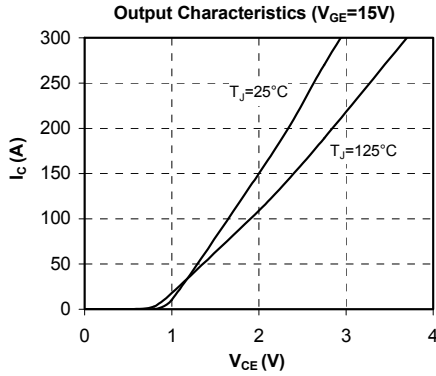
Symbol	Characteristic	Test Conditions	Min	Typ	Max	Unit
$C_{ies}$	Input Capacitance	$V_{GE} = 0V$		13.5		nF
$C_{oes}$	Output Capacitance	$V_{CE} = 25V$		0.55		
$C_{res}$	Reverse Transfer Capacitance	$f = 1MHz$		0.44		
$T_{d(on)}$	Turn-on Delay Time	Inductive Switching ( $25^\circ\text{C}$ )		370		ns
$T_r$	Rise Time	$V_{GE} = 15V$ $V_{Bus} = 900V$		40		
$T_{d(off)}$	Turn-off Delay Time	$I_C = 150A$		650		
$T_f$	Fall Time	$R_G = 4.7\Omega$		180		
$T_{d(on)}$	Turn-on Delay Time	Inductive Switching ( $125^\circ\text{C}$ )		400		ns
$T_r$	Rise Time	$V_{GE} = 15V$ $V_{Bus} = 900V$		50		
$T_{d(off)}$	Turn-off Delay Time	$I_C = 150A$		800		
$T_f$	Fall Time	$R_G = 4.7\Omega$		300		
$E_{on}$	Turn-on Switching Energy	$V_{GE} = 15V$ $V_{Bus} = 900V$		48		mJ
$E_{off}$	Turn-off Switching Energy	$I_C = 150A$ $R_G = 4.7\Omega$		47		

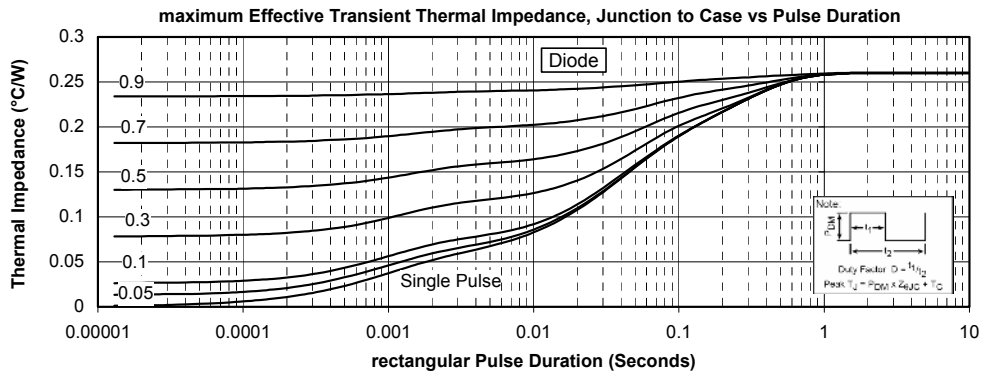
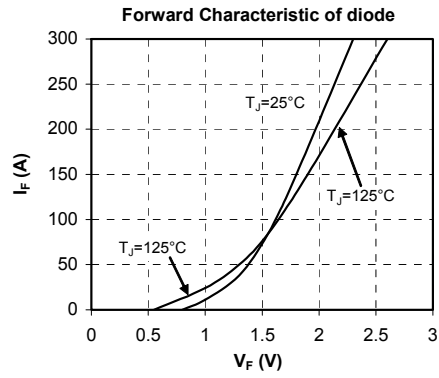
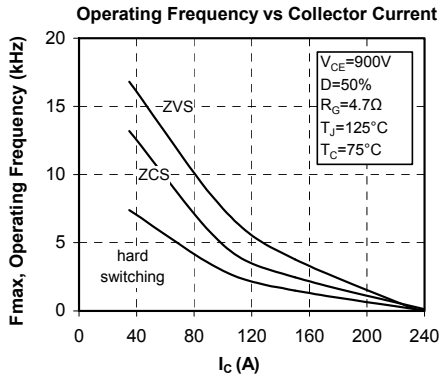
**Chopper diode ratings and characteristics**

Symbol	Characteristic	Test Conditions	Min	Typ	Max	Unit
$V_{RRM}$	Maximum Peak Repetitive Reverse Voltage		1700			V
$I_{RM}$	Maximum Reverse Leakage Current	$V_R = 1700V$			350	$\mu\text{A}$
					600	
$I_F$	DC Forward Current			150		A
$V_F$	Diode Forward Voltage	$I_F = 150A$		1.8	2.2	V
				1.9		
$t_{rr}$	Reverse Recovery Time			385		ns
				490		
$Q_{rr}$	Reverse Recovery Charge	$I_F = 150A$ $V_R = 900V$ $di/dt = 1600A/\mu\text{s}$		38		$\mu\text{C}$
				62		
$E_r$	Reverse Recovery Energy			17.5		mJ
				35		



## Typical Performance Curve





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