



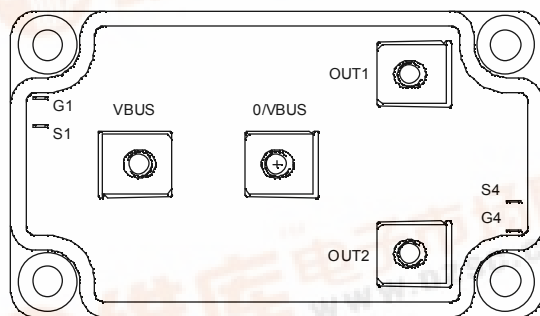
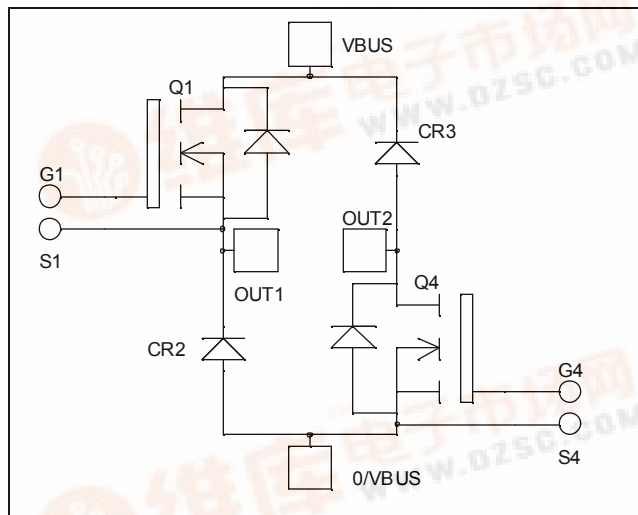
APT0502DHM10G

Asymmetrical - bridge MOSFET Power Module

$$V_{DSS} = 200V$$

$$R_{DS(on)} = 10m\Omega \text{ typ @ } T_j = 25^\circ C$$

$$I_D = 175A \text{ @ } T_c = 25^\circ C$$



Application

- Welding converters
- Switched Mode Power Supplies
- Switched Reluctance Motor Drives

Features

- Power MOS 7[®] MOSFETs
 - Low $R_{DS(on)}$
 - Low input and Miller capacitance
 - Low gate charge
 - Avalanche energy rated
 - Very rugged
- Kelvin source for easy drive
- Very low stray inductance
 - Symmetrical design
 - M5 power connectors
- High level of integration

Benefits

- Outstanding performance at high frequency operation
- Direct mounting to heatsink (isolated package)
- Low junction to case thermal resistance
- Low profile
- RoHS Compliant

Absolute maximum ratings

Symbol	Parameter	Max ratings	Unit
V_{DSS}	Drain - Source Breakdown Voltage	200	V
I_D	Continuous Drain Current	$T_c = 25^\circ C$	175
		$T_c = 80^\circ C$	131
I_{DM}	Pulsed Drain current	700	A
V_{GS}	Gate - Source Voltage	± 30	V
$R_{DS(on)}$	Drain - Source ON Resistance	12	m Ω
P_D	Maximum Power Dissipation	$T_c = 25^\circ C$	694
I_{AR}	Avalanche current (repetitive and non repetitive)	89	A
E_{AR}	Repetitive Avalanche Energy	50	mJ
E_{AS}	Single Pulse Avalanche Energy	2500	



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_{DSS}	Zero Gate Voltage Drain Current	$V_{GS} = 0V, V_{DS} = 200V$ $T_j = 25^{\circ}\text{C}$			200	μA
		$V_{GS} = 0V, V_{DS} = 160V$ $T_j = 125^{\circ}\text{C}$			1000	
$R_{DS(on)}$	Drain – Source on Resistance	$V_{GS} = 10V, I_D = 87.5A$		10	12	$\text{m}\Omega$
$V_{GS(th)}$	Gate Threshold Voltage	$V_{GS} = V_{DS}, I_D = 5\text{mA}$	3		5	V
I_{GSS}	Gate – Source Leakage Current	$V_{GS} = \pm 30V, V_{DS} = 0V$			± 150	nA

Dynamic Characteristics

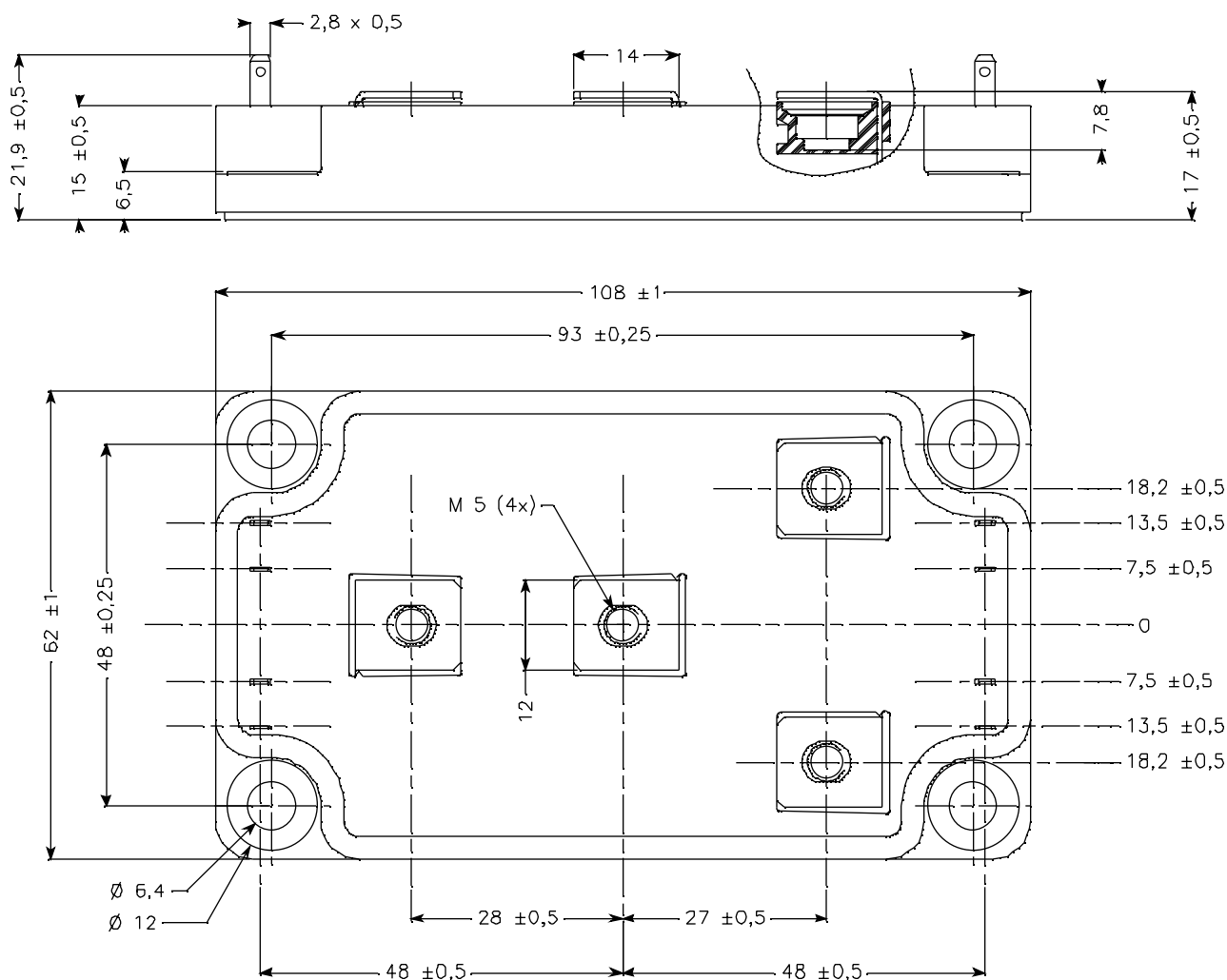
Symbol	Characteristic	Test Conditions	Min	Typ	Max	Unit
C_{iss}	Input Capacitance	$V_{GS} = 0V$ $V_{DS} = 25V$ $f = 1\text{MHz}$		13.7		nF
C_{oss}	Output Capacitance			4.36		
C_{rss}	Reverse Transfer Capacitance			0.19		
Q_g	Total gate Charge	$V_{GS} = 10V$ $V_{Bus} = 100V$ $I_D = 150A$		224		nC
Q_{gs}	Gate – Source Charge			86		
Q_{gd}	Gate – Drain Charge			94		
$T_{d(on)}$	Turn-on Delay Time	Inductive switching @ 125°C $V_{GS} = 15V$ $V_{Bus} = 133V$ $I_D = 150A$ $R_G = 2.5\Omega$		28		ns
T_r	Rise Time			56		
$T_{d(off)}$	Turn-off Delay Time			81		
T_f	Fall Time			99		
E_{on}	Turn-on Switching Energy	Inductive switching @ 25°C $V_{GS} = 15V, V_{Bus} = 133V$ $I_D = 150A, R_G = 2.5\Omega$		926		μJ
E_{off}	Turn-off Switching Energy			910		
E_{on}	Turn-on Switching Energy	Inductive switching @ 125°C $V_{GS} = 15V, V_{Bus} = 133V$ $I_D = 150A, R_G = 2.5\Omega$		1216		μJ
E_{off}	Turn-off Switching Energy			1062		

Diode ratings and characteristics

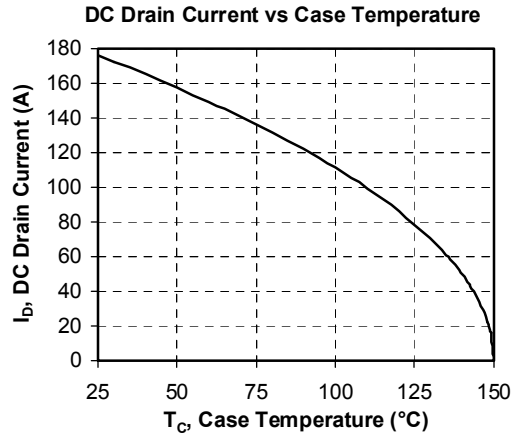
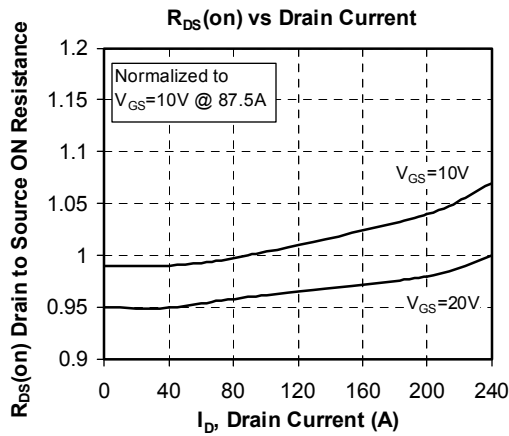
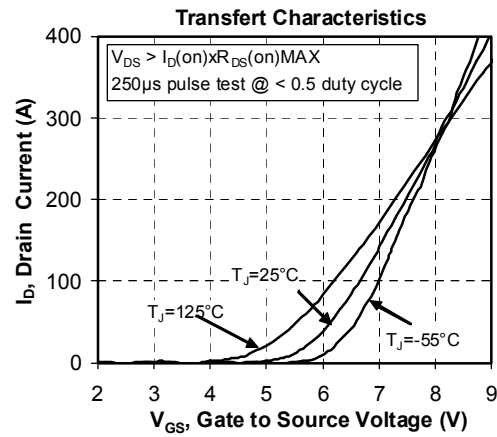
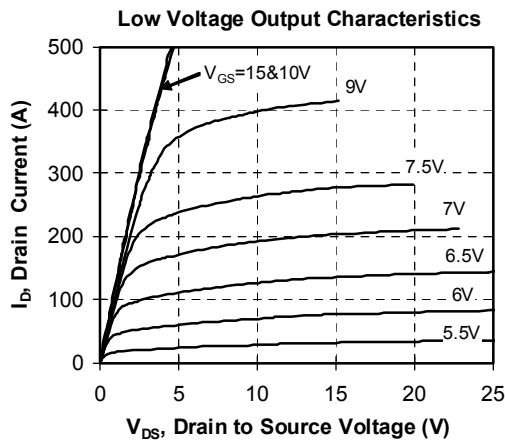
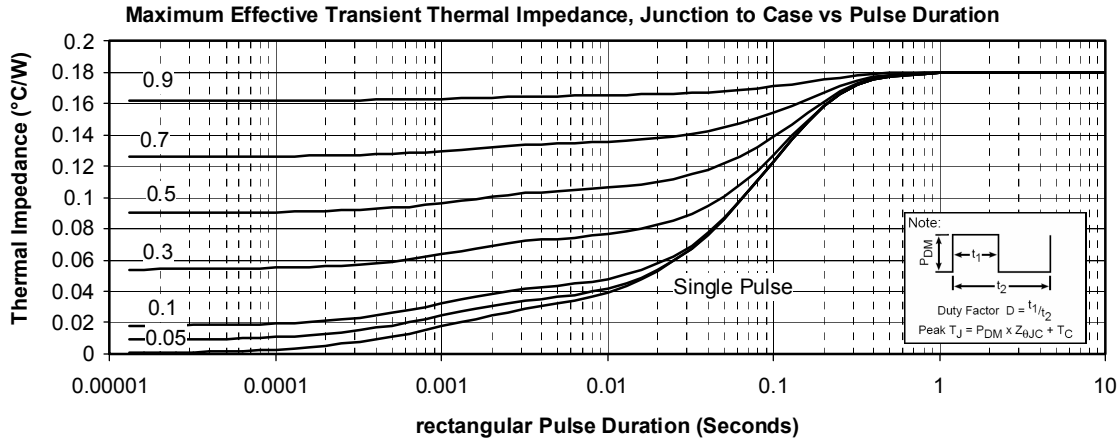
Symbol	Characteristic	Test Conditions	Min	Typ	Max	Unit
V_{RRM}	Maximum Peak Repetitive Reverse Voltage		200			V
I_{RM}	Maximum Reverse Leakage Current	$V_R = 200V$	$T_j = 25^{\circ}\text{C}$		250	μA
			$T_j = 125^{\circ}\text{C}$		600	
I_F	DC Forward Current	$T_c = 80^{\circ}\text{C}$		200		A
V_F	Diode Forward Voltage	$I_F = 200A$		1		V
		$I_F = 400A$		1.4		
		$I_F = 200A$ $T_j = 125^{\circ}\text{C}$		0.9		
t_{rr}	Reverse Recovery Time	$I_F = 200A$ $V_R = 133V$ $di/dt = 400A/\mu\text{s}$	$T_j = 25^{\circ}\text{C}$	60		ns
			$T_j = 125^{\circ}\text{C}$	110		
Q_{rr}	Reverse Recovery Charge	$T_j = 25^{\circ}\text{C}$		400		nC
			$T_j = 125^{\circ}\text{C}$	1680		

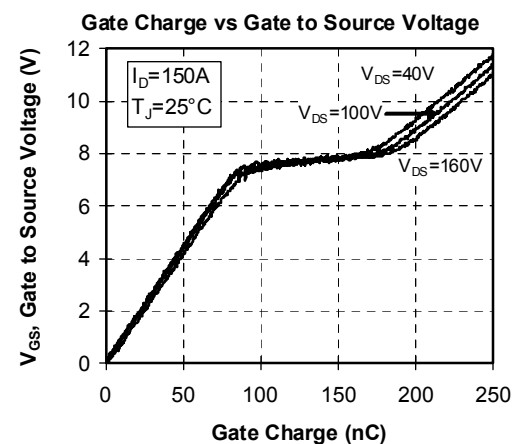
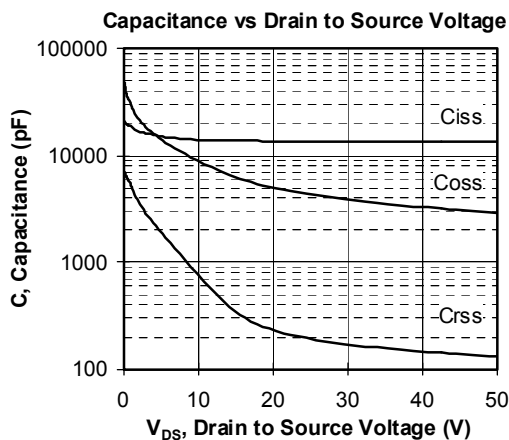
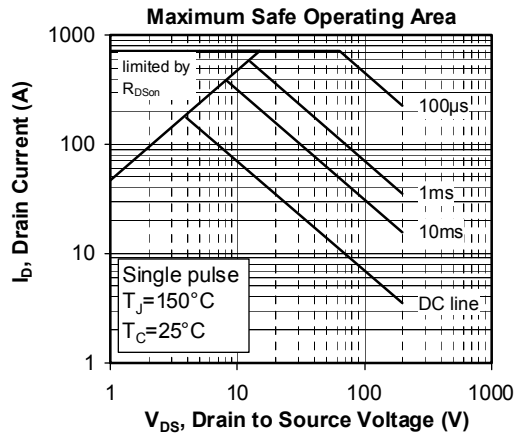
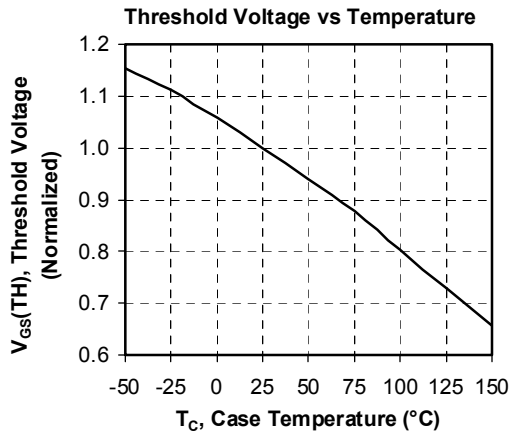
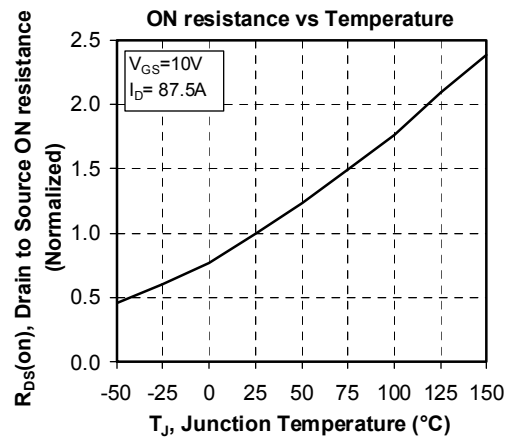
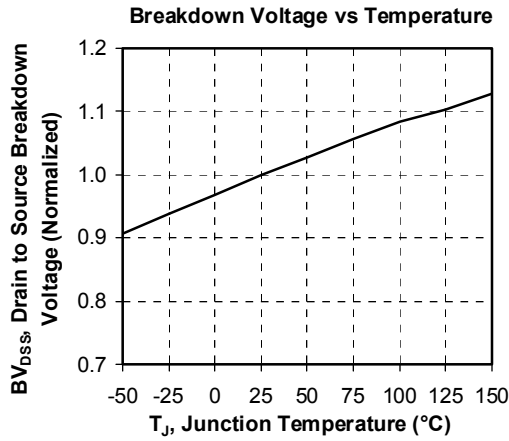


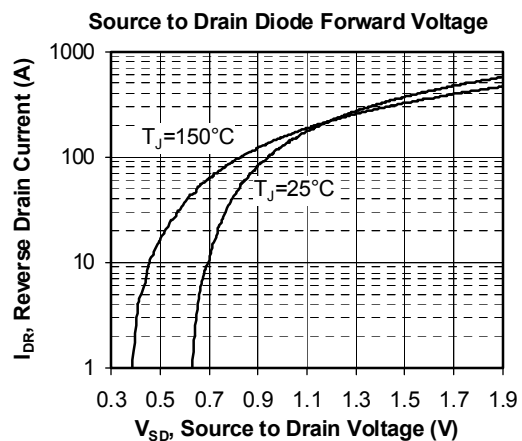
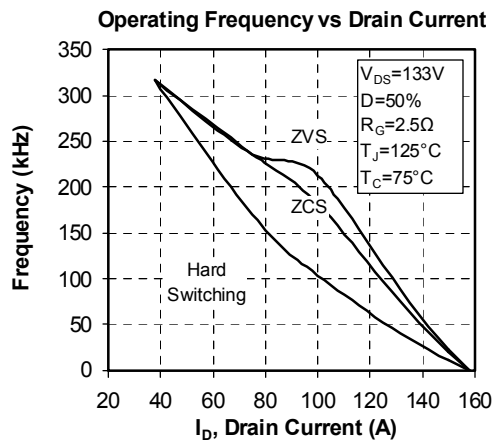
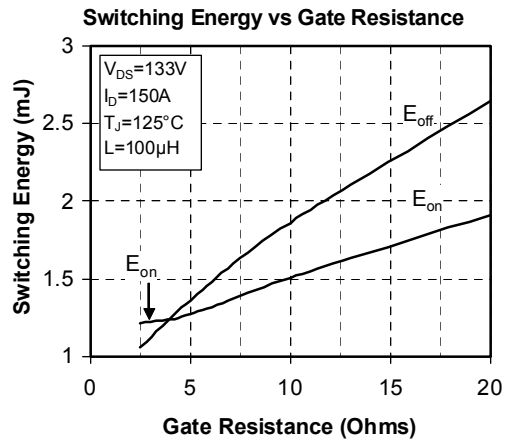
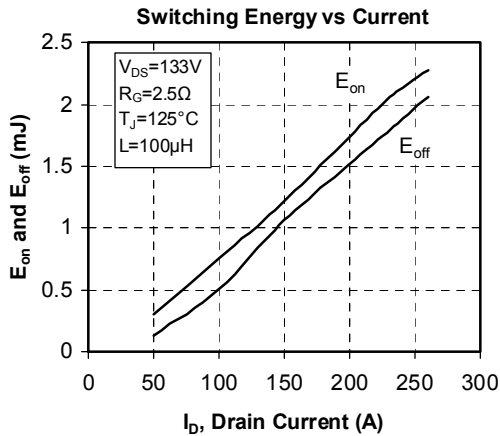
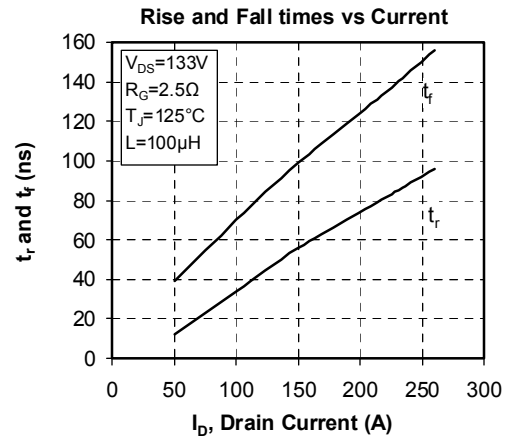
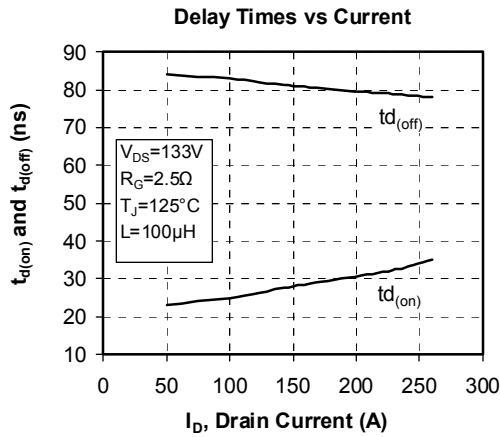
Symbol	Characteristic		Min	Typ	Max	Unit
R _{thJC}	Junction to Case Thermal Resistance	Transistor			0.18	°C/W
		Diode			0.29	
V _{ISOL}	RMS Isolation Voltage, any terminal to case t = 1 min, I isol < 1mA, 50/60Hz		2500			V
T _J	Operating junction temperature range		-40		150	°C
T _{STG}	Storage Temperature Range		-40		125	
T _C	Operating Case Temperature		-40		100	
Torque	Mounting torque	To heatsink	M6	3	5	N.m
		For terminals	M5	2	3.5	
Wt	Package Weight				280	g



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