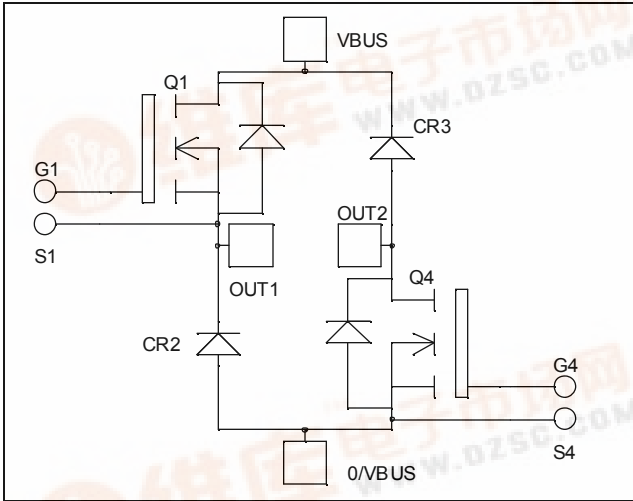




APT50DHM35G

Asymmetrical - bridge MOSFET Power Module

$V_{DSS} = 500V$
 $R_{DSon} = 35m\Omega \text{ typ @ } T_j = 25^\circ C$
 $I_D = 99A \text{ @ } T_c = 25^\circ C$



Application

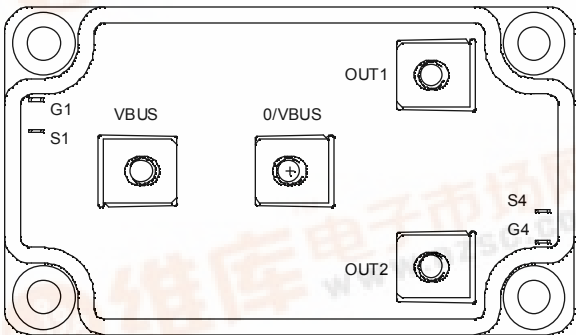
- Welding converters
- Switched Mode Power Supplies
- Switched Reluctance Motor Drives

Features

- Power MOS 7[®] MOSFETs
 - Low R_{DSon}
 - 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	500	V
I_D	Continuous Drain Current	$T_c = 25^\circ C$	99
		$T_c = 80^\circ C$	74
I_{DM}	Pulsed Drain current	396	
V_{GS}	Gate - Source Voltage	± 30	V
R_{DSon}	Drain - Source ON Resistance	39	$m\Omega$
P_D	Maximum Power Dissipation	$T_c = 25^\circ C$	781
I_{AR}	Avalanche current (repetitive and non repetitive)	51	A
E_{AR}	Repetitive Avalanche Energy	50	mJ
E_{AS}	Single Pulse Avalanche Energy	3000	

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	$V_{GS} = 0V, V_{DS} = 500V$	$T_j = 25^\circ\text{C}$			200	μA
		$V_{GS} = 0V, V_{DS} = 400V$	$T_j = 125^\circ\text{C}$			1000	
$R_{DS(on)}$	Drain – Source on Resistance	$V_{GS} = 10V, I_D = 49.5A$			35	39	$\text{m}\Omega$
$V_{GS(th)}$	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

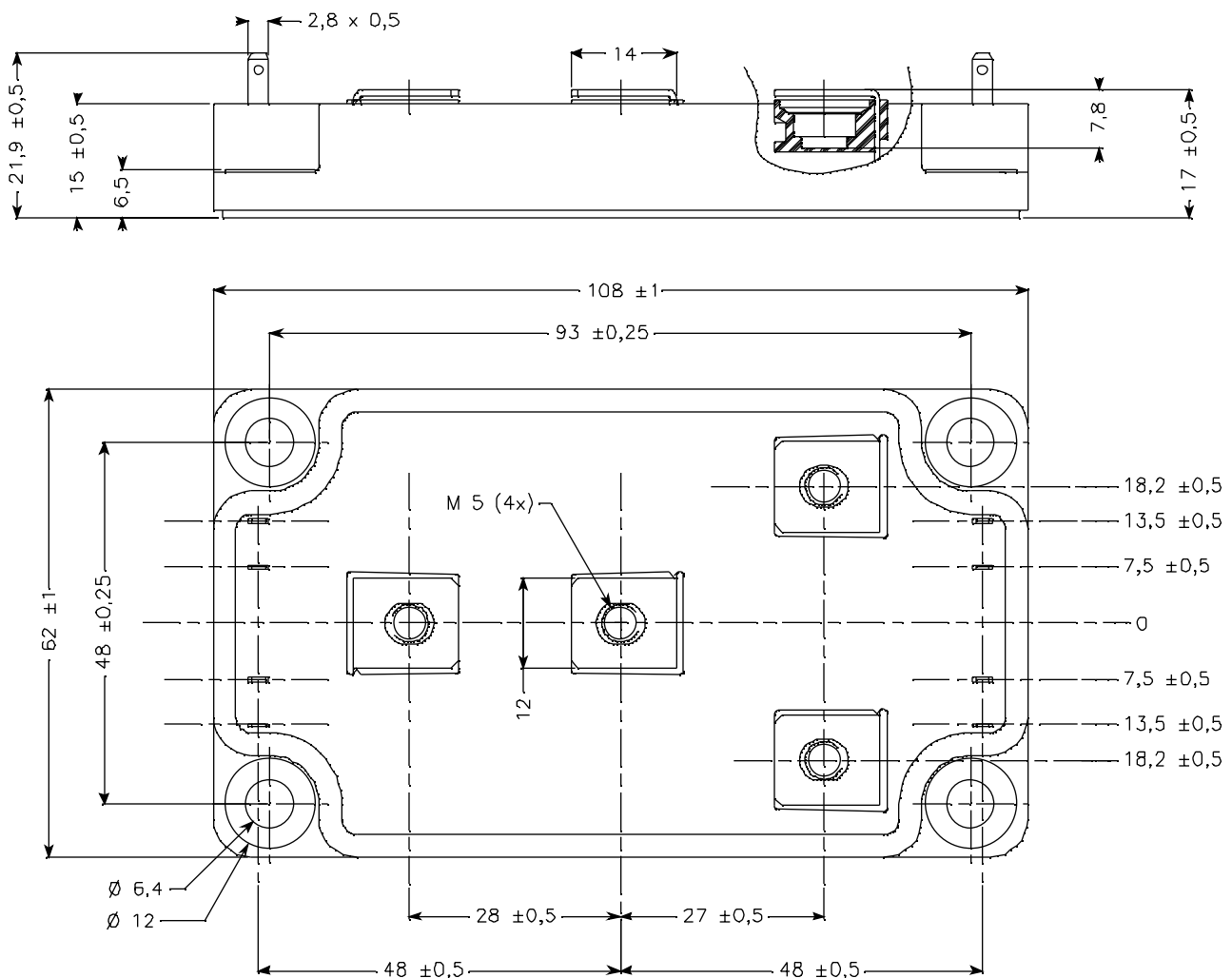
Symbol	Characteristic	Test Conditions	Min	Typ	Max	Unit
C_{iss}	Input Capacitance	$V_{GS} = 0V$		14		nF
C_{oss}	Output Capacitance	$V_{DS} = 25V$		2.8		
C_{rss}	Reverse Transfer Capacitance	$f = 1\text{MHz}$		0.2		
Q_g	Total gate Charge	$V_{GS} = 10V$		280		nC
Q_{gs}	Gate – Source Charge	$V_{Bus} = 250V$		80		
Q_{gd}	Gate – Drain Charge	$I_D = 99A$		140		
$T_{d(on)}$	Turn-on Delay Time	Inductive switching @ 125°C		21		ns
T_r	Rise Time	$V_{GS} = 15V$		38		
$T_{d(off)}$	Turn-off Delay Time	$V_{Bus} = 333V$		75		
T_f	Fall Time	$I_D = 99A$		93		
E_{on}	Turn-on Switching Energy	Inductive switching @ 25°C		2070		μJ
E_{off}	Turn-off Switching Energy	$V_{GS} = 15V, V_{Bus} = 333V$		1690		
E_{on}	Turn-on Switching Energy	Inductive switching @ 125°C		3112		μJ
E_{off}	Turn-off Switching Energy	$V_{GS} = 15V, V_{Bus} = 333V$		2026		

Diode ratings and characteristics

Symbol	Characteristic	Test Conditions		Min	Typ	Max	Unit
V_{RRM}	Maximum Peak Repetitive Reverse Voltage			600			V
I_{RM}	Maximum Reverse Leakage Current	$V_R = 600V$	$T_j = 25^\circ\text{C}$			250	μA
			$T_j = 125^\circ\text{C}$			500	
I_F	DC Forward Current		$T_c = 60^\circ\text{C}$		100		A
V_F	Diode Forward Voltage	$I_F = 100A$			1.6	1.8	V
		$I_F = 200A$			1.9		
		$I_F = 100A$	$T_j = 125^\circ\text{C}$		1.4		
t_{rr}	Reverse Recovery Time	$I_F = 100A$	$V_R = 400V$	$di/dt = 200A/\mu\text{s}$	$T_j = 25^\circ\text{C}$	180	ns
					$T_j = 125^\circ\text{C}$	220	
Q_{rr}	Reverse Recovery Charge	$I_F = 100A$	$V_R = 400V$	$di/dt = 200A/\mu\text{s}$	$T_j = 25^\circ\text{C}$	390	nC
					$T_j = 125^\circ\text{C}$	1450	

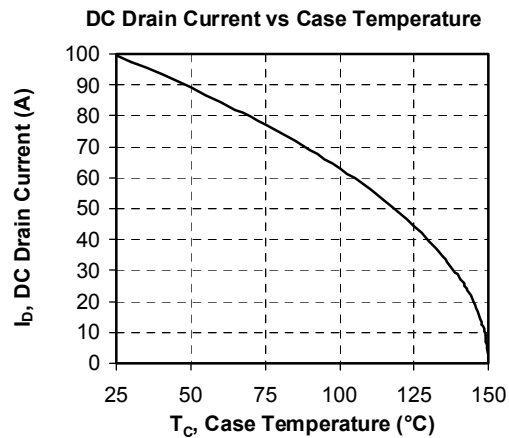
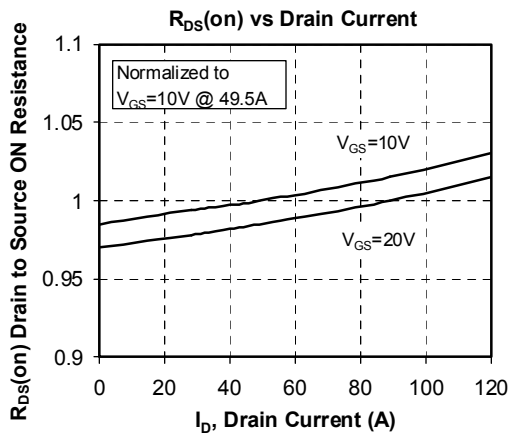
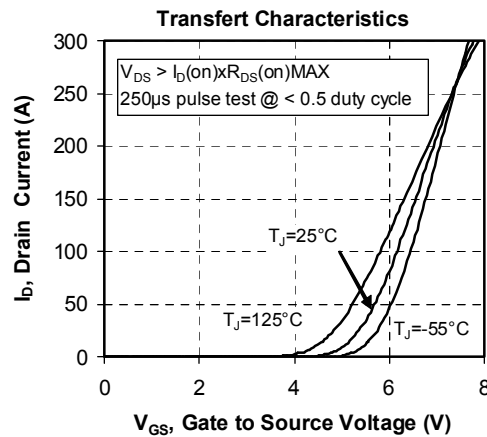
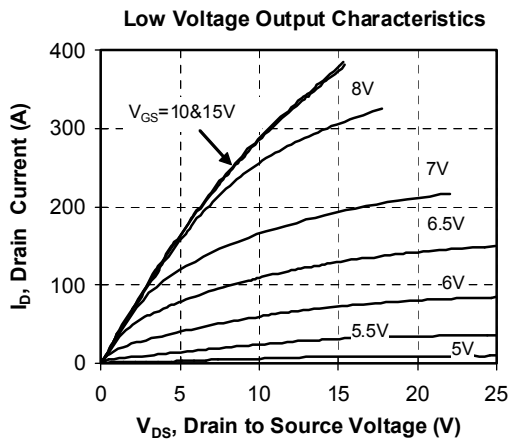
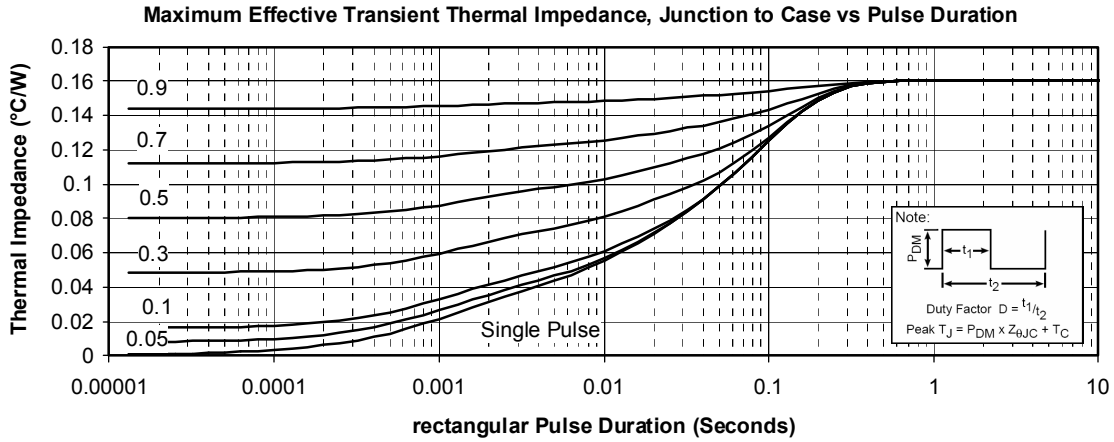
Thermal and package characteristics

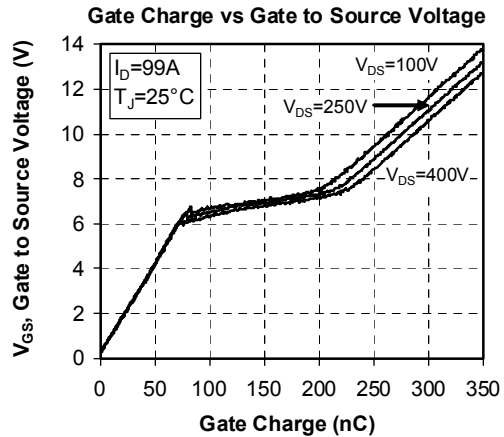
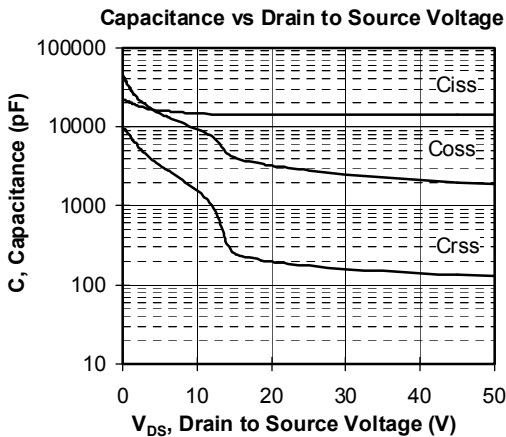
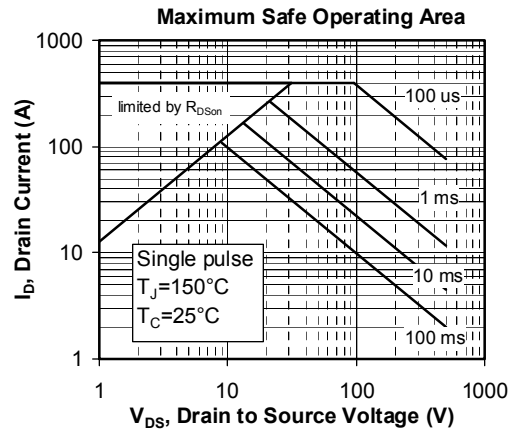
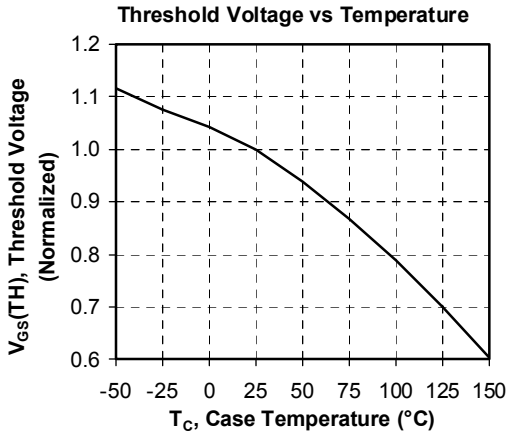
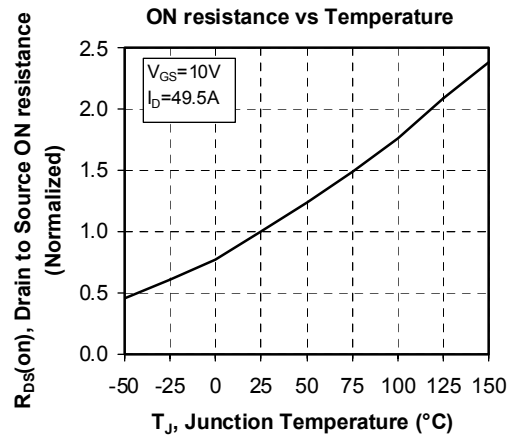
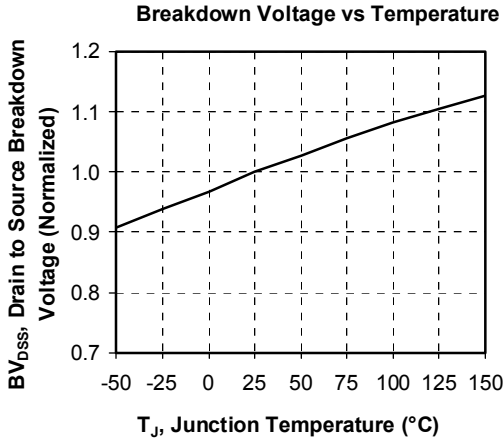
Symbol	Characteristic	Min	Typ	Max	Unit	
R _{thJC}	Junction to Case Thermal Resistance	Transistor		0.16	°C/W	
		Diode		0.6		
V _{ISOL}	RMS Isolation Voltage, any terminal to case t = 1 min, I _{isol} < 1 mA, 50/60Hz	2500			V	
T _J	Operating junction temperature range	-40		150	°C	
T _{STG}	Storage Temperature 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	

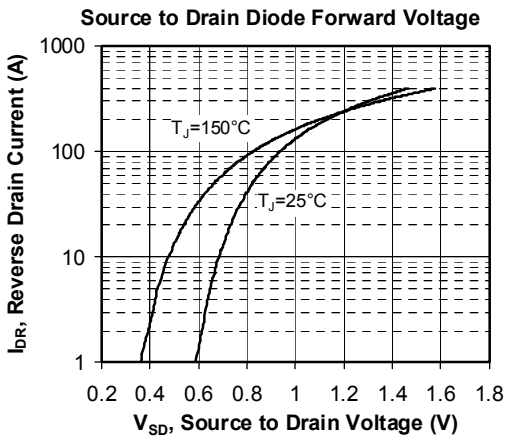
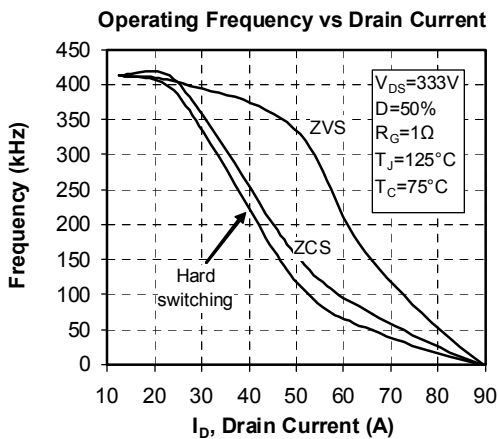
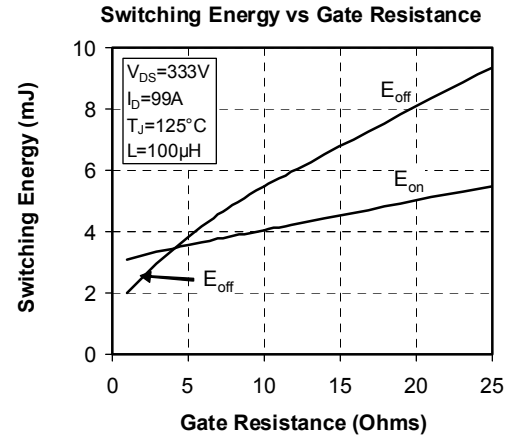
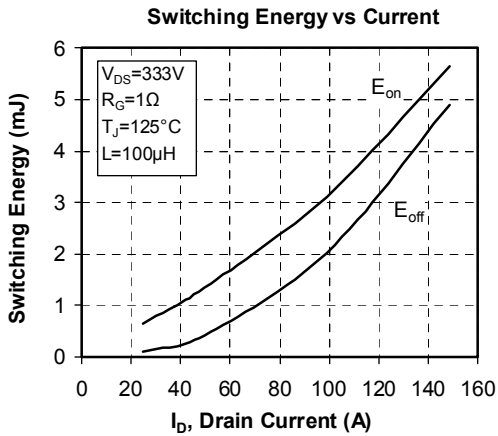
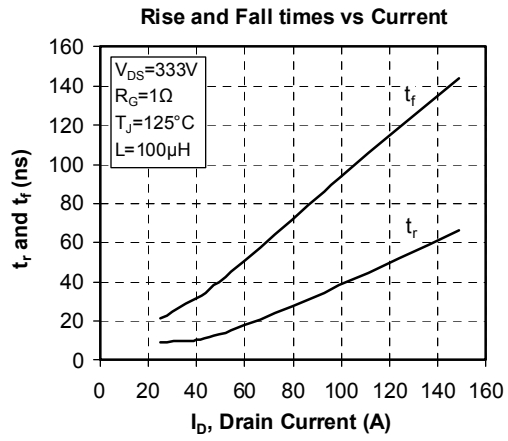
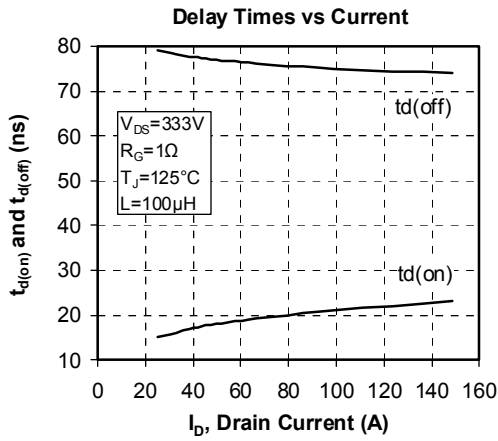
SP6 Package outline (dimensions in mm)


See application note APT0601 - Mounting Instructions for SP6 Power Modules on www.microsemi.com

Typical Performance Curve







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