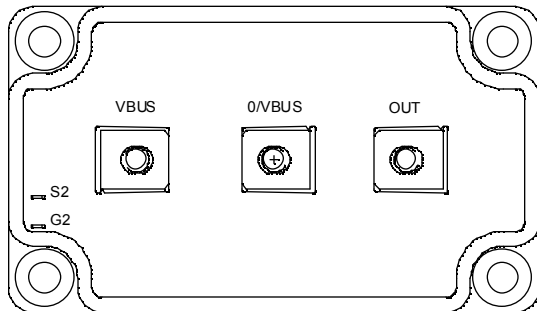
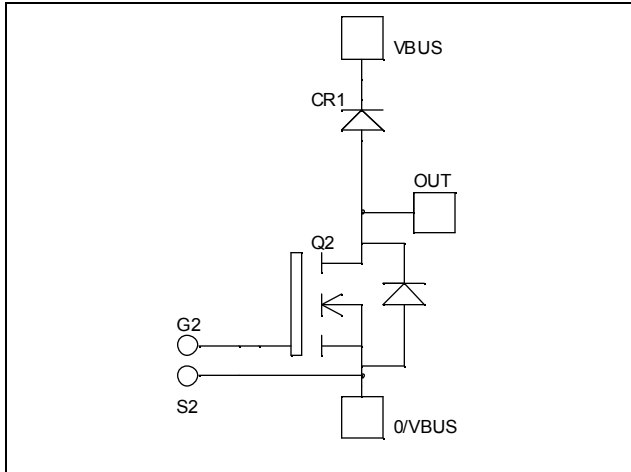


Boost chopper MOSFET Power Module

$$V_{DSS} = 200V$$

$$R_{DSon} = 5m\Omega \text{ typ @ } T_j = 25^\circ C$$

$$I_D = 317A \text{ @ } T_c = 25^\circ C$$



Application

- AC and DC motor control
- Switched Mode Power Supplies
- Power Factor Correction

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	200	V
I_D	Continuous Drain Current	$T_c = 25^\circ C$ 317	A
		$T_c = 80^\circ C$ 237	
I_{DM}	Pulsed Drain current	1268	
V_{GS}	Gate - Source Voltage	± 30	V
R_{DSon}	Drain - Source ON Resistance	6	m Ω
P_D	Maximum Power Dissipation	$T_c = 25^\circ C$ 1136	W
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	$V_{\text{GS}} = 0\text{V}, V_{\text{DS}} = 200\text{V}$			400	μA
		$V_{\text{GS}} = 0\text{V}, V_{\text{DS}} = 160\text{V}$			2000	
$R_{\text{DS(on)}}$	Drain – Source on Resistance	$V_{\text{GS}} = 10\text{V}, I_{\text{D}} = 158.5\text{A}$		5	6	$\text{m}\Omega$
$V_{\text{GS(th)}}$	Gate Threshold Voltage	$V_{\text{GS}} = V_{\text{DS}}, I_{\text{D}} = 10\text{mA}$	3		5	V
I_{GSS}	Gate – Source Leakage Current	$V_{\text{GS}} = \pm 30\text{V}, V_{\text{DS}} = 0\text{V}$			± 200	nA

Dynamic Characteristics

Symbol	Characteristic	Test Conditions	Min	Typ	Max	Unit
C_{iss}	Input Capacitance	$V_{\text{GS}} = 0\text{V}$ $V_{\text{DS}} = 25\text{V}$ $f = 1\text{MHz}$		27.4		nF
C_{oss}	Output Capacitance			8.72		
C_{rss}	Reverse Transfer Capacitance			0.38		
Q_{g}	Total gate Charge	$V_{\text{GS}} = 10\text{V}$ $V_{\text{Bus}} = 100\text{V}$ $I_{\text{D}} = 300\text{A}$		448		nC
Q_{gs}	Gate – Source Charge			172		
Q_{gd}	Gate – Drain Charge			188		
$T_{\text{d(on)}}$	Turn-on Delay Time	Inductive switching @ 125°C $V_{\text{GS}} = 15\text{V}$ $V_{\text{Bus}} = 133\text{V}$ $I_{\text{D}} = 300\text{A}$ $R_{\text{G}} = 1.2\Omega$		28		ns
T_{r}	Rise Time			56		
$T_{\text{d(off)}}$	Turn-off Delay Time			81		
T_{f}	Fall Time			99		
E_{on}	Turn-on Switching Energy	Inductive switching @ 25°C $V_{\text{GS}} = 15\text{V}, V_{\text{Bus}} = 133\text{V}$ $I_{\text{D}} = 300\text{A}, R_{\text{G}} = 1.2\Omega$		1852		μJ
E_{off}	Turn-off Switching Energy			1820		
E_{on}	Turn-on Switching Energy	Inductive switching @ 125°C $V_{\text{GS}} = 15\text{V}, V_{\text{Bus}} = 133\text{V}$ $I_{\text{D}} = 300\text{A}, R_{\text{G}} = 1.2\Omega$		2432		μJ
E_{off}	Turn-off Switching Energy			2124		

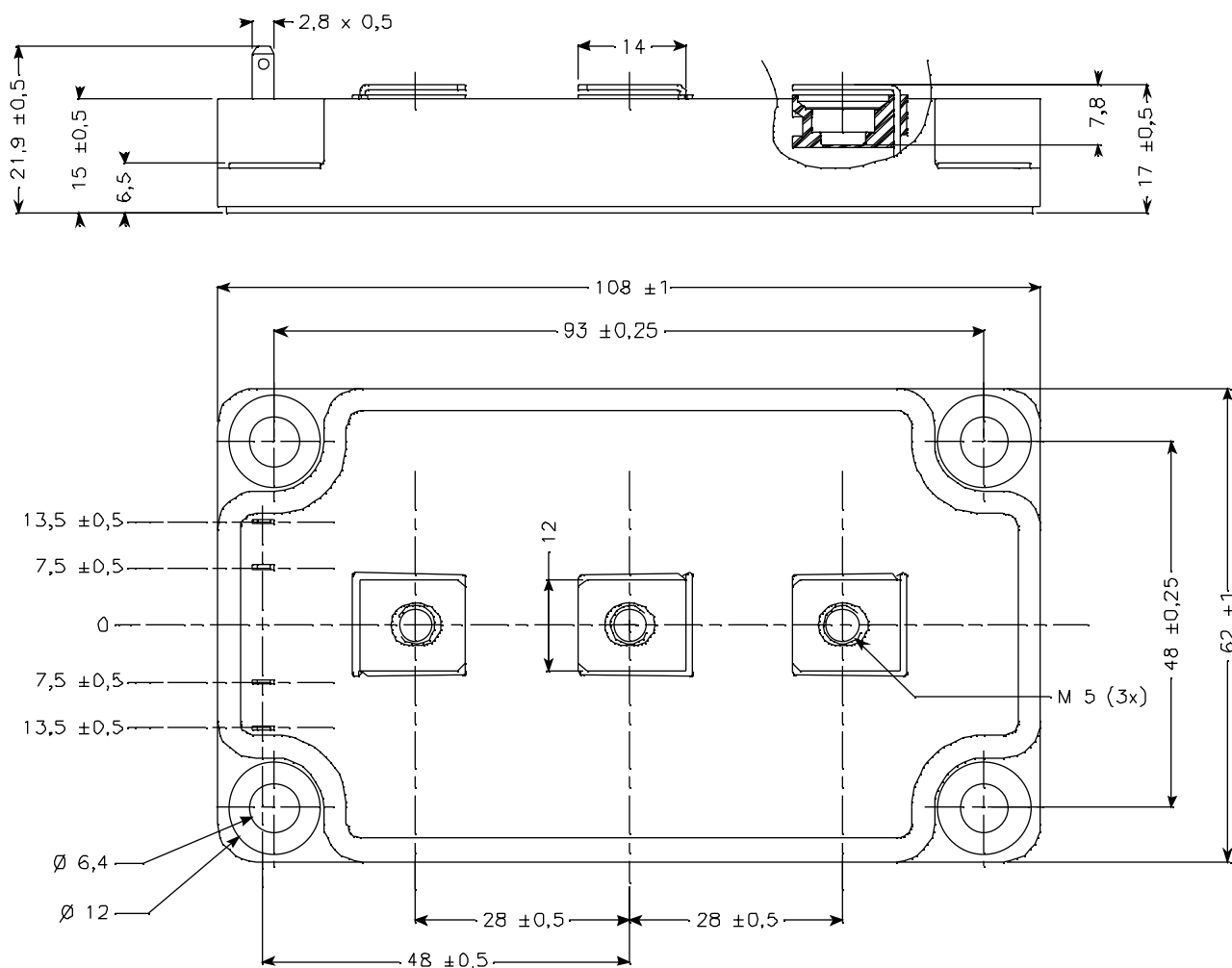
Chopper diode ratings and characteristics

Symbol	Characteristic	Test Conditions	Min	Typ	Max	Unit
V_{RRM}	Maximum Peak Repetitive Reverse Voltage		200			V
I_{RM}	Maximum Reverse Leakage Current	$V_{\text{R}} = 200\text{V}$	$T_j = 25^\circ\text{C}$		350	μA
			$T_j = 125^\circ\text{C}$		1000	
I_{F}	DC Forward Current	$T_c = 85^\circ\text{C}$		240		A
V_{F}	Diode Forward Voltage	$I_{\text{F}} = 240\text{A}$		1.1	1.15	V
		$I_{\text{F}} = 480\text{A}$		1.4		
		$I_{\text{F}} = 240\text{A}$	$T_j = 125^\circ\text{C}$	0.9		
t_{rr}	Reverse Recovery Time	$I_{\text{F}} = 240\text{A}$ $V_{\text{R}} = 133\text{V}$ $di/dt = 800\text{A}/\mu\text{s}$	$T_j = 25^\circ\text{C}$	31		ns
			$T_j = 125^\circ\text{C}$	60		
Q_{rr}	Reverse Recovery Charge	$I_{\text{F}} = 240\text{A}$ $V_{\text{R}} = 133\text{V}$ $di/dt = 800\text{A}/\mu\text{s}$	$T_j = 25^\circ\text{C}$	240		nC
			$T_j = 125^\circ\text{C}$	1000		

Thermal and package characteristics

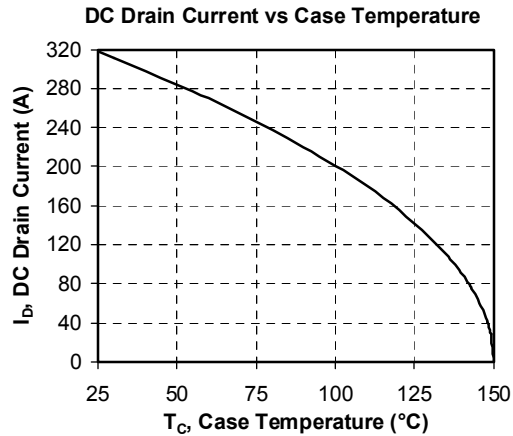
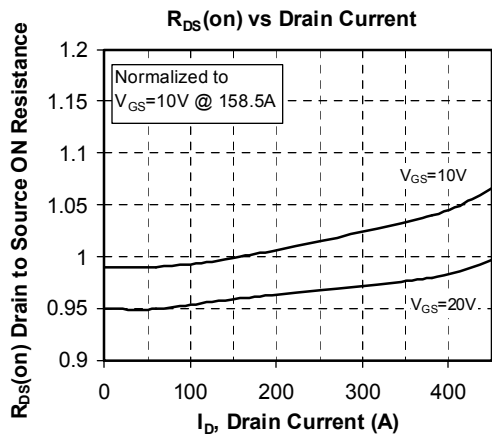
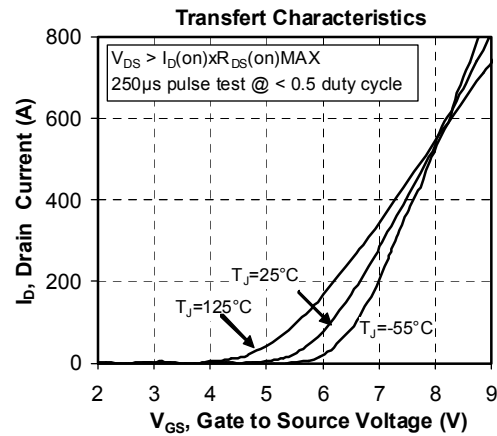
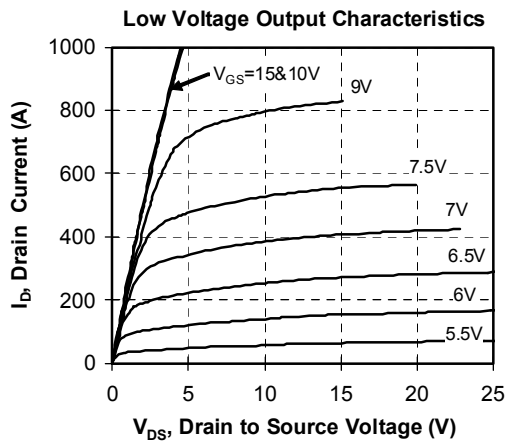
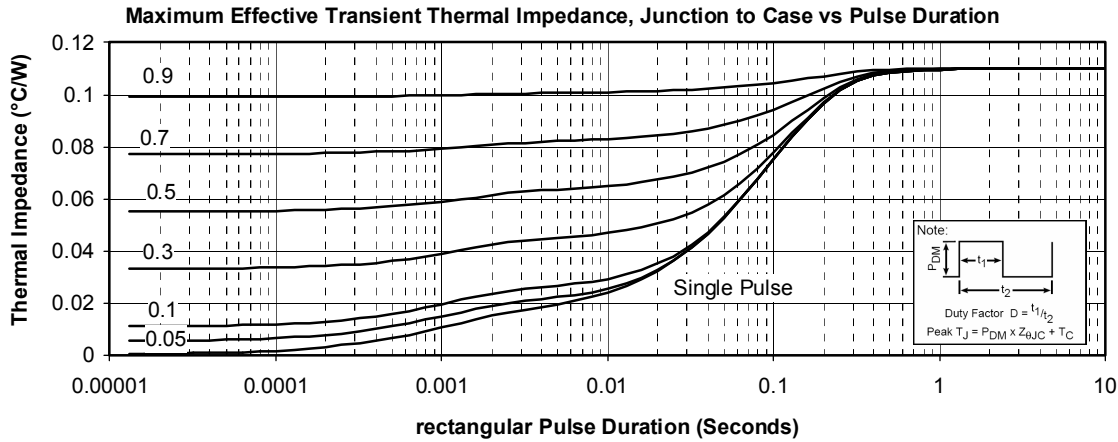
Symbol	Characteristic			Min	Typ	Max	Unit
R _{thJC}	Junction to Case Thermal Resistance		Transistor			0.11	°C/W
			Diode			0.23	
V _{ISOL}	RMS Isolation Voltage, any terminal to case t =1 min, I isol<1mA, 50/60Hz			2500			V
T _J	Operating junction temperature range			-40		150	°C
T _{STG}	Storage Temperature 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

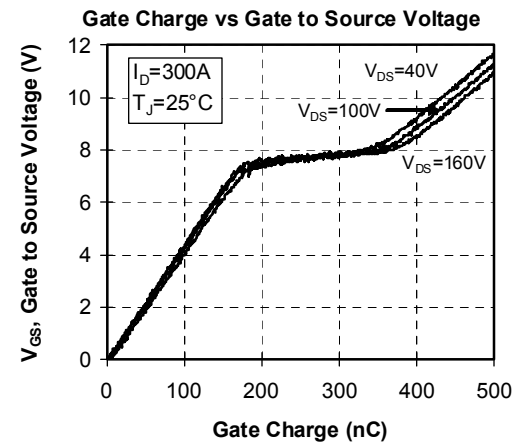
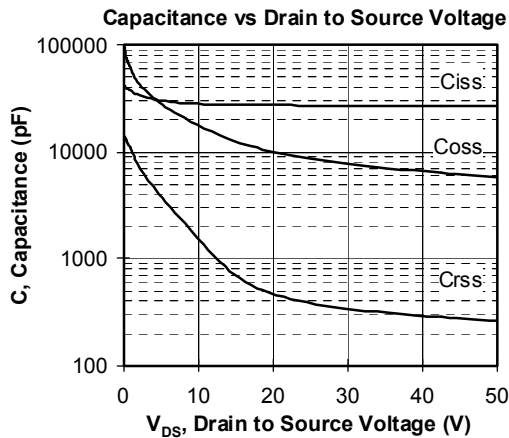
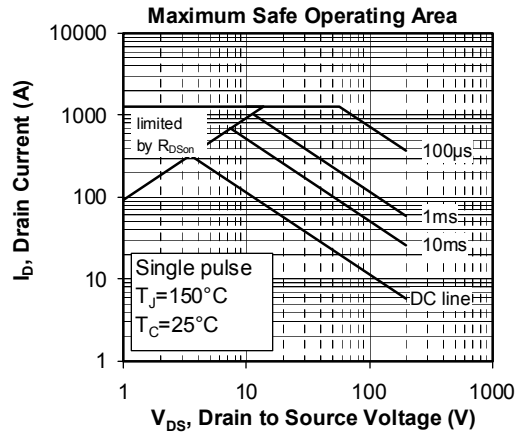
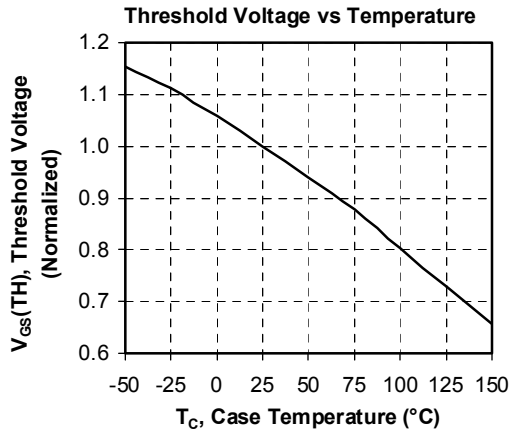
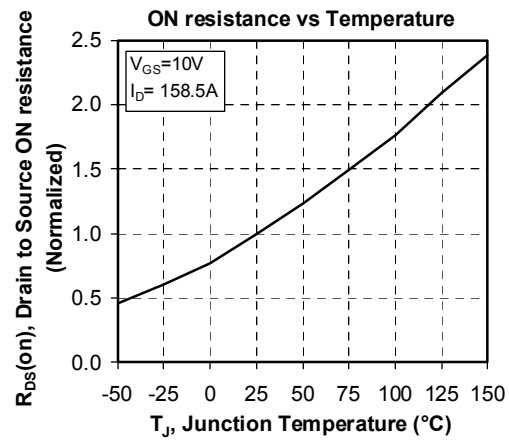
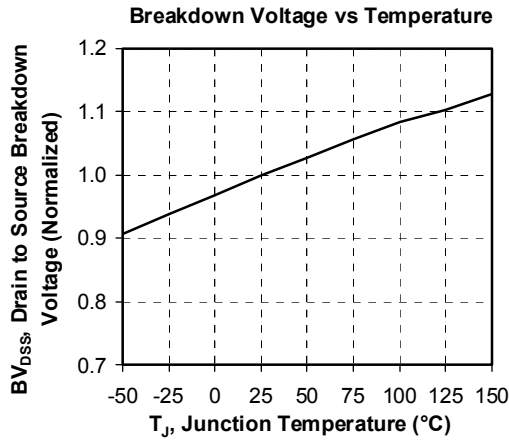
SP6 Package outline (dimensions in mm)

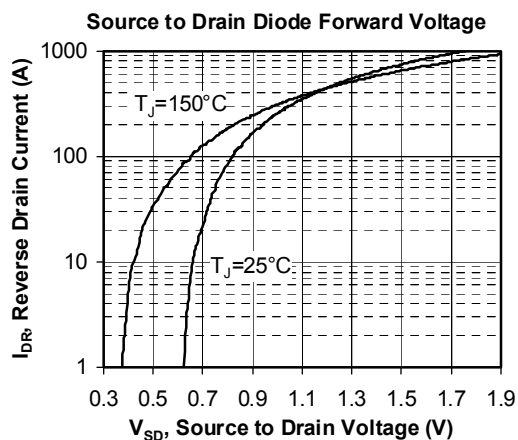
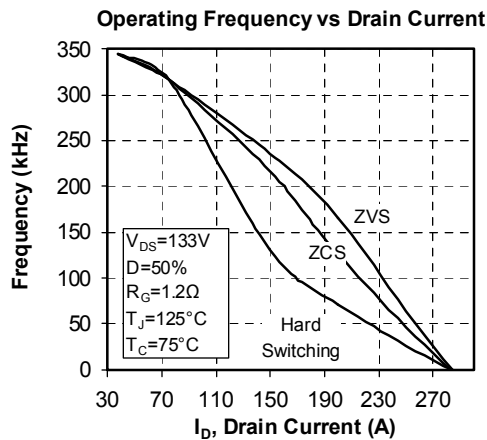
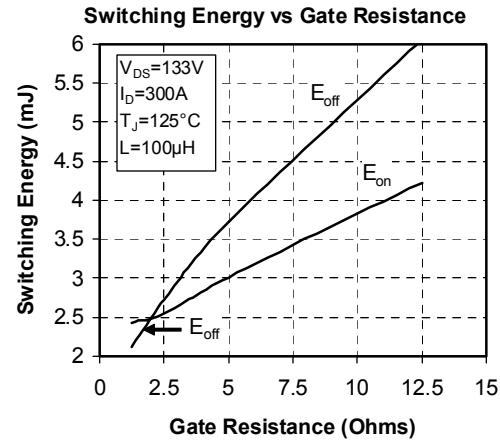
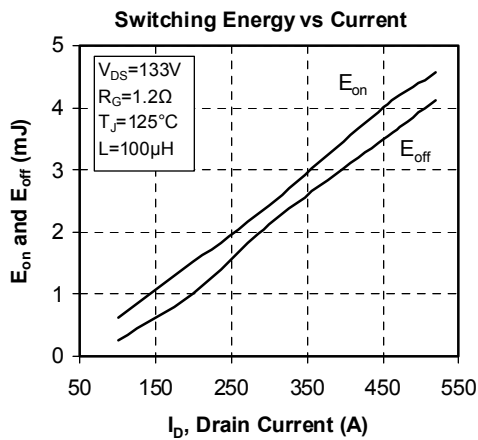
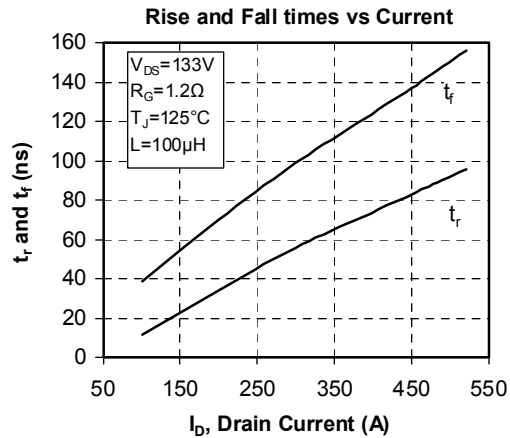
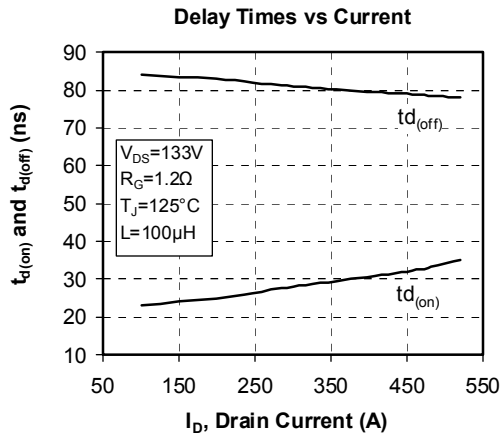


See application note APT0601 - Mounting Instructions for SP6 Power Modules on www.microsemi.com

Typical Performance Curve







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