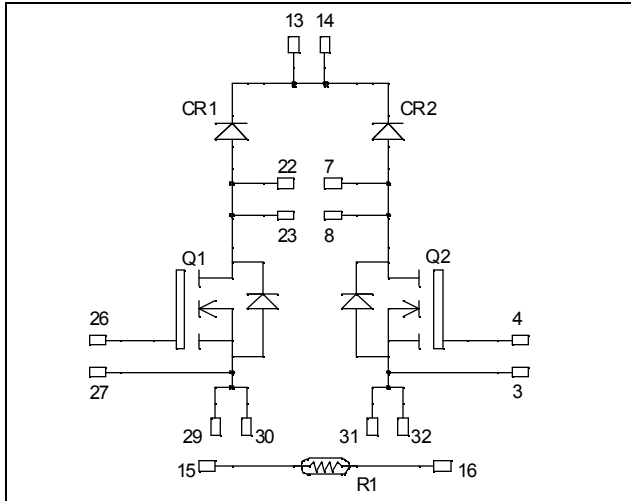


Dual Boost chopper MOSFET Power Module

$$V_{DSS} = 100V$$

$$R_{DSon} = 19m\Omega \text{ typ @ } T_j = 25^\circ C$$

$$I_D = 70A \text{ @ } T_c = 25^\circ C$$

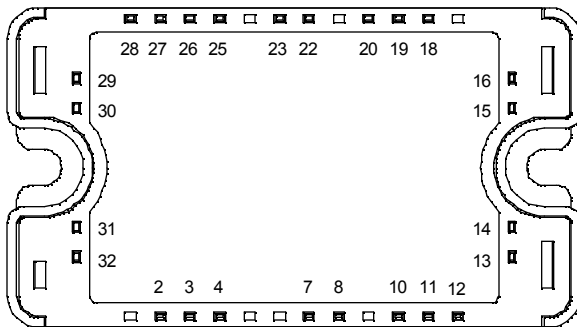


Application

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

Features

- Power MOS V[®] 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
- Internal thermistor for temperature monitoring
- High level of integration



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
- Each leg can be easily paralleled to achieve a single boost of twice the current capability
- RoHS Compliant

All multiple inputs and outputs must be shorted together
 Example: 13/14 ; 29/30 ; 22/23 ...

Absolute maximum ratings

Symbol	Parameter	Max ratings	Unit
V_{DSS}	Drain - Source Breakdown Voltage	100	V
I_D	Continuous Drain Current	$T_c = 25^\circ C$	A
		$T_c = 80^\circ C$	
I_{DM}	Pulsed Drain current	300	
V_{GS}	Gate - Source Voltage	± 30	V
R_{DSon}	Drain - Source ON Resistance	21	$m\Omega$
P_D	Maximum Power Dissipation	$T_c = 25^\circ C$	208
I_{AR}	Avalanche current (repetitive and non repetitive)	75	A
E_{AR}	Repetitive Avalanche Energy	30	mJ
E_{AS}	Single Pulse Avalanche Energy	1500	

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	$V_{GS} = 0V, V_{DS} = 100V$	$T_j = 25^\circ\text{C}$			250	μA
		$V_{GS} = 0V, V_{DS} = 80V$	$T_j = 125^\circ\text{C}$			1000	
$R_{DS(on)}$	Drain – Source on Resistance	$V_{GS} = 10V, I_D = 35A$			19	21	$\text{m}\Omega$
$V_{GS(th)}$	Gate Threshold Voltage	$V_{GS} = V_{DS}, I_D = 1\text{mA}$		2		4	V
I_{GSS}	Gate – Source Leakage Current	$V_{GS} = \pm 30V, V_{DS} = 0V$				± 100	nA

Dynamic Characteristics

Symbol	Characteristic	Test Conditions		Min	Typ	Max	Unit
C_{iss}	Input Capacitance	$V_{GS} = 0V$			5100		pF
C_{oss}	Output Capacitance	$V_{DS} = 25V$			1900		
C_{rss}	Reverse Transfer Capacitance	$f = 1\text{MHz}$			800		
Q_g	Total gate Charge	$V_{GS} = 10V$			200		nC
Q_{gs}	Gate – Source Charge	$V_{Bus} = 100V$			40		
Q_{gd}	Gate – Drain Charge	$I_D = 70A$			92		
$T_{d(on)}$	Turn-on Delay Time	Inductive switching @ 125°C $V_{GS} = 15V$ $V_{Bus} = 66V$ $I_D = 70A$ $R_G = 5\Omega$			35		ns
T_r	Rise Time				70		
$T_{d(off)}$	Turn-off Delay Time				95		
T_f	Fall Time				125		
E_{on}	Turn-on Switching Energy	Inductive switching @ 25°C $V_{GS} = 15V, V_{Bus} = 66V$ $I_D = 70A, R_G = 5\Omega$			276		μJ
E_{off}	Turn-off Switching Energy				302		
E_{on}	Turn-on Switching Energy	Inductive switching @ 125°C $V_{GS} = 15V, V_{Bus} = 66V$ $I_D = 70A, R_G = 5\Omega$			304		μJ
E_{off}	Turn-off Switching Energy				320		

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 _R =200V	T _j = 25°C			250	μA
			T _j = 125°C			500	
I _F	DC Forward Current		T _c = 80°C		60		A
V _F	Diode Forward Voltage	I _F = 60A			1.1		V
		I _F = 120A			1.4		
		I _F = 60A	T _j = 125°C		0.9		
t _{rr}	Reverse Recovery Time	I _F = 60A V _R = 133V di/dt =200A/μs	T _j = 25°C		31		ns
			T _j = 125°C		60		
Q _{rr}	Reverse Recovery Charge		T _j = 25°C		60		nC
			T _j = 125°C		250		

Thermal and package characteristics

Symbol Characteristic

			<i>Min</i>	<i>Typ</i>	<i>Max</i>	<i>Unit</i>
R_{thJC}	Junction to Case Thermal Resistance	Transistor			0.6	°C/W
		diode			0.9	
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	M4	2.5	4.7	N.m
Wt	Package Weight				110	g

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

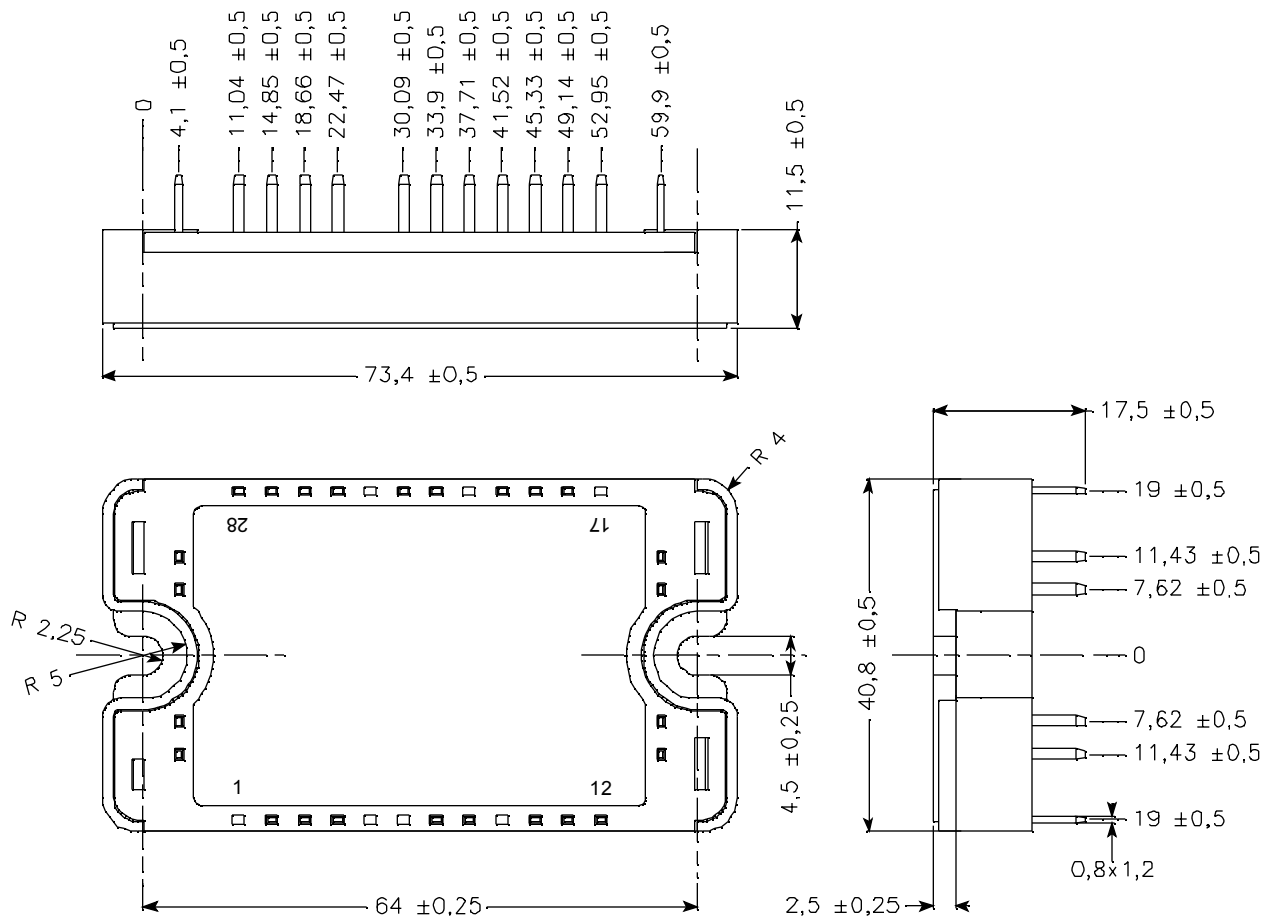
Symbol Characteristic

		<i>Min</i>	<i>Typ</i>	<i>Max</i>	<i>Unit</i>
R_{25}	Resistance @ 25°C		50		kΩ
$B_{25/85}$	$T_{25} = 298.15$ K		3952		K

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

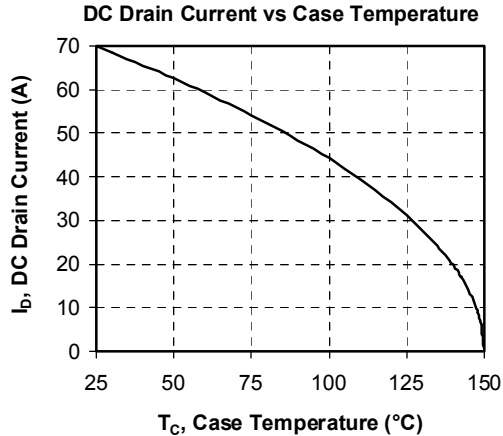
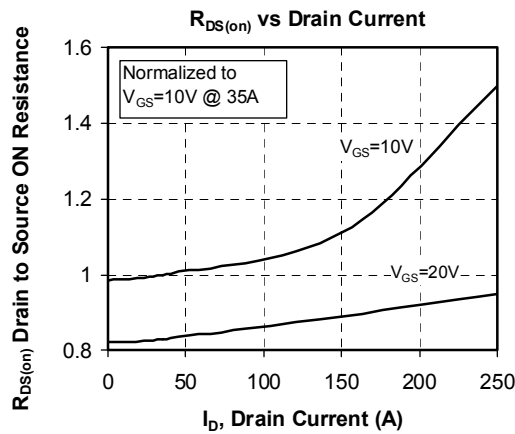
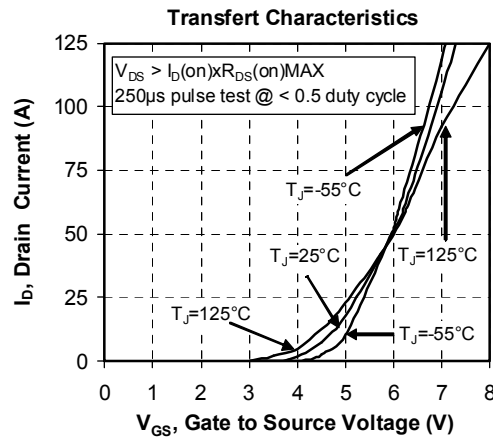
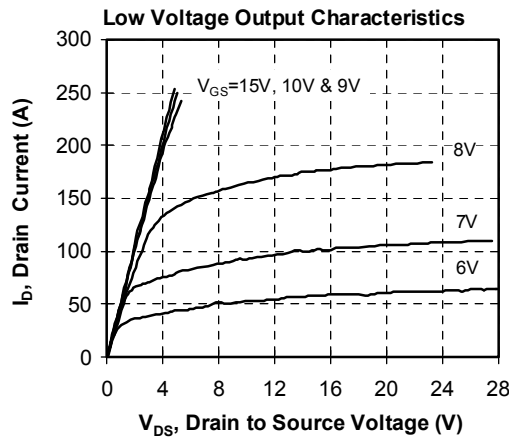
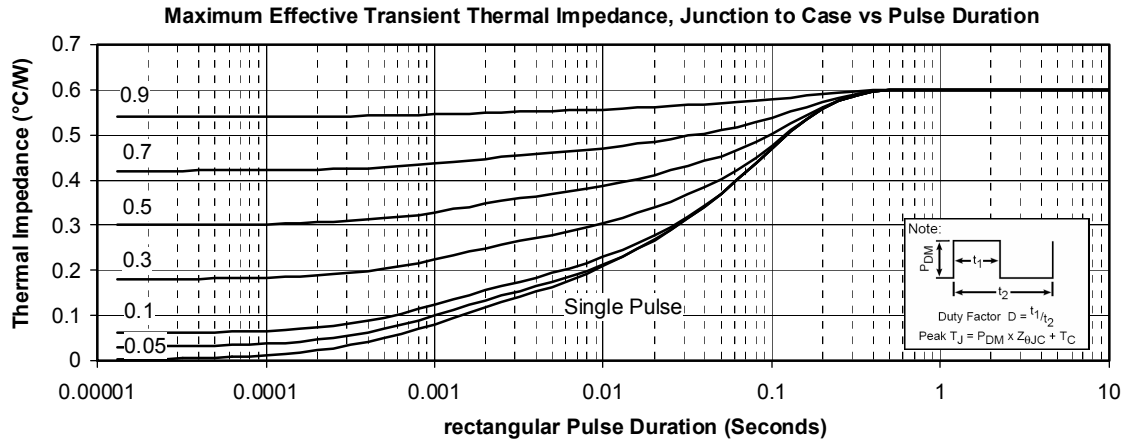
T: Thermistor temperature
 R_T : Thermistor value at T

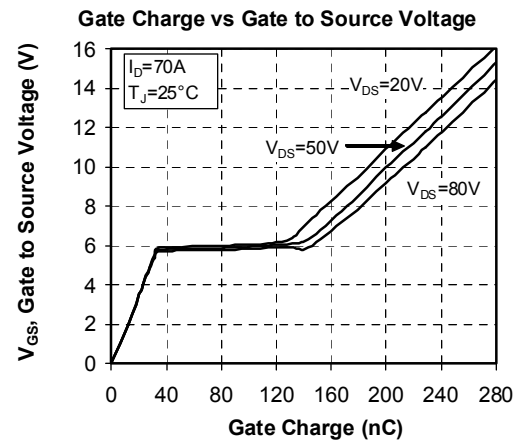
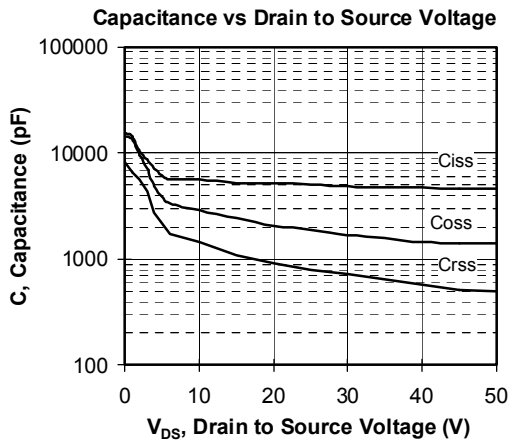
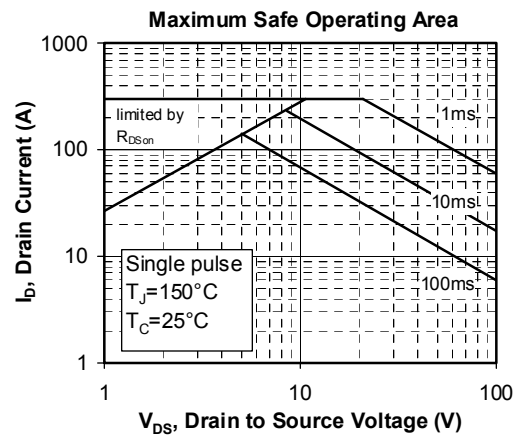
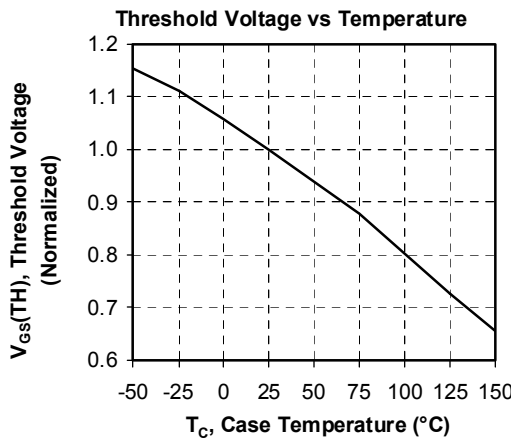
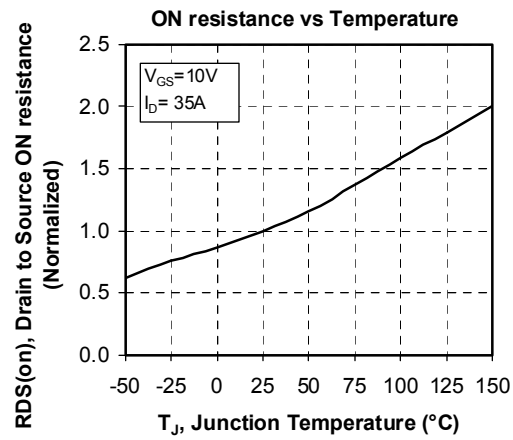
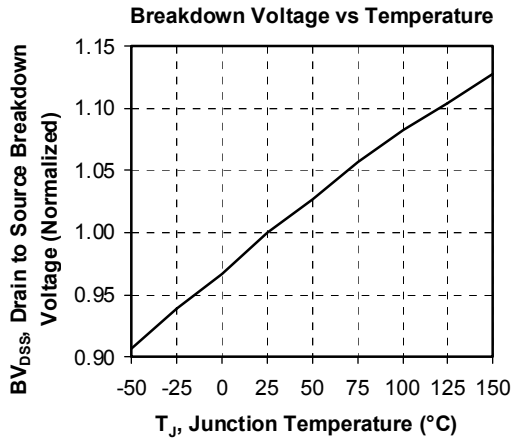
SP3 Package outline (dimensions in mm)

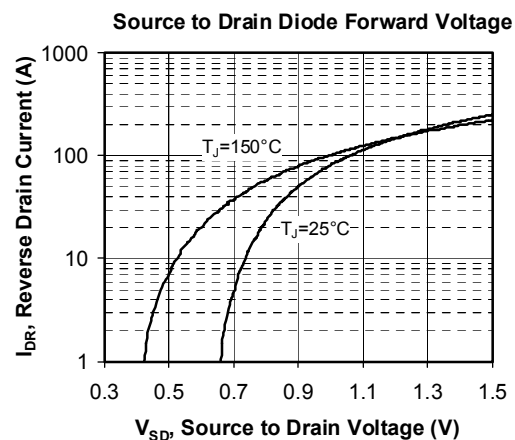
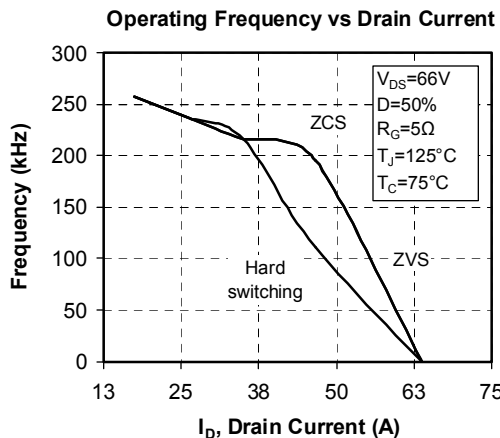
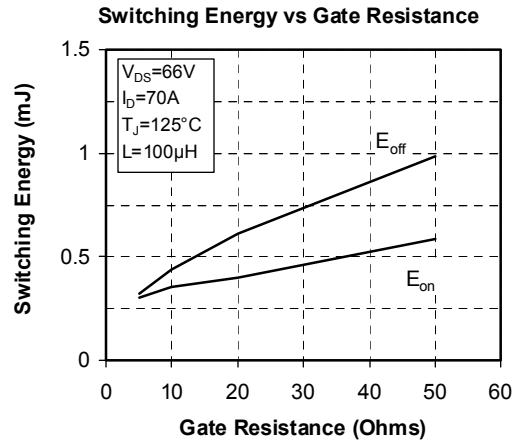
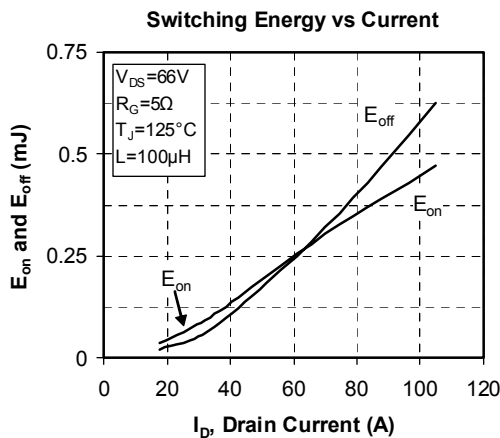
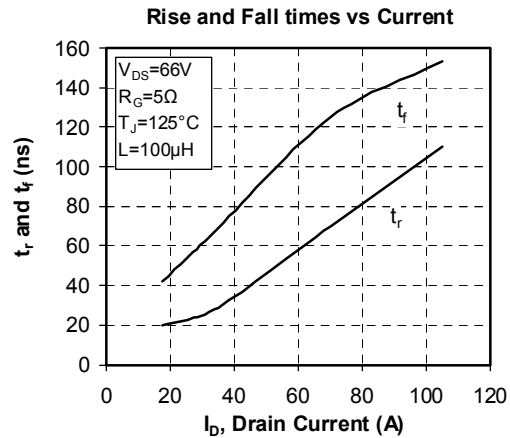
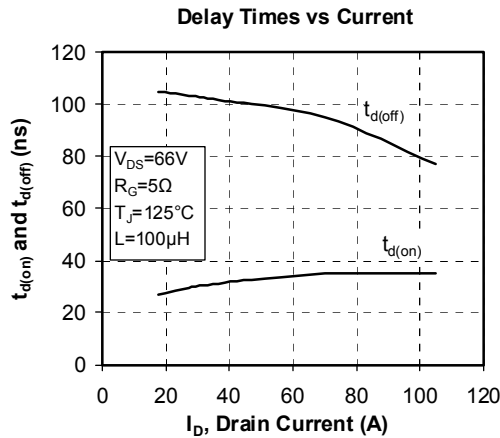


See application note 1901 - Mounting Instructions for SP3 Power Modules on www.microsemi.com

Typical Performance Curve







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