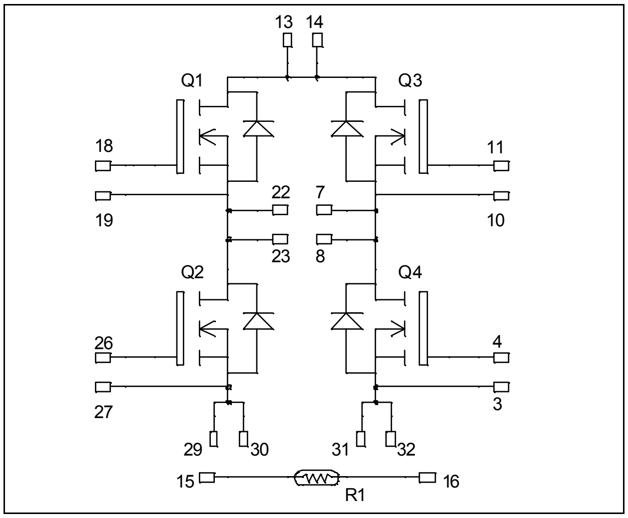
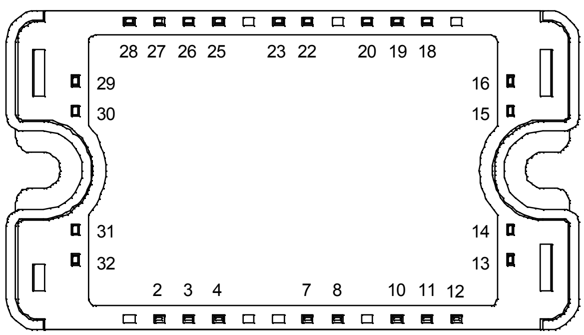
Microsemi
POWER PRODUCTS GROUP

APTM50H14FT3G

Full - Bridge MOSFET Power Module

V_{DSS} = 500V
R_{DSon} = 140mΩ typ @ Tj = 25°C
I_D = 26A @ Tc = 25°C





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

Application
- Welding converters
- Switched Mode Power Supplies
- Uninterruptible Power Supplies

Features
- Power MOS 7® FREDFETs
  - Low R_{DSon}
  - Low input and Miller capacitance
  - Low gate charge
  - Fast intrinsic reverse diode
  - 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 phase leg of twice the current capability
- 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°C	26	A
		T_c = 80°C	18	
I_{DM}	Pulsed Drain current		105	
V_{GS}	Gate - Source Voltage		±30	V
R_{DSon}	Drain - Source ON Resistance		168	mΩ
P_D	Maximum Power Dissipation	T_c = 25°C	208	W
I_{AR}	Avalanche current (repetitive and non repetitive)		35	A
E_{AR}	Repetitive Avalanche Energy		30	mJ
E_{AS}	Single Pulse Avalanche Energy		1300	

CAUTION: These Devices are sensitive to Electrostatic Discharge. Proper Handing Procedures Should Be Followed. See application note APT0502 on www.microsemi.com

All ratings @ $T_j = 25°C$ unless otherwise specified

Electrical Characteristics

Symbol	*Characteristic*	*Test Conditions*		*Min*	*Typ*	*Max*	*Unit*
I_{DSS}	Zero Gate Voltage Drain Current	$V_{GS} = 0V, V_{DS} = 500V$	$T_j = 25°C$			100	µA
		$V_{GS} = 0V, V_{DS} = 400V$	$T_j = 125°C$			500	
$R_{DS(on)}$	Drain – Source on Resistance	$V_{GS} = 10V, I_D = 13A$			140	168	mΩ
$V_{GS(th)}$	Gate Threshold Voltage	$V_{GS} = V_{DS}, I_D = 1mA$		3		5	V
I_{GSS}	Gate – Source Leakage Current	$V_{GS} = ±30 V, V_{DS} = 0V$				±100	nA

Dynamic Characteristics

Symbol	*Characteristic*	*Test Conditions*	*Min*	*Typ*	*Max*	*Unit*
C_{iss}	Input Capacitance	$V_{GS} = 0V$ $V_{DS} = 25V$ f = 1MHz		3259		pF
C_{oss}	Output Capacitance			709		
C_{rss}	Reverse Transfer Capacitance			51		
Q_g	Total gate Charge	$V_{GS} = 10V$ $V_{Bus} = 250V$ $I_D = 26A$		72		nC
Q_{gs}	Gate – Source Charge			20		
Q_{gd}	Gate – Drain Charge			36		
$T_{d(on)}$	Turn-on Delay Time	**Inductive switching @ 125°C** $V_{GS} = 15V$ $V_{Bus} = 333V$ $I_D = 26A$ $R_G = 5Ω$		10		ns
T_r	Rise Time			17		
$T_{d(off)}$	Turn-off Delay Time			50		
T_f	Fall Time			41		
E_{on}	Turn-on Switching Energy	**Inductive switching @ 25°C** $V_{GS} = 15V, V_{Bus} = 333V$ $I_D = 26A, R_G = 5Ω$		326		µJ
E_{off}	Turn-off Switching Energy			250		
E_{on}	Turn-on Switching Energy	**Inductive switching @ 125°C** $V_{GS} = 15V, V_{Bus} = 333V$ $I_D = 26A, R_G = 5Ω$		548		µJ
E_{off}	Turn-off Switching Energy			288		

Source - Drain diode ratings and characteristics

Symbol	*Characteristic*	*Test Conditions*		*Min*	*Typ*	*Max*	*Unit*
I_S	Continuous Source current (Body diode)		Tc = 25°C		26		A
			Tc = 80°C		18		
V_{SD}	Diode Forward Voltage	$V_{GS} = 0V, I_S = - 26A$				1.3	V
dv/dt	Peak Diode Recovery ❶					15	V/ns
t_{rr}	Reverse Recovery Time	$I_S = - 26A$ $V_R = 333V$ $di_S/dt = 100A/µs$	$T_j = 25°C$			250	ns
			$T_j = 125°C$			525	
Q_{rr}	Reverse Recovery Charge		$T_j = 25°C$		1.6		µC
			$T_j = 125°C$		6		

❶ dv/dt numbers reflect the limitations of the circuit rather than the device itself.
$I_S \leq - 26A$ $di/dt \leq 700A/µs$ $V_R \leq V_{DSS}$ $T_j \leq 150°C$

Thermal and package characteristics

Symbol	*Characteristic*			*Min*	*Typ*	*Max*	*Unit*
R_{thJC}	Junction to Case Thermal Resistance					0.60	°C/W
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

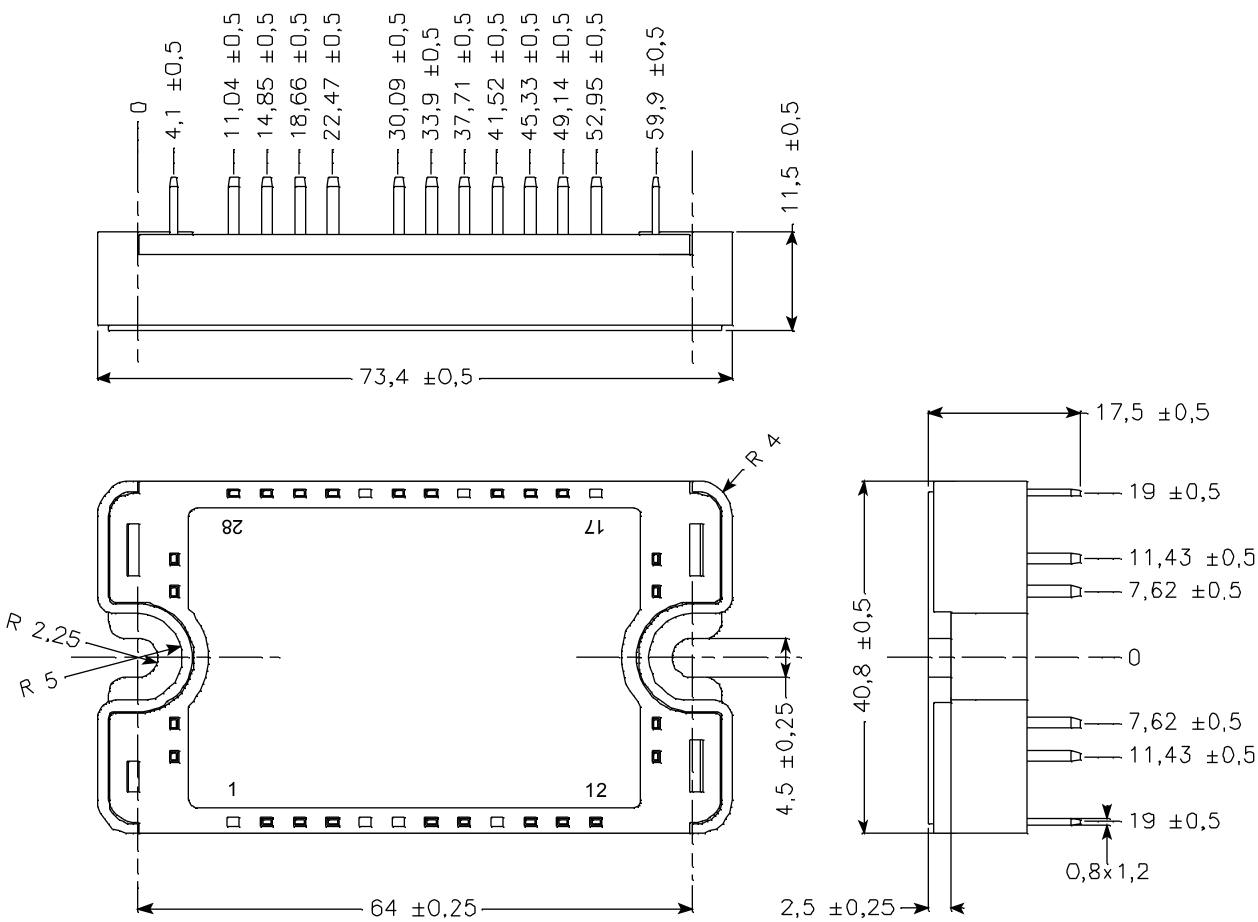
Temperature sensor NTC (see application note APT0406 on www.microsemi.com for more information).

Symbol	*Characteristic*	*Min*	*Typ*	*Max*	*Unit*
R_{25}	Resistance @ 25°C		50		kΩ
$B_{25/85}$	T_{25} = 298.15 K		3952		K

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

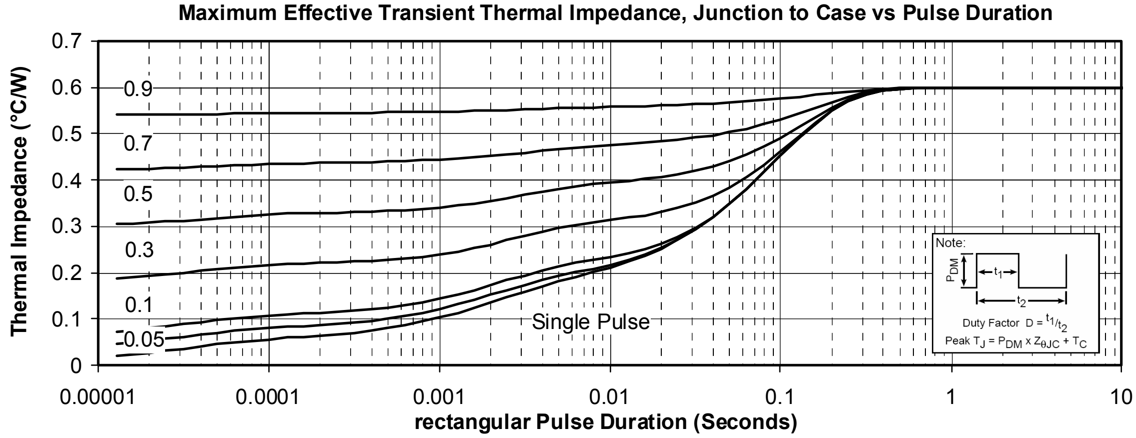
T: Thermistor temperature
R_T: Thermistor value at T

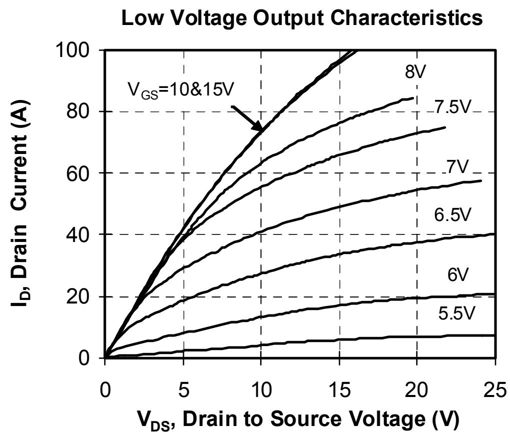
SP3 Package outline (dimensions in mm)

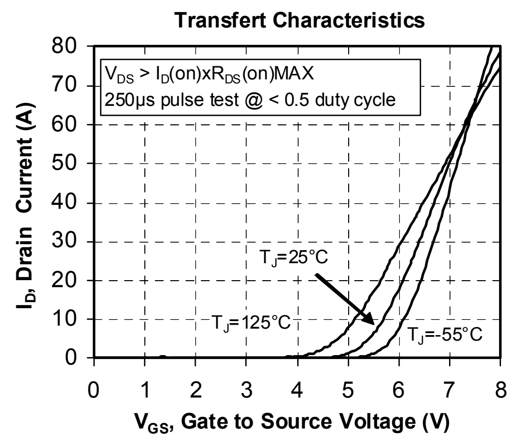


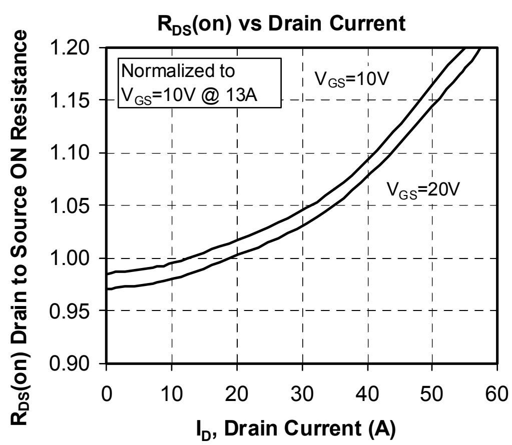
See application note 1901 - Mounting Instructions for SP3 Power Modules on www.microsemi.com

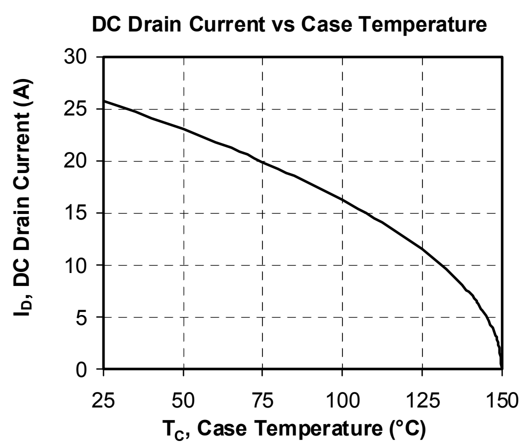
Typical Performance Curve

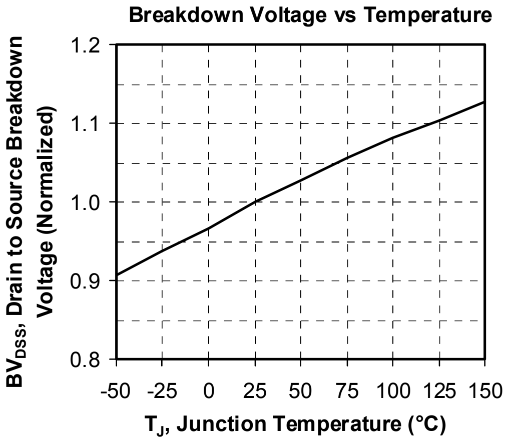


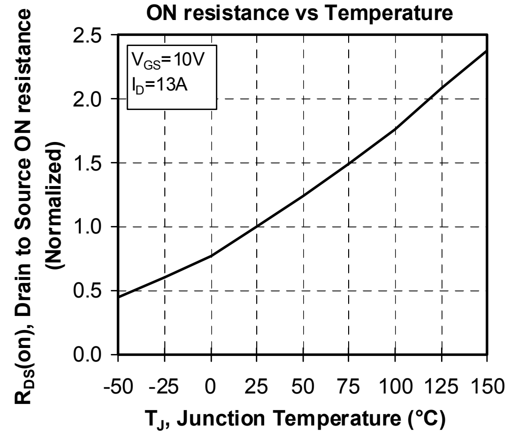


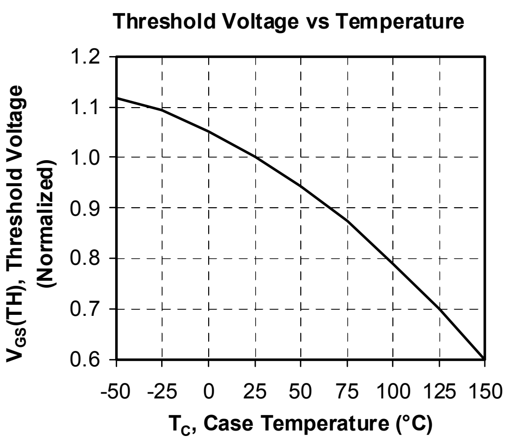


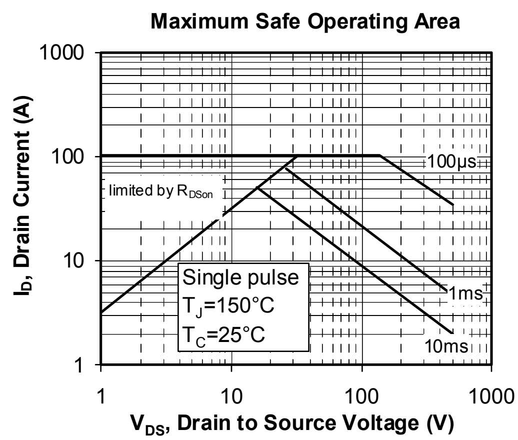


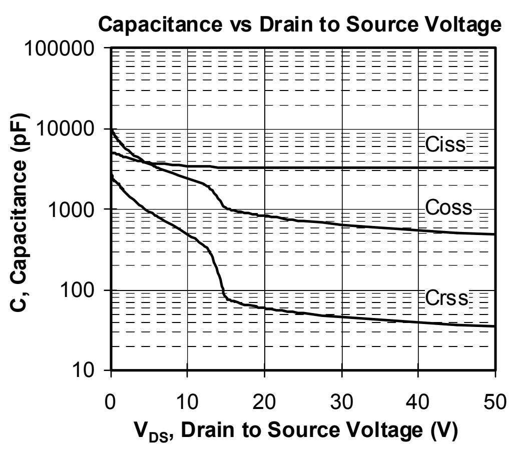


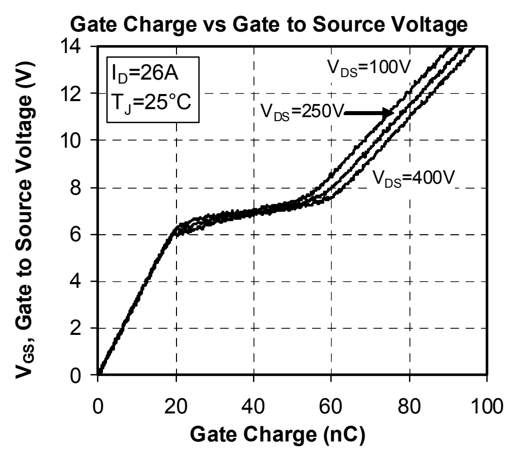

Breakdown Voltage vs Temperature
BVDSS, Drain to Source Breakdown Voltage (Normalized)
1.2
1.1
1.0
0.9
0.8
-50 -25 0 25 50 75 100 125 150
TJ, Junction Temperature (°C)


ON resistance vs Temperature
RDS(on), Drain to Source ON resistance (Normalized)
VGS=10V
ID=13A
2.5
2.0
1.5
1.0
0.5
0.0
-50 -25 0 25 50 75 100 125 150
TJ, Junction Temperature (°C)

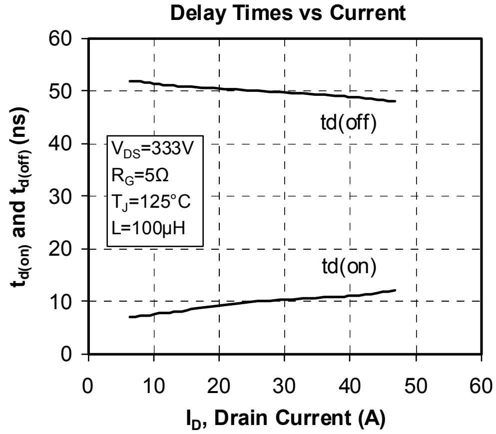

Threshold Voltage vs Temperature
VGS(TH), Threshold Voltage (Normalized)
1.2
1.1
1.0
0.9
0.8
0.7
0.6
-50 -25 0 25 50 75 100 125 150
TC, Case Temperature (°C)


Maximum Safe Operating Area
ID, Drain Current (A)
1000
100
10
1
limited by RDSon
100µs
1ms
10ms
Single pulse
TJ=150°C
TC=25°C
1 10 100 1000
VDS, Drain to Source Voltage (V)

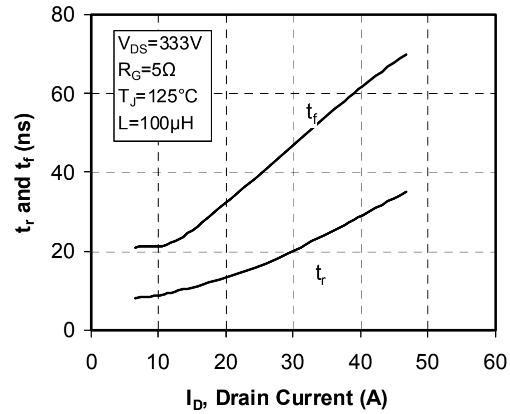

Capacitance vs Drain to Source Voltage
C, Capacitance (pF)
100000
10000
1000
100
10
Ciss
Coss
Crss
0 10 20 30 40 50
VDS, Drain to Source Voltage (V)


Gate Charge vs Gate to Source Voltage
VGS, Gate to Source Voltage (V)
ID=26A
TJ=25°C
VDS=100V
VDS=250V
VDS=400V
14
12
10
8
6
4
2
0
0 20 40 60 80 100
Gate Charge (nC)

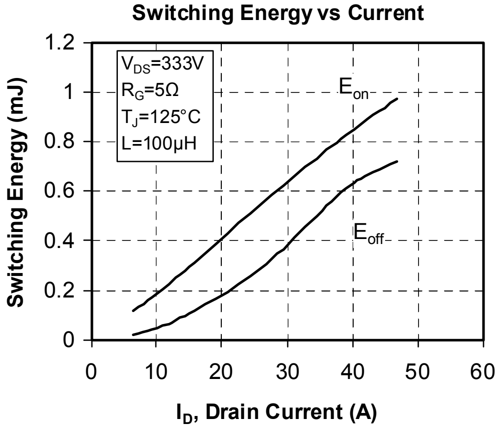
Delay Times vs Current



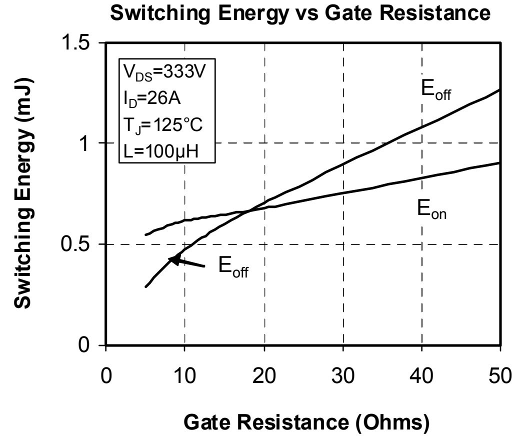
Rise and Fall times vs Current



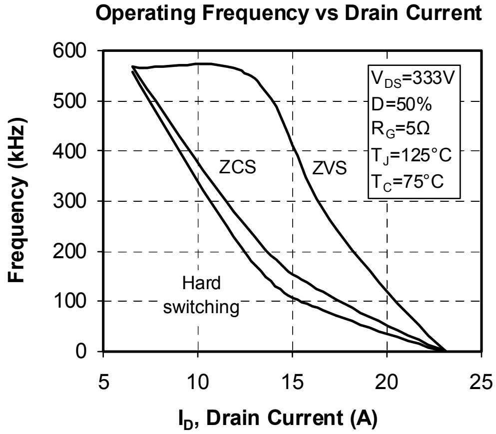
Switching Energy vs Current



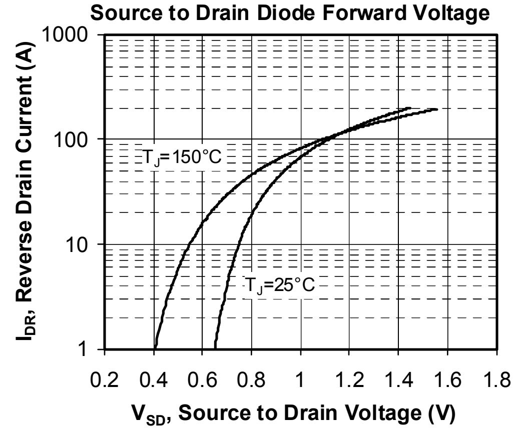
Switching Energy vs Gate Resistance



Operating Frequency vs Drain Current



Source to Drain Diode Forward Voltage



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Общество с ограниченной ответственностью «МосЧип» ИНН 7719860671 / КПП 771901001
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Данный компонент на территории Российской Федерации

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Для оперативного оформления запроса Вам необходимо перейти по данной ссылке:

http://moschip.ru/get-element

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