

Features

- High Density Cell Design For Ultra Low $R_{DS(on)}$
- High Speed Switching
- ESD Protected Up to 2.5KV (HBM)
- Trench Power LV MOSFET Technology
- Epoxy Meets UL 94 V-0 Flammability Rating
- Moisture Sensitivity Level 1
- Halogen Free. "Green" Device (Note 1)
- Lead Free Finish/RoHS Compliant ("P" Suffix Designates RoHS Compliant. See Ordering Information)

Maximum Ratings

- Operating Junction Temperature Range : -55°C to +150°C
- Storage Temperature Range: -55°C to +150°C
- Thermal Resistance: 96°C/W Junction to Ambient^(Note 2)

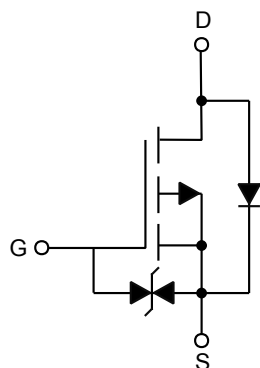
Parameter	Symbol	Rating	Unit
Drain-Source Voltage	V_{DS}	-20	V
Gate-Source Voltage	V_{GS}	±12	V
Drain Current $T_A=25^\circ\text{C}$ Steady State	I_D	-5.6	A
$T_A=70^\circ\text{C}$ Steady State		-4.5	
Pulsed Drain Current ^(Note 3)	I_{DM}	-23	A
Total Power Dissipation	P_D	1.3	W

Note: 1. Halogen free "Green" products are defined as those which contain <900ppm bromine, <900ppm chlorine (<1500ppm total Br + Cl) and <1000ppm antimony compounds.

2. Device mounted on FR-4 PCB, 1 inch x 0.85 inch x 0.062 inch.

3. Pulse Test: Pulse Width ≤ 300us, Duty cycle ≤ 2%.

Internal Structure:

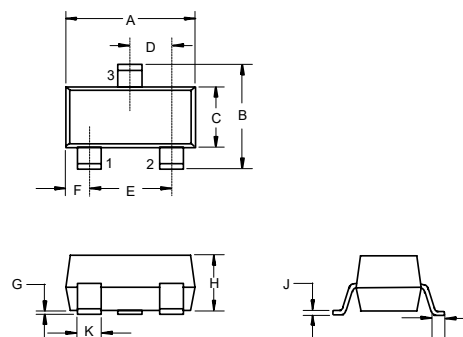


1. GATE
2. SOURCE
3. DRAIN

Marking: 3415.

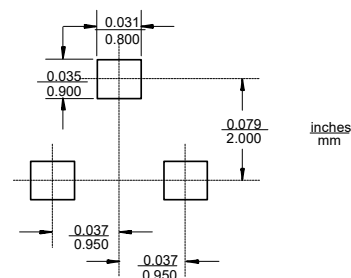
P-Channel Enhancement Mode Field Effect Transistor

SOT-23



DIMENSIONS					
DIM	INCHES		MM		NOTE
	MIN	MAX	MIN	MAX	
A	0.110	0.120	2.80	3.04	
B	0.083	0.104	2.10	2.64	
C	0.047	0.055	1.20	1.40	
D	0.034	0.041	0.85	1.05	
E	0.067	0.083	1.70	2.10	
F	0.018	0.024	0.45	0.60	
G	0.0004	0.006	0.01	0.15	
H	0.035	0.043	0.90	1.10	
J	0.003	0.007	0.08	0.18	
K	0.012	0.020	0.30	0.51	
L	0.007	0.020	0.20	0.50	

Suggested Solder Pad Layout



Electrical Characteristics @ 25°C (Unless Otherwise Specified)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Static Characteristics						
Drain-Source Breakdown Voltage	V _{(BR)DSS}	V _{GS} =0V, I _D =250μA	-20			V
Gate-Source Leakage Current	I _{GSS}	V _{DS} =0V, V _{GS} =± 10V		±2.5	±10	μA
		V _{DS} =0V, V _{GS} =± 8V		±0.9	±2	μA
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} =-20V, V _{GS} =0V			-1	μA
Gate-Threshold Voltage	V _{GS(th)}	V _{DS} =V _{GS} , I _D =-250μA	-0.40	-0.62	-1.0	V
Drain-Source On-Resistance	R _{DS(on)}	V _{GS} =-4.5V, I _D =-5.6A		29	42	mΩ
		V _{GS} =-2.5V, I _D =-4.3A		36	55	
		V _{GS} =-1.8V, I _D =-2A		55	100	
Diode Forward Voltage	V _{SD}	V _{GS} =0V, I _S =-5.6A		-0.8	-1.2	V
Maximum Body-Diode Continuous Current	I _S				-5.6	A
Dynamic Characteristics						
Input Capacitance	C _{iss}	V _{DS} =-10V,V _{GS} =0V,f =1MHz		940		pF
Output Capacitance	C _{oss}			219		
Reverse Transfer Capacitance	C _{rss}			116		
Switching Characteristics						
Total Gate Charge	Q _g	V _{DS} =-10V,V _{GS} =-4.5V,I _D =-4A		7.2		nC
Gate-Source Charge	Q _{gs}			1.2		
Gate-Drain Charge	Q _{gd}			1.6		
Turn-On Delay Time	t _{d(on)}	V _{GS} =-4.5V,V _{DS} =-10V,R _L =2.5Ω, R _{GEN} =3Ω		15		ns
Turn-On Rise Time	t _r			63		
Turn-Off Delay Time	t _{d(off)}			21		
Turn-Off Fall Time	t _f			12		

Curve Characteristics

Fig. 1 - Typical Output Characteristics

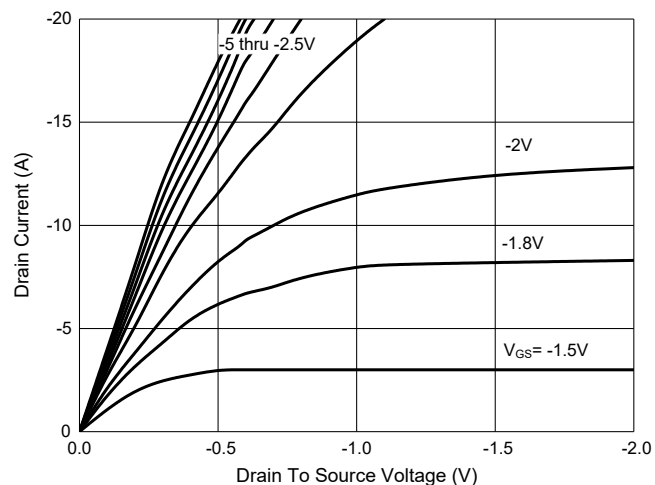


Fig. 2 - Transfer Characteristics

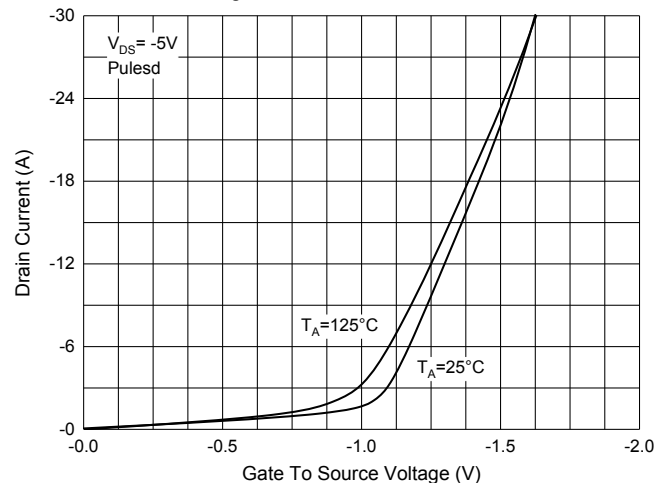


Fig. 3 - $R_{DS(ON)} - I_D$

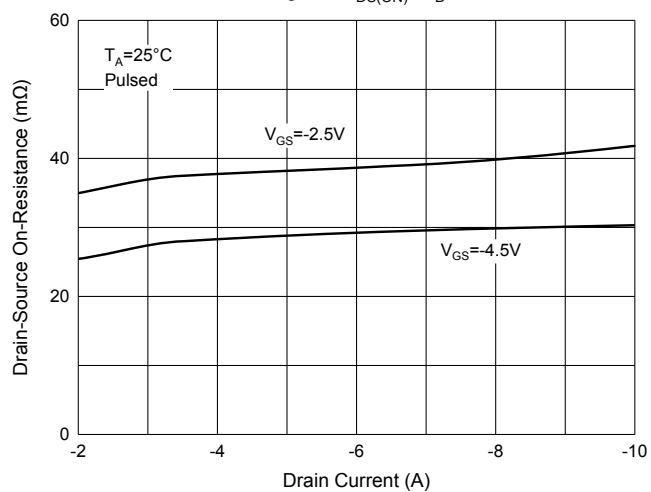


Fig. 4 - Gate Charge

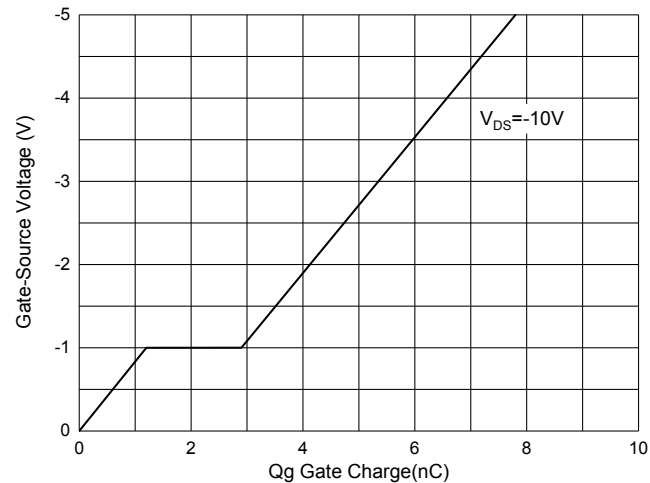


Fig. 5 - $I_S - V_{SD}$

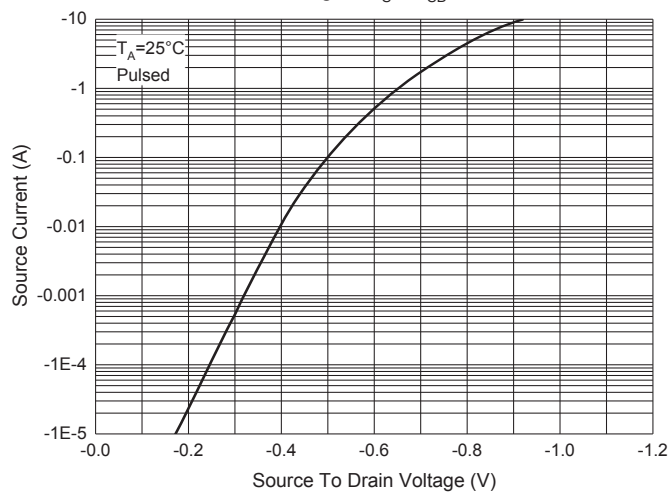
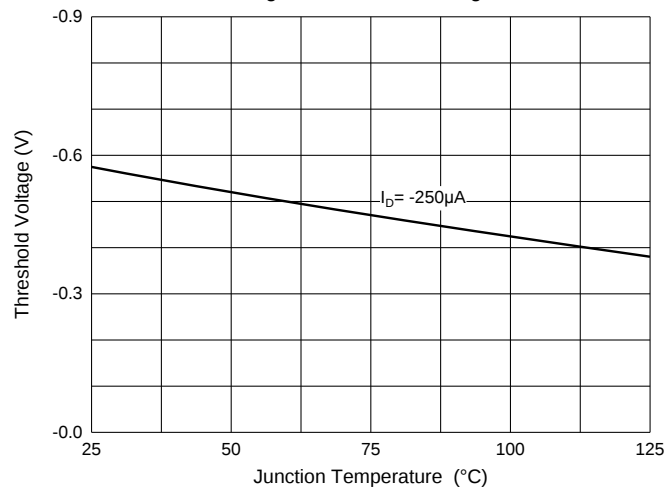


Fig. 6 - Threshold Voltage



Curve Characteristics

Fig. 7 - Safe Operation Area

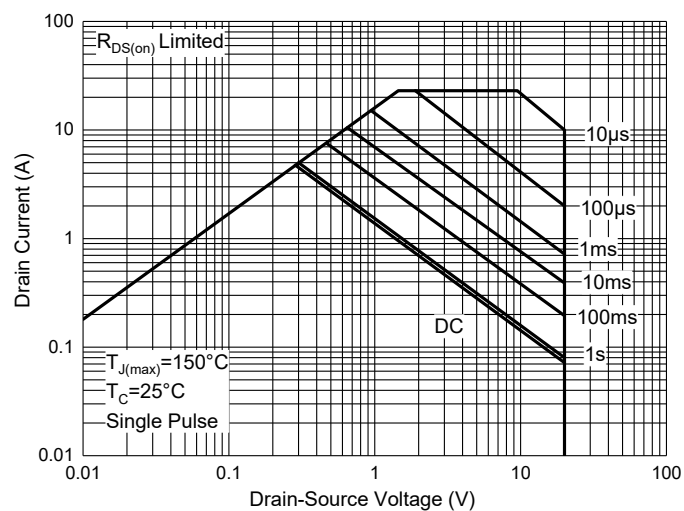
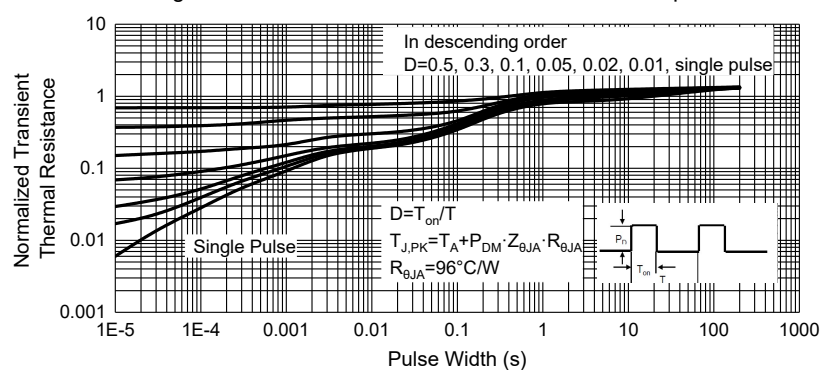


Fig. 8 - Normalized Maximum Transient Thermal Impedance



Ordering Information

Device	Packing
Part Number-TP	Tape&Reel: 3Kpcs/Reel

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