

Features

- Excellent $R_{DS(ON)}$ low gate charge, low gate voltages
- 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)

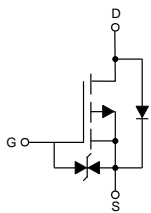
Maximum Ratings

- Operating Junction Temperature Range: -55°C to +150°C
- Storage Temperature: -55°C to +150°C
- Thermal Resistance: 357°C/W Junction to Ambient

Parameter	Symbol	Rating	Unit
Drain-Source Voltage	V_{DS}	-20	V
Gate-Source Voltage	V_{GS}	±8	V
Drain Current-Continuous	I_D	-4.0	A
Power Dissipation	P_D	0.35	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.

Internal Structure

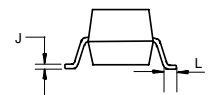
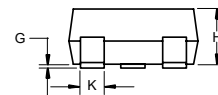
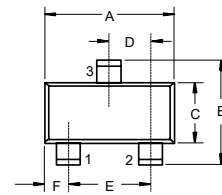


1. GATE
2. SOURCE
3. DRAIN

Marking: 3415

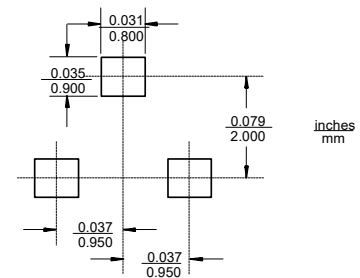
P-Channel MOSFET

SOT-23



DIM	DIMENSIONS				NOTE
	INCHES		MM		
	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 (Ta=25°C unless otherwise specified)

Parameter	Symbol	Test conditions	Min	Typ	Max	Unit
Static Characteristics						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	$V_{GS}=0V, I_D=-250\mu A$	-20			V
Gate-Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=-250\mu A$	-0.3		-1.0	V
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS}=-16V, V_{GS}=0V$			-1	μA
Gate-Body Leakage Current	I_{GSS}	$V_{GS}=\pm 8V, V_{DS}=0V$			± 10	
		$V_{GS}=\pm 4.5V, V_{DS}=0V$			± 1	
Drain-Source On-Resistance ^(Note 2)	$R_{DS(on)}$	$V_{GS}=-4.5V, I_D=-4A$			0.050	Ω
		$V_{GS}=-2.5V, I_D=-4A$			0.060	
		$V_{GS}=-1.8V, I_D=-2A$			0.073	
Forward Transconductance ^(Note 3)	g_{FS}	$V_{DS}=-5V, I_D=-4A$	8			mS
Diode Forward Voltage ^(Note 3)	V_{SD}	$V_{GS}=0V, I_S=-1A$			-1	V
Dynamic Characteristics^(Note 4)						
Input Capacitance	C_{iss}	$V_{DS}=-10V, V_{GS}=0V, f=1MHz$		1450		μF
Output Capacitance	C_{oss}			205		
Reverse Transfer Capacitance	C_{rss}			160		
Gate resistance	R_g	$V_{DS}=0V, V_{GS}=0V, f=1MHz$		6.5		Ω
Switching Characteristics						
Total Gate Charge	Q_g	$V_{DS}=-10V, V_{GS}=-4.5V, I_D=-4A$		1.4	2	nC
Gate-Source Charge	Q_{gs}			0.15	0.25	
Gate-Drain Charge	Q_{gd}			0.2	0.4	
Turn-On Delay Time ^(Note 4)	$t_{d(on)}$	$V_{DD}=-10V, V_{GS}=-4.5V, R_G=30\Omega, R_L=2.5\Omega$		9.5		ns
Turn-On Rise Time ^(Note 4)	t_r			17		
Turn-Off Delay Time ^(Note 4)	$t_{d(off)}$			94		
Turn-Off Fall Time ^(Note 4)	t_f			35		

Note:

2. Repetitive rating, pulse width limited by junction temperature.
3. Pulse Test : Pulse width $\leq 300\mu s$, duty cycle $\leq 2\%$.
4. These parameters have no way to verify.

Curve Characteristics

Fig. 1 - Output Characteristics

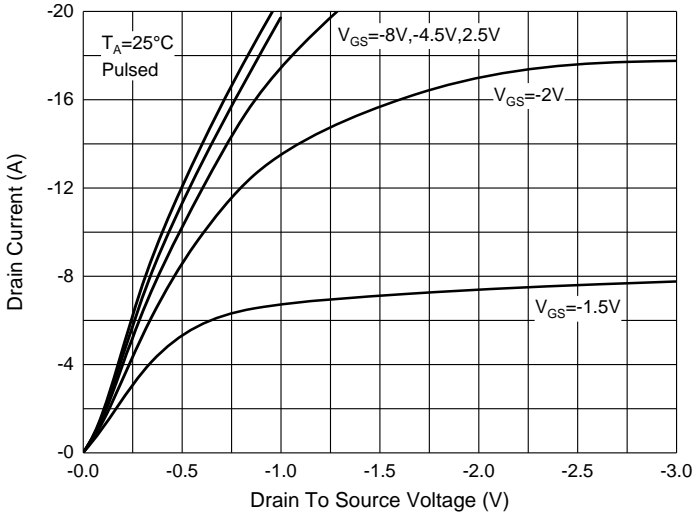


Fig. 2 - Transfer Characteristics

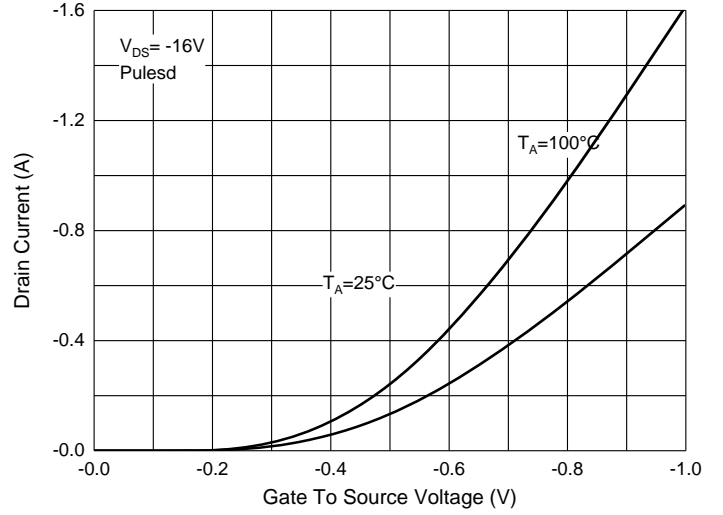


Fig. 3 - $R_{DS(ON)} - I_D$

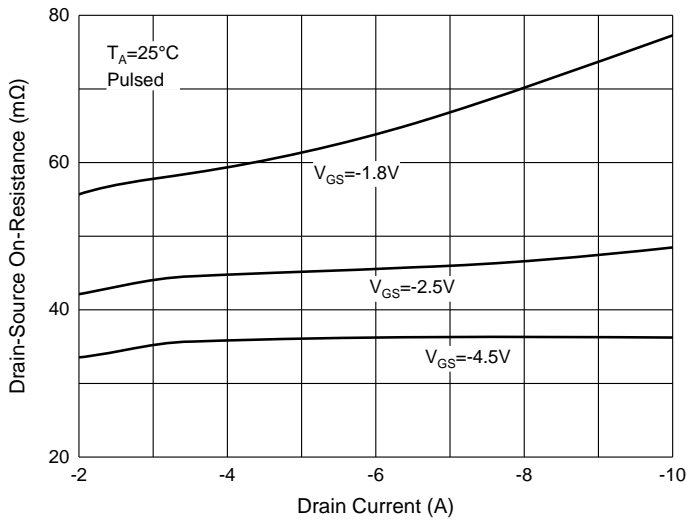


Fig. 4 - $R_{DS(ON)} - V_{GS}$

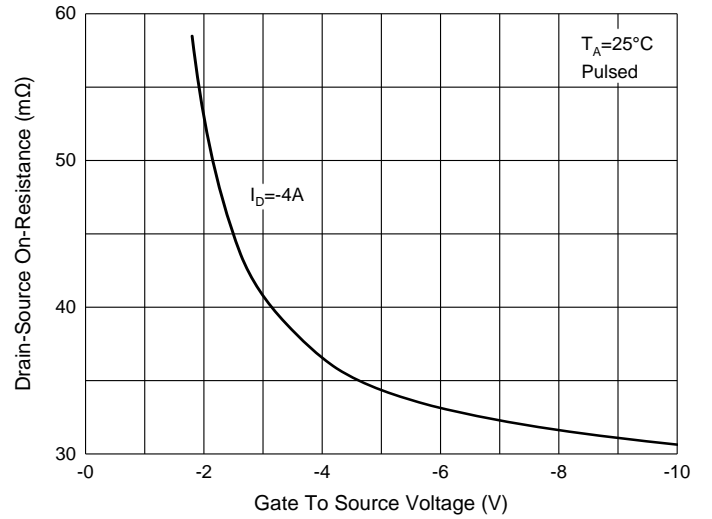


Fig. 5 - $I_S - V_{SD}$

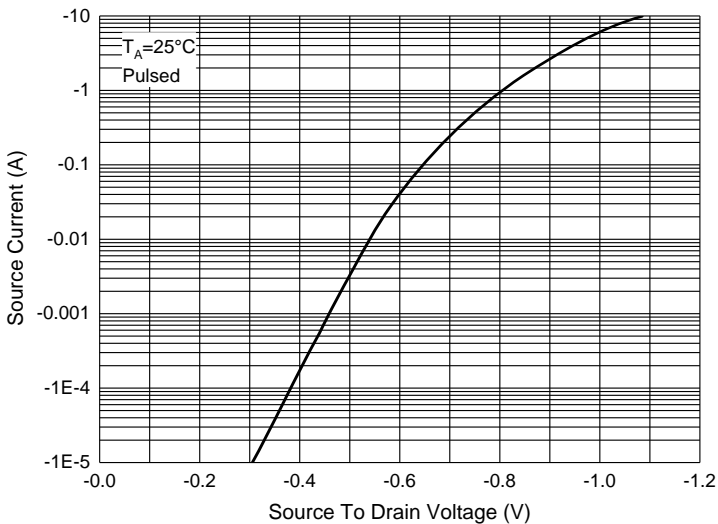
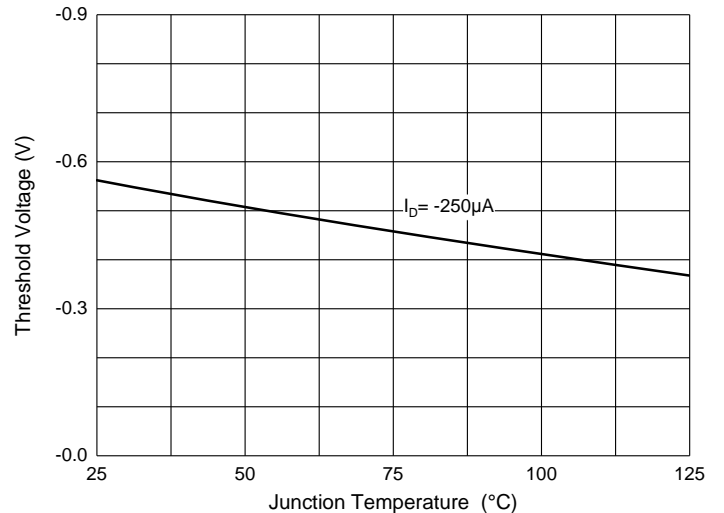


Fig. 6 - Threshold Voltage



Ordering Information

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

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