

Features

- Low $R_{DS(ON)}$
- 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)

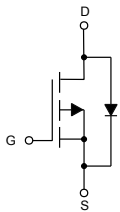
Maximum Ratings

- Operating Junction Temperature Range: -55°C to $+150^{\circ}\text{C}$
- Storage Temperature: -55°C to $+150^{\circ}\text{C}$
- Thermal Resistance: 90°C/W Junction to Ambient^(Note 2)

Parameter	Symbol	Rating	Unit
Drain-Source Voltage	V_{DS}	-20	V
Gate-Source Voltage	V_{GS}	± 10	V
Drain Current-Continuous	I_D	-4.2	A
Drain Current-Pulse ^(Note 2)	I_{DM}	-21	A
Power Dissipation	P_D	1.4	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

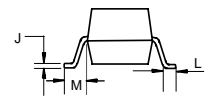
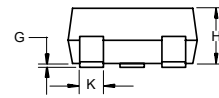
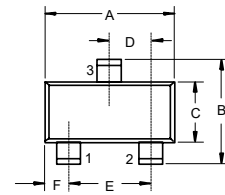


1. GATE
2. SOURCE
3. DRAIN

Marking: S5_B

P-Channel MOSFET

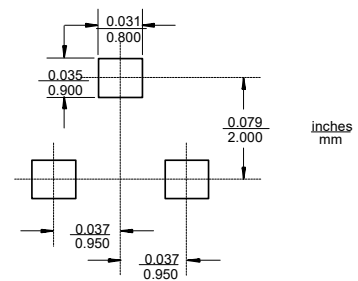
SOT-23



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	
M	0.022 REF		0.55 REF		

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	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=-250\mu A$	-0.5		-0.9	V
Gate-Body Leakage Current	I_{GSS}	$V_{GS}=\pm 10V, V_{DS}=0V$			± 100	nA
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS}=-20V, V_{GS}=0V$			-1	μA
Drain-Source On-Resistance ^(Note 4)	$R_{DS(on)}$	$V_{GS}=-4.5V, I_D=-4A$		30	39	m Ω
		$V_{GS}=-2.5V, I_D=-3A$		38	49	
		$V_{GS}=-1.8V, I_D=-2A$		51	63	
Forward Transconductance ^(Note 4)	g_{FS}	$V_{DS}=-5V, I_D=-4.1A$	6			S
Dynamic Characteristics						
Input Capacitance ^(Note 2,5)	C_{iss}	$V_{DS}=-4V, V_{GS}=0V, f=1MHz$		740		pF
Output Capacitance ^(Note 2,5)	C_{oss}			290		
Reverse Transfer Capacitance ^(Note 2,5)	C_{rss}			190		
Total Gate Charge ^(Note 2)	Q_g	$V_{DS}=-4V, V_{GS}=-4.5V, I_D=-4.1A$		7.8	15	nC
				4.5	9	
Gate-Source Charge ^(Note 2)	Q_{gs}	$V_{DS}=-4V, V_{GS}=-2.5V, I_D=-4.1A$		1.2		
Gate-Drain Charge ^(Note 2)	Q_{gd}			1.6		
Gate Resistance ^(Note 2,5)	R_g	$f=1MHz$	1.4	7	14	Ω
Turn-On Delay Time ^(Note 2,5)	$t_{d(on)}$	$V_{DD}=-4V, V_{GEN}=-4.5V, R_L=1.2\Omega, I_D=-3.3A, R_G=1\Omega$		13	20	ns
Turn-On Rise Time ^(Note 2,5)	t_r			35	53	
Turn-Off Delay Time ^(Note 2,5)	$t_{d(off)}$			32	48	
Turn-Off Fall Time ^(Note 2,5)	t_f			10	20	
Turn-On Delay Time ^(Note 2,5)	$t_{d(on)}$	$V_{DD}=-4V, V_{GEN}=-8V, R_L=1.2\Omega, I_D=-3.3A, R_G=1\Omega$		5	10	ns
Turn-On Rise Time ^(Note 2,5)	t_r			11	17	
Turn-Off Delay Time ^(Note 2,5)	$t_{d(off)}$			22	33	
Turn-Off Fall Time ^(Note 2,5)	t_f			16	24	
Drain-Source Body Diode Characteristics						
Continuous Source-Drain Diode Current	I_S	$T_C=25^\circ C$			-4.2	A
Pulse Diode Forward Current ^(Note 4)	I_{SM}				-10	
Body Diode Voltage	V_{SD}	$I_F=-3.3A$		-0.8	-1.2	V

Note:

2. Guaranteed by Design, Not Subject to Production Testing.
3. Repetitive Rating: Pulse Width Limited by Max. Junction Temperature.
4. Pulse Test: Pulse Width $\leq 300\mu s$, Duty Cycle $\leq 2\%$.
5. These Parameters Have No Way to Verify.

Curve Characteristics

Fig. 1 - On-Resistance Characteristics

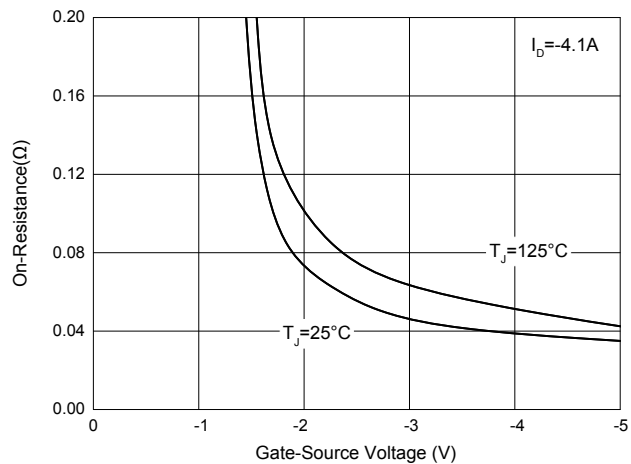


Fig. 2 - Drain Current Characteristics

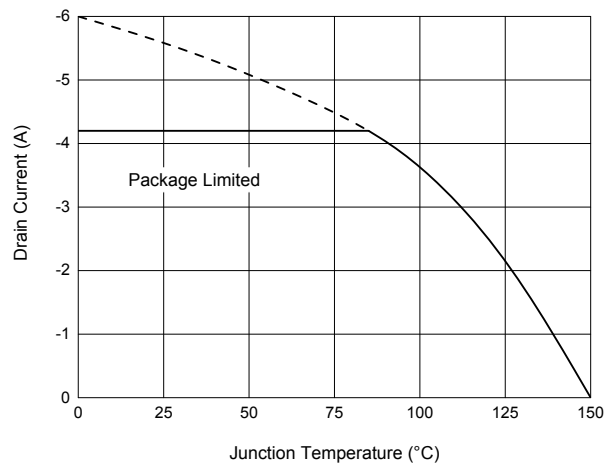


Fig. 3 - Output Characteristics

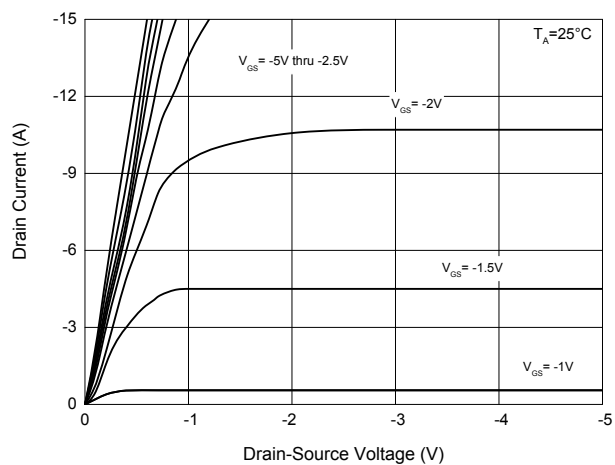


Fig. 4 - On-Resistance Characteristics

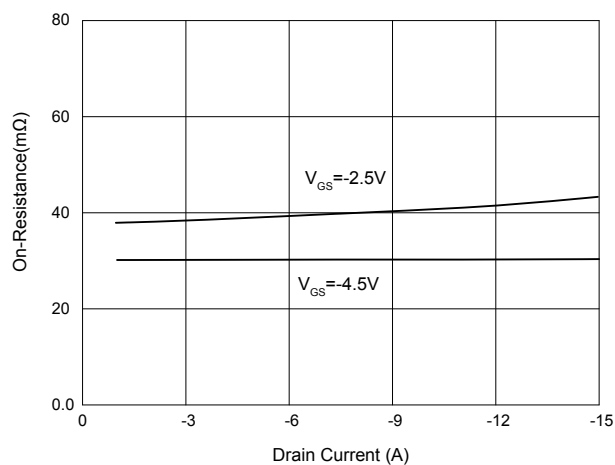
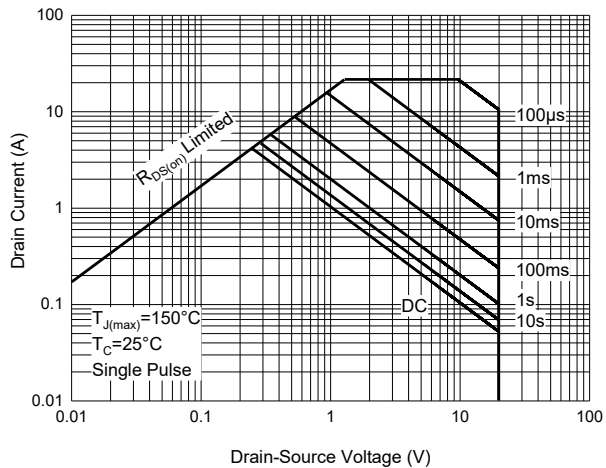


Fig. 5 - Safe Operation Area



Ordering Information

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

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