

## Features

- Trench MOSFET Technology
- ESD Protected Up To 2KV (HBM)
- Moisture Sensitivity Level 1
- Halogen Free. "Green" Device (Note 1)
- Epoxy Meets UL 94 V-0 Flammability Rating
- Lead Free Finish/RoHS Compliant ("P" Suffix Designates RoHS Compliant. See Ordering Information)

## Maximum Ratings

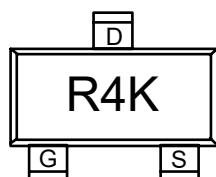
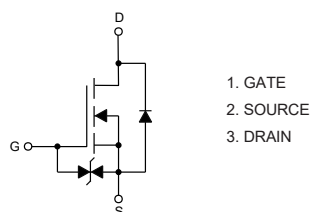
- Operating Junction Temperature Range: -55°C to +150°C
- Storage Temperature Range: -55°C to +150°C
- Thermal Resistance: 125°C/W Junction to Ambient (Note 2)

Thermal Resistance: 125 °C/W Junction to Ambient				
Parameter		Symbol	Rating	Unit
Drain -source Voltage		V <sub>DS</sub>	30	V
Gate -Source Voltage		V <sub>GS</sub>	±12	V
Drain Current-Continuous	T <sub>A</sub> =25°C	I <sub>D</sub>	5.8	A
	T <sub>A</sub> =100°C		3.6	
Pulsed Drain Current <sup>(Note 3)</sup>		I <sub>DM</sub>	23.2	A
Power Dissipation <sup>(Note 4)</sup>		P <sub>D</sub>	1	W

Note:

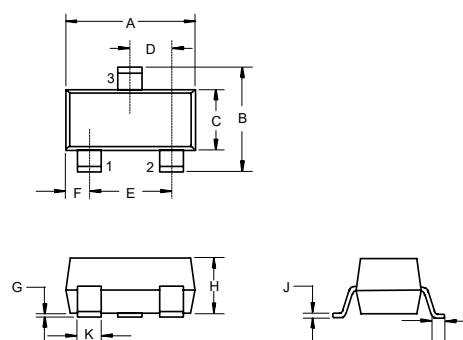
1. Halogen free "Green" products are defined as those which contain <900ppm bromine, <900ppm chlorine (<1500ppm total Br + Cl) and <1000ppm antimony compounds.
2. The value of  $R_{\theta JA}$  is measured with the device mounted on 1in<sup>2</sup> FR-4 board with 2oz. Copper, in a still air environment with  $T_A=25^\circ\text{C}$ .
3. Repetitive rating; pulse width limited by max. junction temperature.
4.  $P_D$  is based on max. junction temperature, using junction-ambient thermal resistance.

## Internal Structure and Marking Code



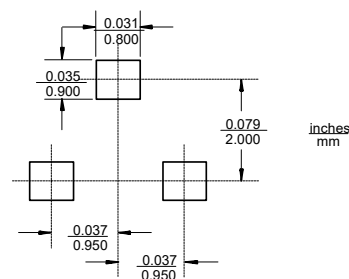
## N-Channel MOSFET

## SOT-23



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

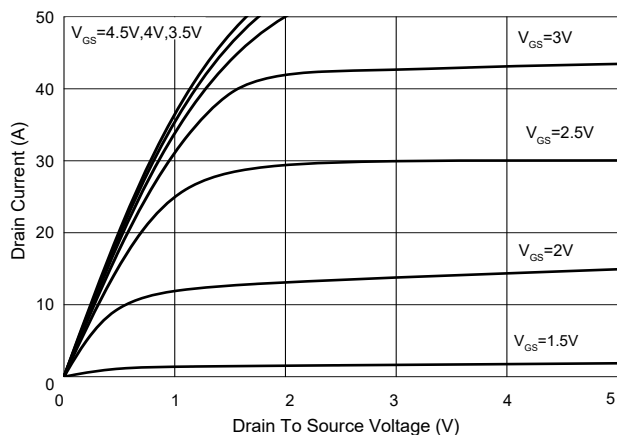


# Electrical Characteristics @ 25°C (Unless Otherwise Specified)

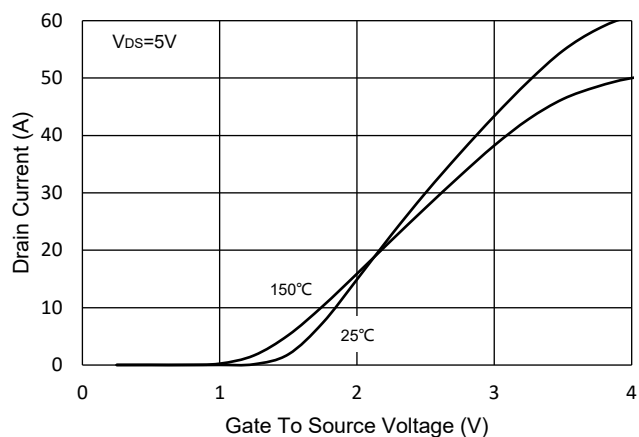
Parameter	Symbol	Test conditions	Min	Typ	Max	Unit
Static Characteristics						
Drain-Source Breakdown Voltage	V <sub>(BR)DSS</sub>	V <sub>GS</sub> =0V, I <sub>D</sub> =250μA	30			V
Gate-Body Leakage Current	I <sub>GSS</sub>	V <sub>GS</sub> =±12V, V <sub>DS</sub> =0V			±10	μA
Zero Gate Voltage Drain Current	I <sub>DSS</sub>	V <sub>DS</sub> =24V, V <sub>GS</sub> =0V			1	μA
Gate-Threshold Voltage	V <sub>GS(th)</sub>	V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> =250μA	0.5	0.9	1.4	V
Drain-Source On-Resistance	R <sub>DS(on)</sub>	V <sub>GS</sub> =4.5V, I <sub>D</sub> =5A		26	40	mΩ
		V <sub>GS</sub> =2.5V, I <sub>D</sub> =3A		30	50	
Forward Transconductance	g <sub>FS</sub>	V <sub>DS</sub> =3V, I <sub>D</sub> =1A		8		S
Gate Resistance	R <sub>g</sub>	f=1 MHz, Open drain		3		Ω
Diode Characteristics						
Continuous Body Diode Current	I <sub>S</sub>				5.8	A
Diode Forward Voltage	V <sub>SD</sub>	V <sub>GS</sub> =0V, I <sub>S</sub> =5A			1.3	V
Reverse Recovery Time	t <sub>rr</sub>	I <sub>F</sub> =3A, dI <sub>F</sub> /dt=100A/μs		10		ns
Reverse Recovery Charge	Q <sub>rr</sub>			5		nC
Dynamic Characteristics						
Input Capacitance	C <sub>iss</sub>	V <sub>DS</sub> =15V, V <sub>GS</sub> =0V, f=1MHz		576		pF
Output Capacitance	C <sub>oss</sub>			61		
Reverse Transfer Capacitance	C <sub>rss</sub>			43		
Total Gate Charge	Q <sub>g</sub>	V <sub>DS</sub> =15V, V <sub>GS</sub> =4.5V, I <sub>D</sub> =3A		6.1		nC
Gate-Source Charge	Q <sub>gs</sub>			1.4		
Gate-Drain Charge	Q <sub>gd</sub>			1.4		
Turn-On Delay Time	t <sub>d(on)</sub>	V <sub>DD</sub> =15V, V <sub>GS</sub> =4.5V, R <sub>G</sub> =2.7Ω, I <sub>D</sub> =3A		10		ns
Turn-On Rise Time	t <sub>r</sub>			24		
Turn-Off Delay Time	t <sub>d(off)</sub>			120		
Turn-Off Fall Time	t <sub>f</sub>			6		

## Curve Characteristics

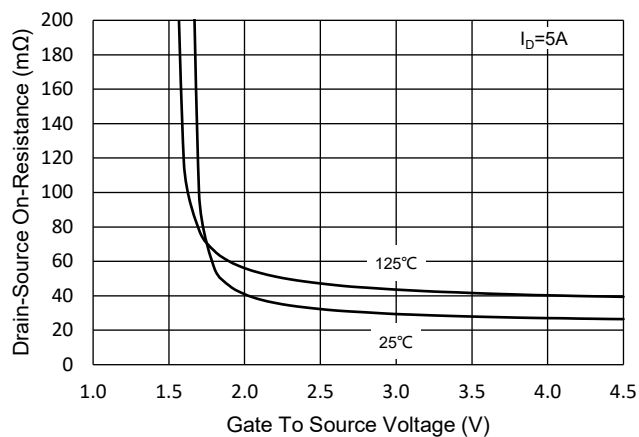
**Fig. 1 - Typical Output Characteristics**



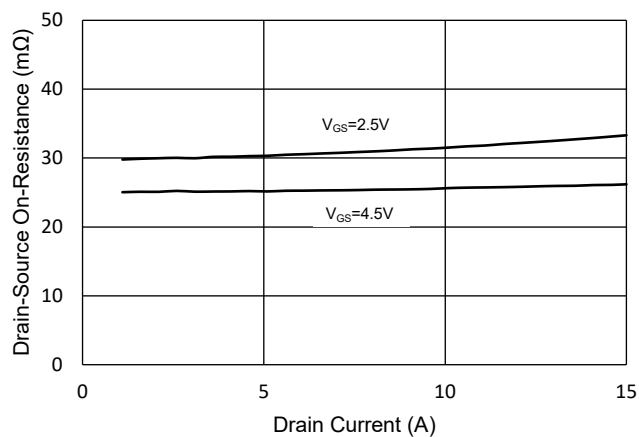
**Fig.2 - Transfer Characteristic**



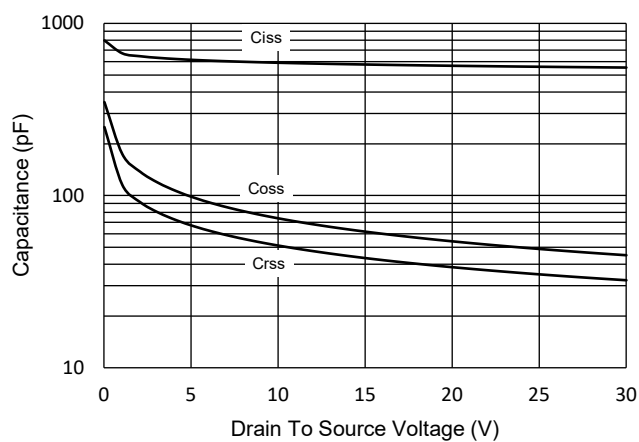
**Fig.3 -  $R_{DS(ON)}$  -  $V_{GS}$**



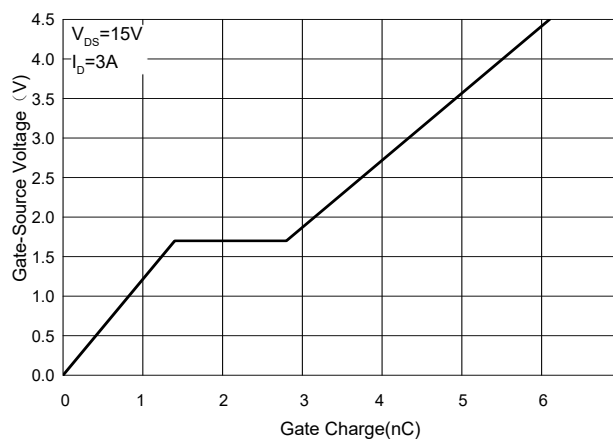
**Fig.4 -  $R_{DS(ON)}$  -  $I_D$**



**Fig.5 - Capacitance Characteristics**

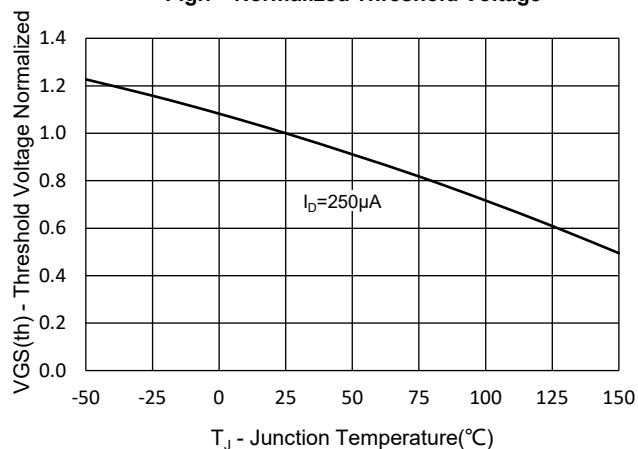


**Fig. 6 - Gate Charge**

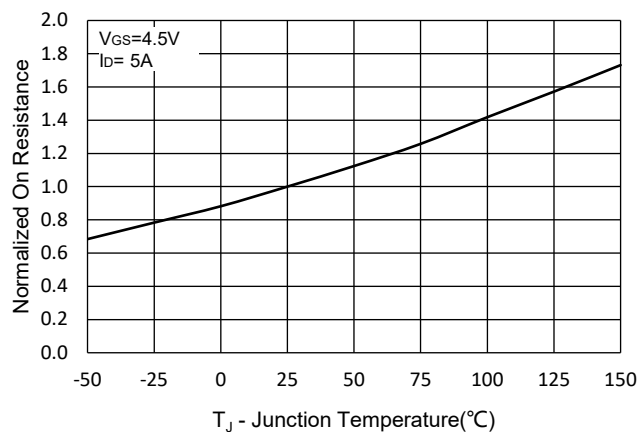


## Curve Characteristics

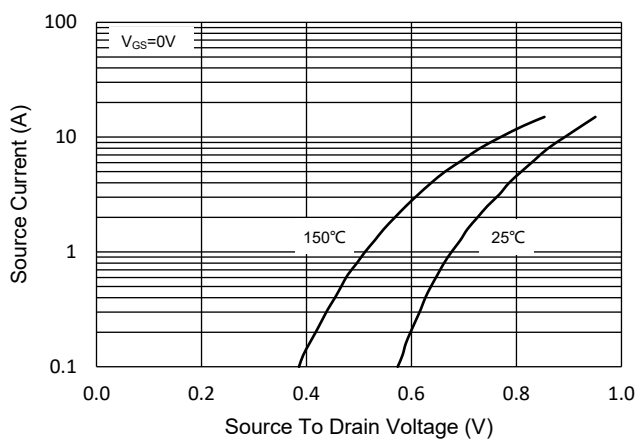
**Fig.7 - Normalized Threshold Voltage**



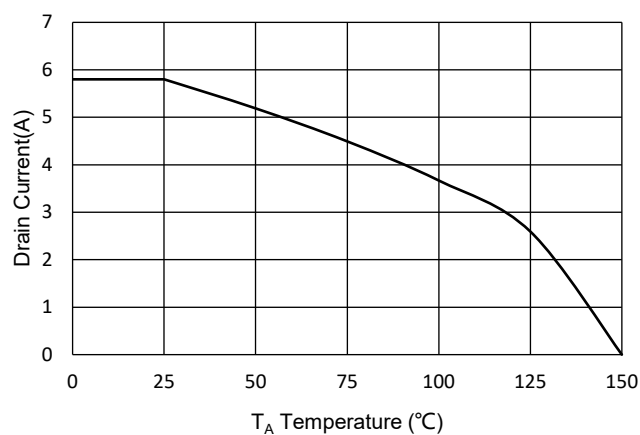
**Fig.8 - Normalized On Resistance Characteristics**



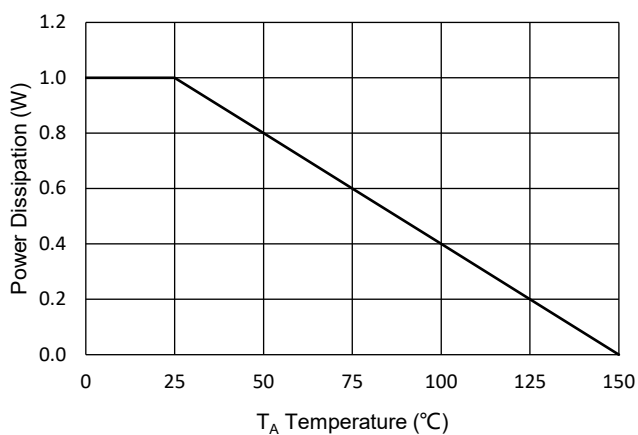
**Fig.9 -  $I_S - V_{SD}$**



**Fig.10 - Drain Current**

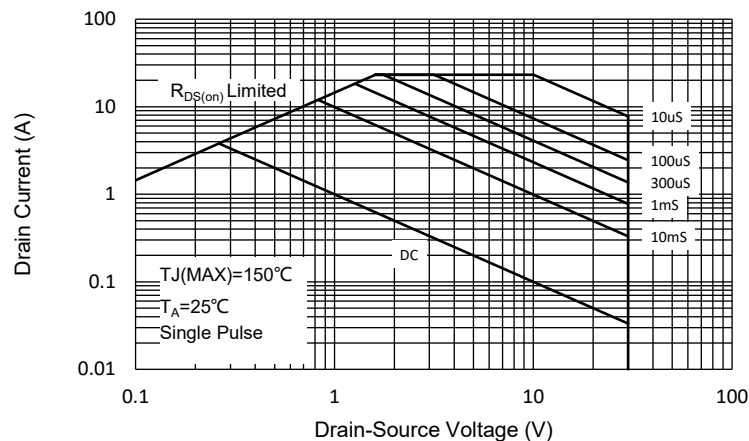


**Fig.11 - PD Dissipation**

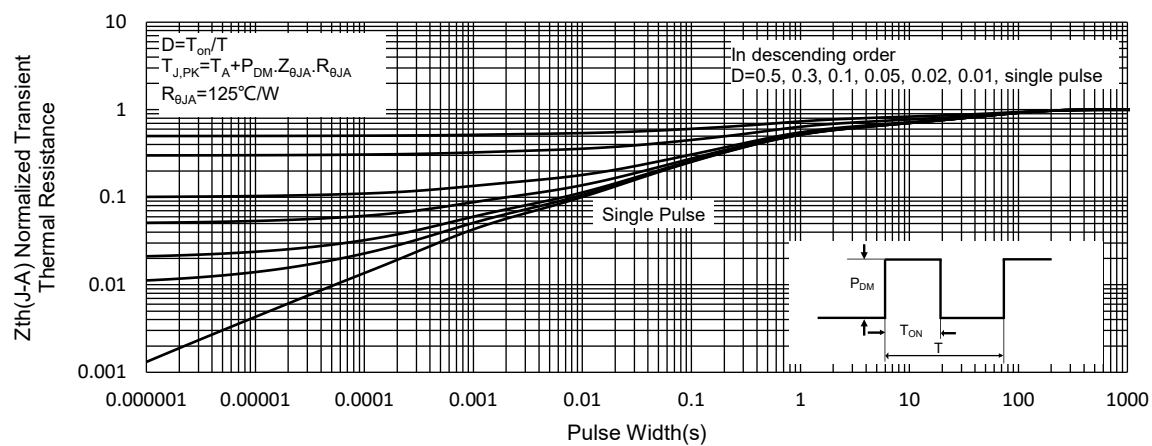


## Curve Characteristics

**Fig.12 - Safe Operation Area**



**Fig.13 - Normalized Transient Thermal Impedance**



## Ordering Information

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

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