

## Features

- ESD Protected Up To 2KV (HBM)
- Trench LV MOSFET Technology
- 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)

## N-Channel MOSFET

## Maximum Ratings

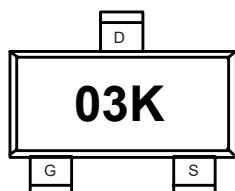
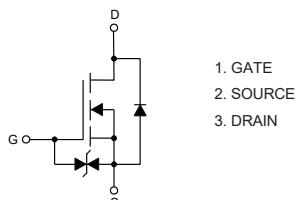
- Operating Junction Temperature Range: -55°C to +150°C
- Storage Temperature Range: -55°C to +150°C
- Thermal Resistance: 125°C/W Junction to Ambient<sup>(Note2)</sup>

Parameter	Symbol	Rating	Unit
Drain-Source Voltage	V <sub>DS</sub>	30	V
Gate-Source Voltage	V <sub>GS</sub>	±12	V
Continuous Drain Current <small>T<sub>A</sub>=25°C</small>	I <sub>D</sub>	0.8	A
		0.51	
Pulsed Drain Current <sup>(Note 3)</sup>	I <sub>DM</sub>	3.2	A
Total Power Dissipation <sup>(Note 4)</sup>	P <sub>D</sub>	1	W

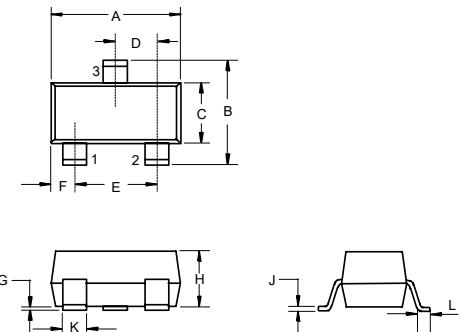
Note:

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<sub>θJA</sub> is measured with the device mounted on the minimum recommended pad size, in a still air environment with T<sub>A</sub> = 25°C.
3. Repetitive rating; pulse width limited by max. junction temperature.
4. P<sub>D</sub> is based on max. junction temperature, using junction-ambient thermal resistance.

## Internal Structure and Marking Code

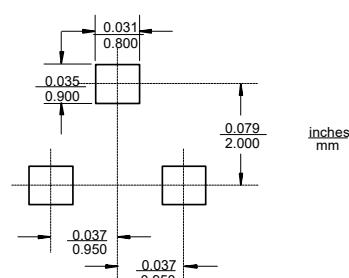


## SOT-23



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
<b>Static Characteristics</b>						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	$V_{GS}=0V, I_D=250\mu A$	30			V
Gate-Source Leakage Current	$I_{GSS}$	$V_{DS}=0V, V_{GS}=\pm 12V$			$\pm 10$	$\mu A$
Zero Gate Voltage Drain Current	$I_{DSS}$	$V_{DS}=24V, V_{GS}=0V$			1	$\mu A$
Gate-Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=250\mu A$	0.6	1.0	1.3	V
Drain-Source On-Resistance	$R_{DS(on)}$	$V_{GS}=4.5V, I_D=0.5A$		340	510	$m\Omega$
		$V_{GS}=2.5V, I_D=0.3A$		435	660	
Forward Transconductance	$g_{FS}$	$V_{DS}=5V, I_D=0.8A$		1.8		S
Gate Resistance	$R_g$	f=1 MHz, Open drain		197		$\Omega$
<b>Diode Characteristics</b>						
Continuous Body Diode Current	$I_S$				0.8	A
Diode Forward Voltage	$V_{SD}$	$V_{GS}=0V, I_S=0.5A$			1.2	V
Reverse Recovery Time	$t_{rr}$	$I_F=0.5A, di/dt=100A/\mu s$		5.9		ns
Reverse Recovery Charge	$Q_{rr}$			2		nC
<b>Dynamic Characteristics</b>						
Input Capacitance	$C_{iss}$	$V_{DS}=15V, V_{GS}=0V, f=1MHz$		34.6		$pF$
Output Capacitance	$C_{oss}$			6.2		
Reverse Transfer Capacitance	$C_{rss}$			3.9		
Total Gate Charge	$Q_g$	$V_{DS}=15V, V_{GS}=4.5V, I_D=0.5A$		0.64		$nC$
Gate-Source Charge	$Q_{gs}$			0.09		
Gate-Drain Charge	$Q_{gd}$			0.17		
Turn-On Delay Time	$t_{d(on)}$	$V_{DD}=15V, V_{GS}=4.5V, R_G=3\Omega, I_D=0.5A$		8.2		$ns$
Turn-On Rise Time	$t_r$			23.3		
Turn-Off Delay Time	$t_{d(off)}$			34.2		
Turn-Off Fall Time	$t_f$			31.5		

## Curve Characteristics

Fig.1 - Typical Output Characteristics

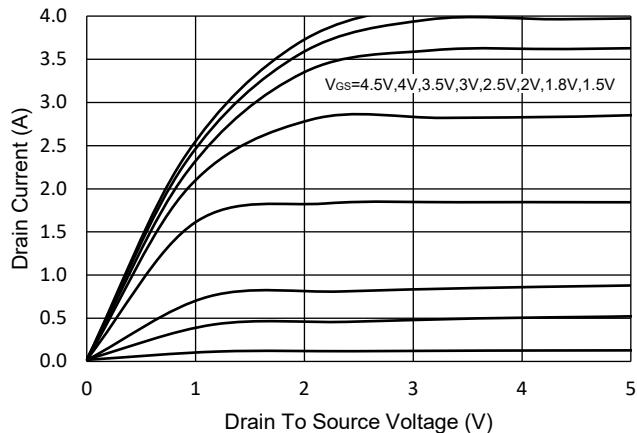


Fig.2 - Transfer Characteristic

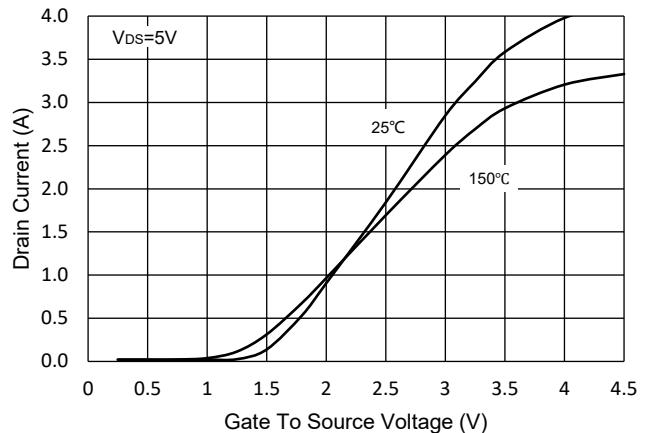


Fig.3 -  $R_{DS(ON)}$  -  $V_{GS}$

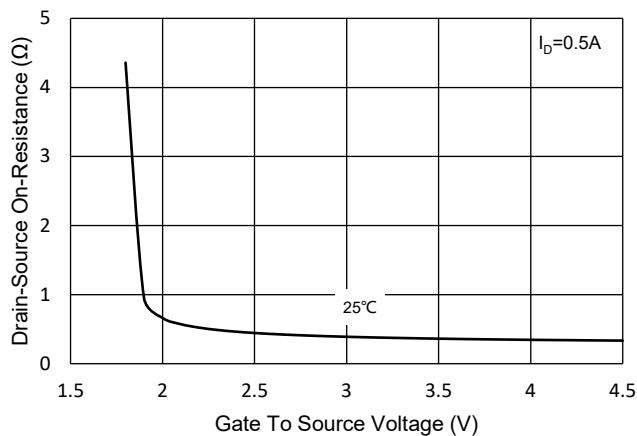


Fig.4 -  $R_{DS(ON)}$  -  $I_D$

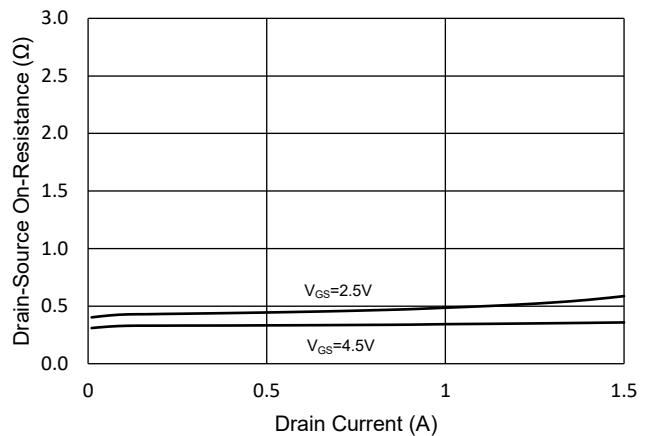


Fig.5 - Capacitance Characteristics

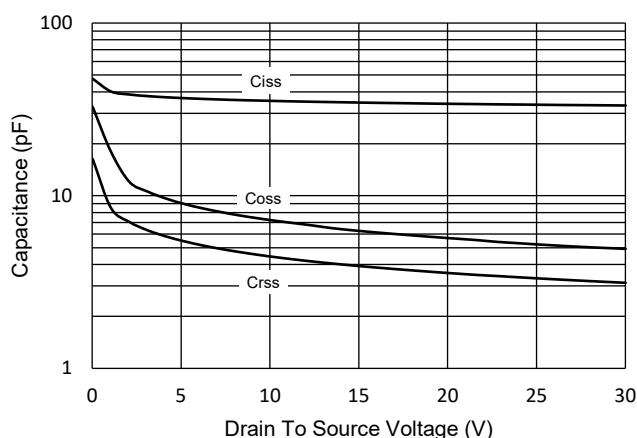
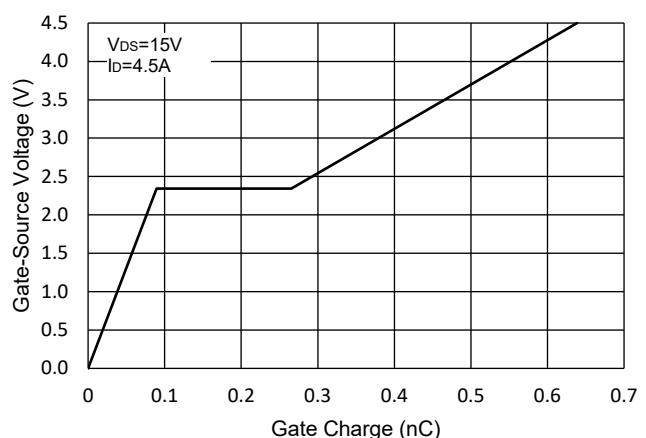


Fig.6 - Gate Charge



## Curve Characteristics

Fig.7 - Normalized Threshold Voltage

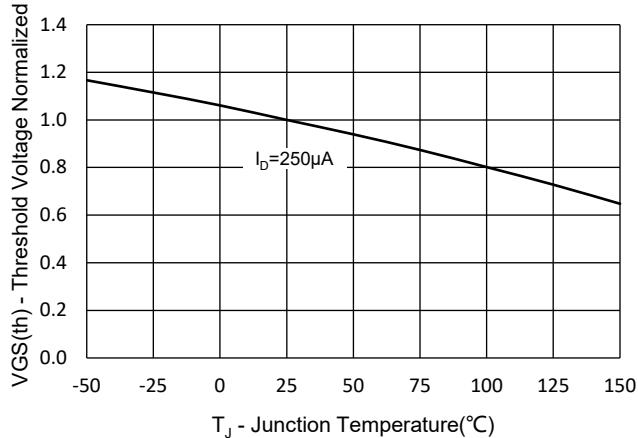


Fig.8 - Normalized On Resistance Characteristics

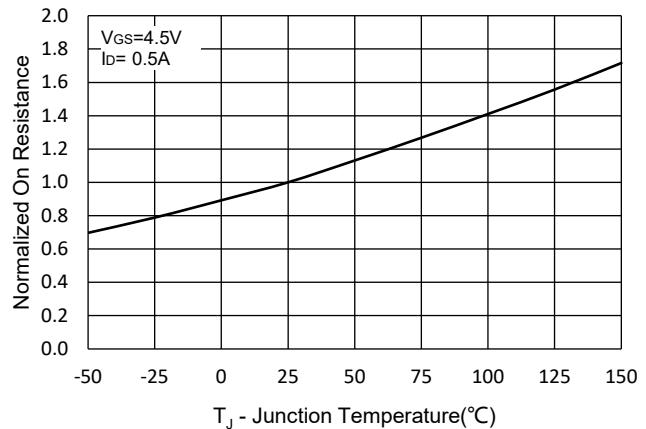


Fig.9 - I<sub>S</sub> - V<sub>SD</sub>

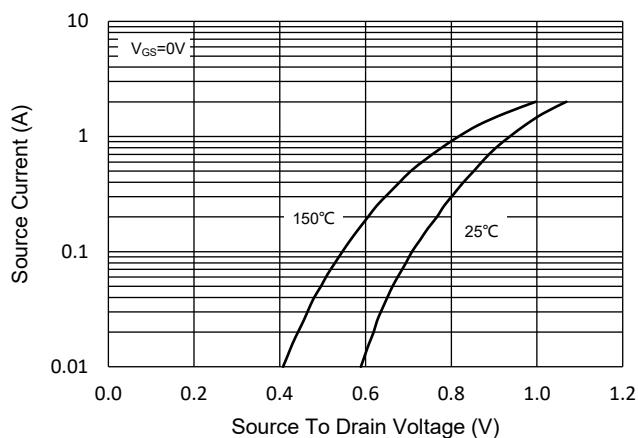


Fig.10 - Drain Current

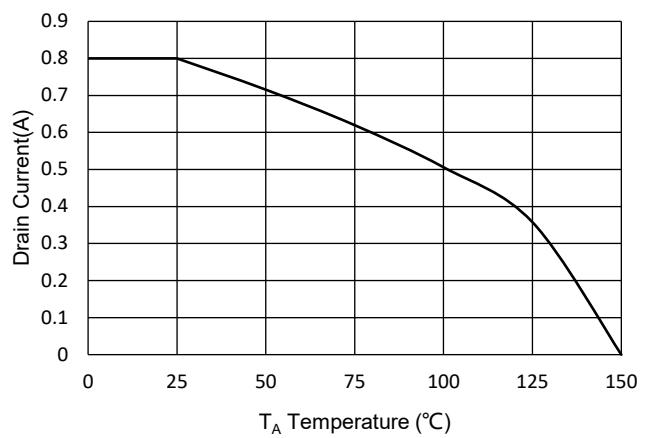
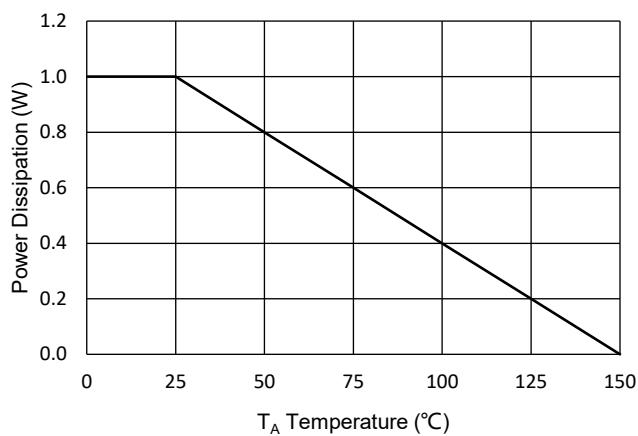


Fig.11 - PD Dissipation



## Curve Characteristics

Fig.12 - Safe Operation Area

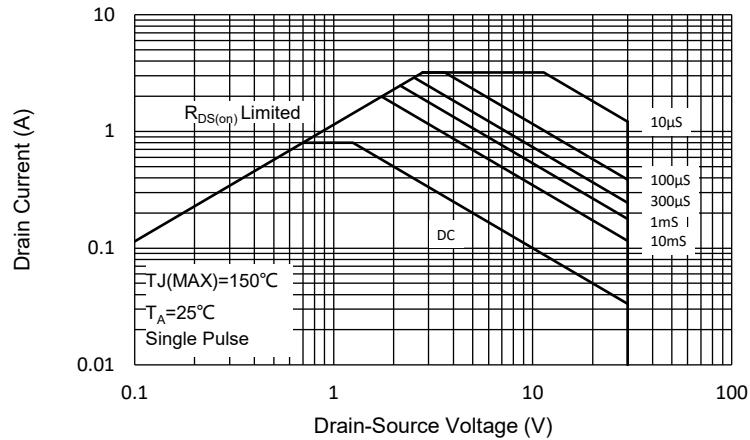
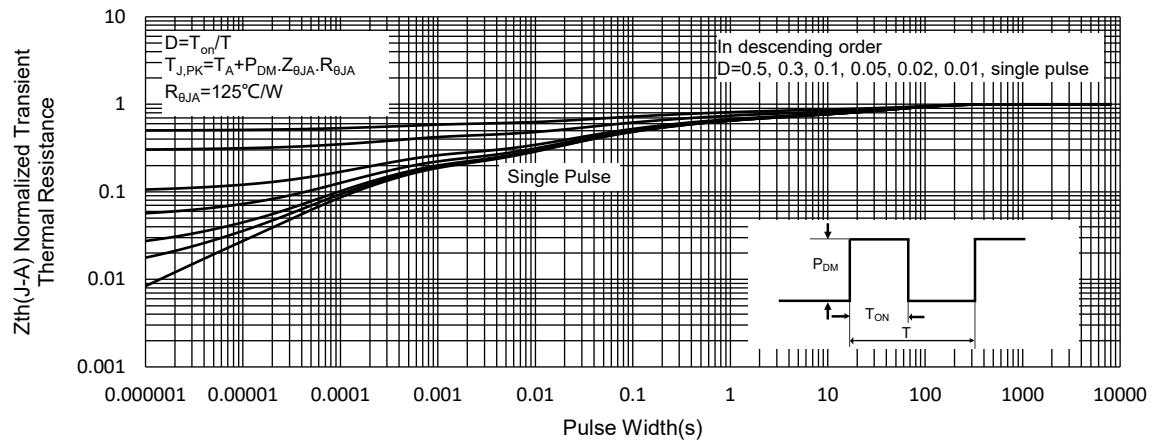


Fig.13 - Normalized Transient Thermal Impedance



## Ordering Information

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

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