

**Features**

- Split Gate Trench MOSFET Technology
- Moisture Sensitivity Level 3
- 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**

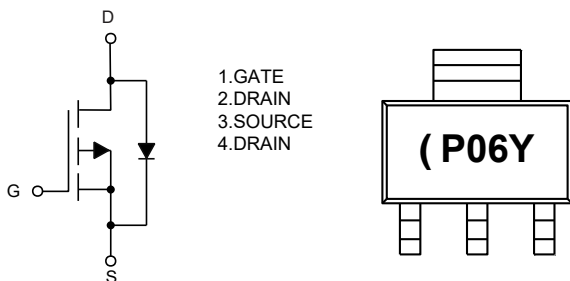
- Operating Junction Temperature Range : -55°C to +150°C
- Storage Temperature Range: -55°C to +150°C
- Thermal Resistance: 62.5°C/W Junction to Ambient(Notes2)

Parameter		Symbol	Rating	Unit
Drain-Source Voltage		$V_{DS}$	-60	V
Gate-Source Voltage		$V_{GS}$	±20	V
Continuous Drain Current	$T_C=25^\circ C$	$I_D$	-4	A
	$T_C=100^\circ C$		-2.5	
Pulsed Drain Current (Note3)		$I_{DM}$	-16	A
Total Power Dissipation (Note4)		$P_D$	2	W
Single Pulsed Avalanche Energy (Note5)		$E_{AS}$	24	mJ

Note:

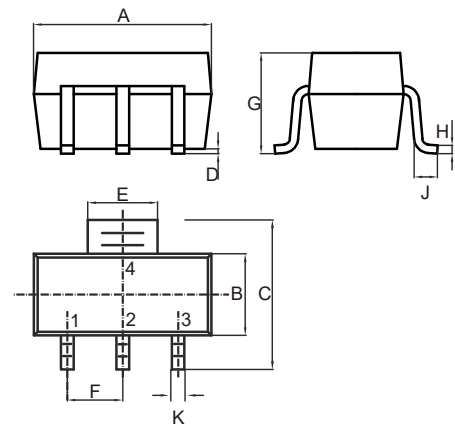
1. Halogen free "Green" products are defined as those which contain <900ppm bromine, <900ppm chlorine (<1500ppm total Br + Cl) and <1000ppm antimony compounds.
2. The value of  $R_{\theta JA}$  is measured with the device mounted on 1in<sup>2</sup> FR-4 board with 2oz. Copper, in a still air environment with  $T_A = 25^\circ C$ .
3. Repetitive rating; pulse width limited by max. junction temperature.
4.  $P_D$  is based on max. junction temperature, using junction-ambient thermal resistance.
5.  $T_J=25^\circ C$ ,  $V_{DD}=-25V$ ,  $V_{GS}=-10V$ ,  $R_g=25\Omega$ ,  $L=0.5mH$ .

**Internal Structure and Marking Code**



**P-Channel MOSFET**

**SOT-223**



DIM	INCHES		MM		NOTE
	MIN	MAX	MIN	MAX	
A	0.248	0.264	6.30	6.70	
B	0.130	0.146	3.30	3.70	
C	0.264	0.287	6.70	7.30	
D	0.001	0.004	0.02	0.10	
E	0.114	0.122	2.90	3.10	
F	0.091		2.30		TYP.
G	---	0.071	---	1.80	
H	0.009	0.014	0.23	0.35	
J	0.030	---	0.75	---	
K	0.026	0.033	0.66	0.84	

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

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
<b>Static Characteristics</b>						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	$V_{GS}=0V, I_D=-250\mu A$	-60			V
Gate-Source Leakage Current	$I_{GSS}$	$V_{DS}=0V, V_{GS}=\pm 20V$			$\pm 100$	nA
Zero Gate Voltage Drain Current	$I_{DSS}$	$V_{DS}=-60V, V_{GS}=0V$			-1	$\mu A$
Gate-Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=-250\mu A$	-1	-1.8	-2.5	V
Drain-Source On-Resistance	$R_{DS(on)}$	$V_{GS}=-10V, I_D=-4A$		68	85	m $\Omega$
		$V_{GS}=-4.5V, I_D=-2A$		90	120	
Gate Resistance	$R_g$	f=1 MHz, Open drain		3		$\Omega$
<b>Diode Characteristics</b>						
Continuous Body Diode Current	$I_S$				-4	A
Diode Forward Voltage	$V_{SD}$	$V_{GS}=0V, I_S=-1A$			-1.2	V
Reverse Recovery Time	$t_{rr}$	$I_F=-4A, dI_F/dt=100A/\mu s$		20		ns
Reverse Recovery Charge	$Q_{rr}$			15		nC
<b>Dynamic Characteristics</b>						
Input Capacitance	$C_{iss}$	$V_{DS}=-15V, V_{GS}=0V, f=1MHz$		505		pF
Output Capacitance	$C_{oss}$			133		
Reverse Transfer Capacitance	$C_{rss}$			23		
Total Gate Charge	$Q_g$	$V_{DS}=-30V, V_{GS}=-10V, I_D=-3.1A$		9.6		nC
Gate-Source Charge	$Q_{gs}$			2.39		
Gate-Drain Charge	$Q_{gd}$			1.1		
Turn-On Delay Time	$t_{d(on)}$	$V_{DD}=-30V, V_{GS}=-4.5V, R_G=1\Omega, I_D=-2.4A$		11		ns
Turn-On Rise Time	$t_r$			33.8		
Turn-Off Delay Time	$t_{d(off)}$			12.4		
Turn-Off Fall Time	$t_f$			23.2		

**Curve Characteristics**

Fig. 1 - Typical Output Characteristics

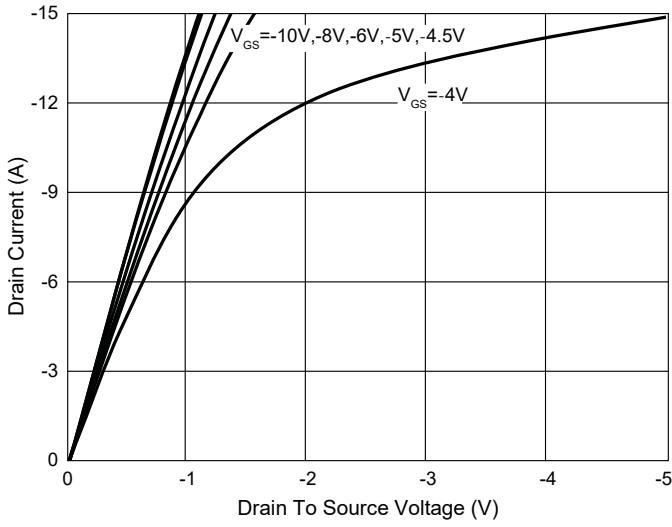


Fig. 2 - Transfer Characteristics

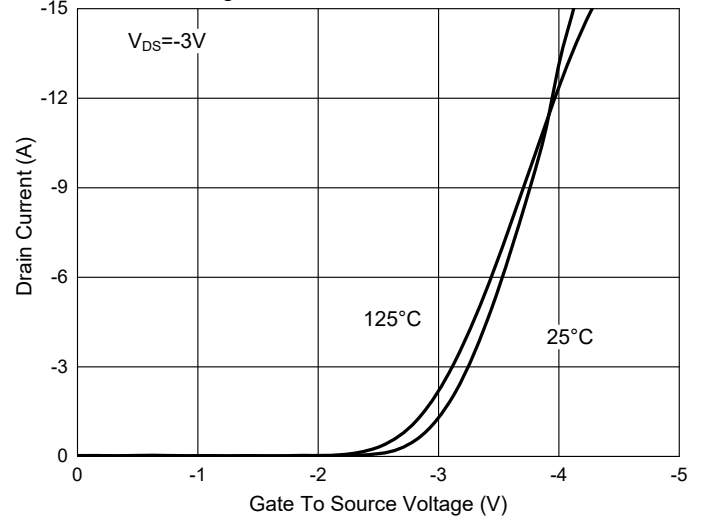


Fig. 3 -  $R_{DS(ON)} - V_{GS}$

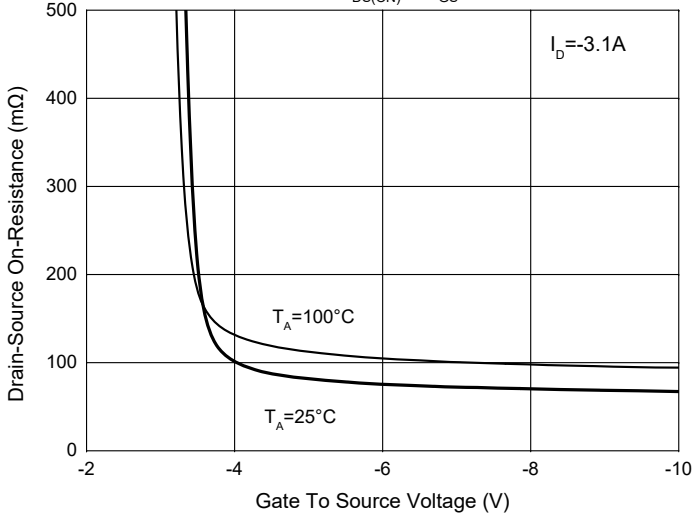


Fig. 4 -  $R_{DS(ON)} - I_D$

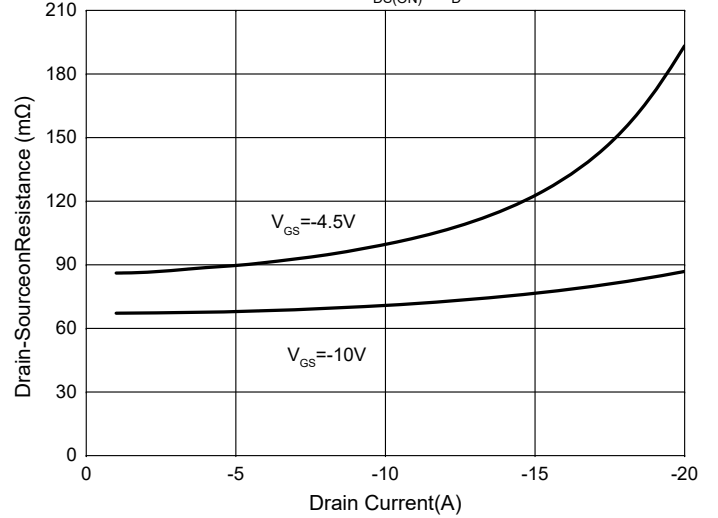


Fig. 5 - Capacitance Characteristics

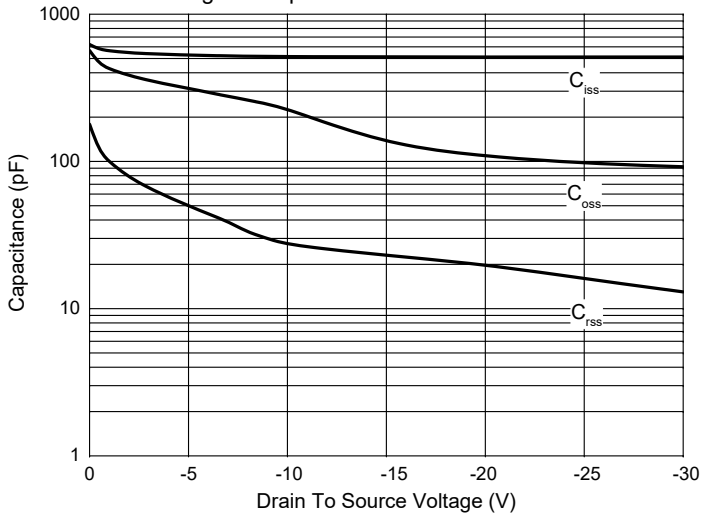
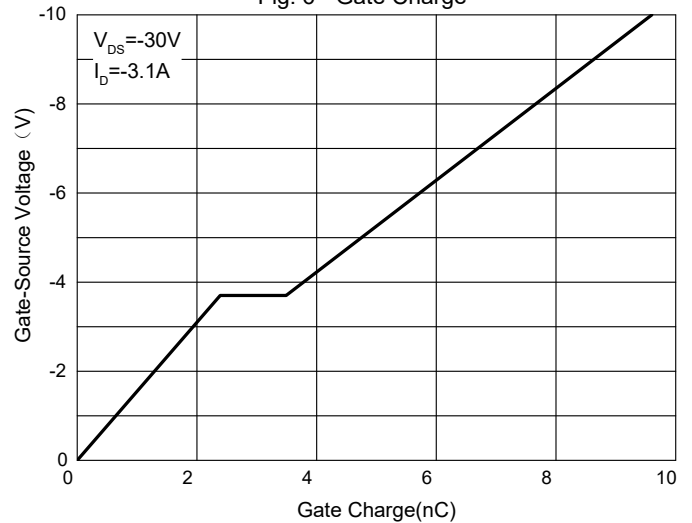


Fig. 6 - Gate Charge



**Curve Characteristics**

Fig. 7 - Normalized Threshold Voltage

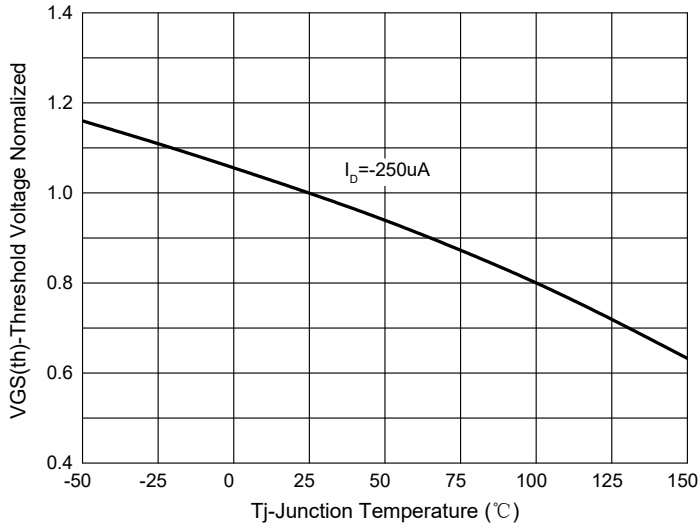


Fig. 8 - Normalized On Resistance Characteristics

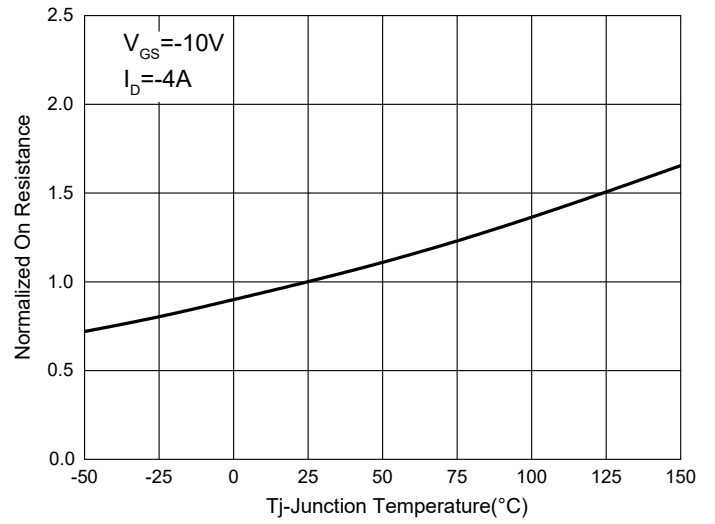


Fig. 10 -  $I_S - V_{SD}$

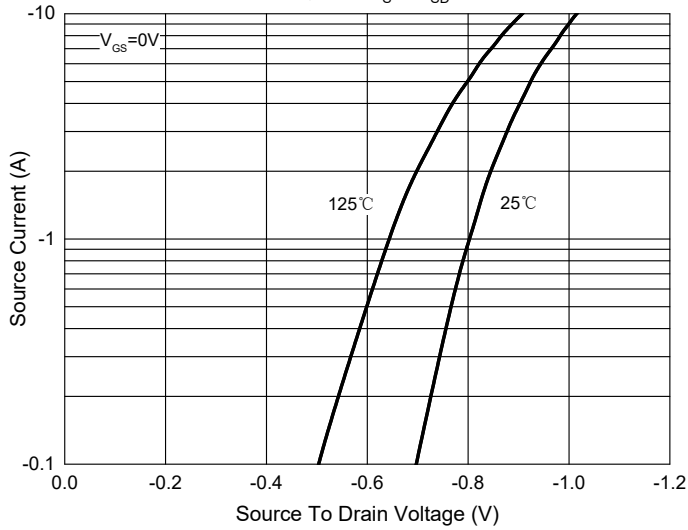


Fig. 10 - Drain Current

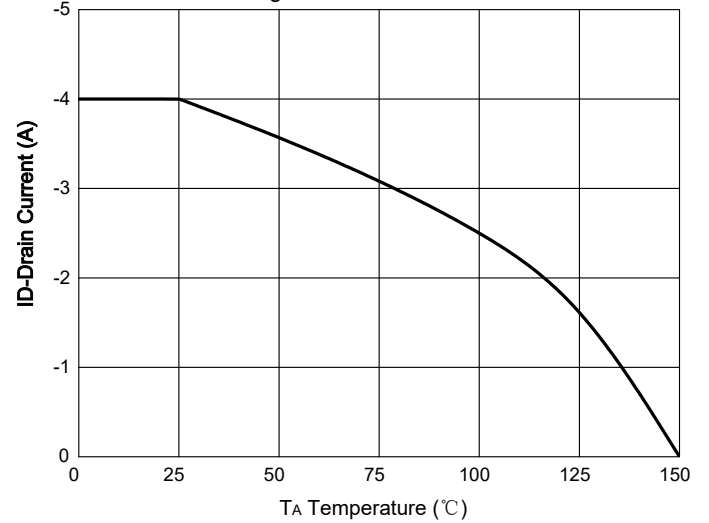
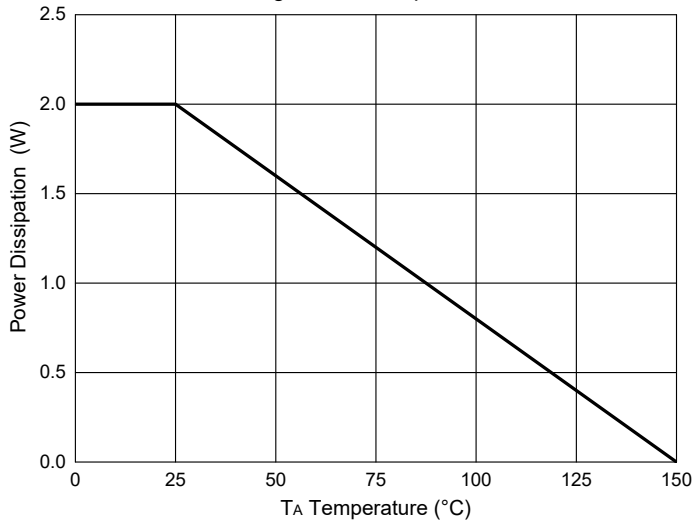


Fig. 11-PD Dissipation



Curve Characteristics

Fig. 12 - Safe Operation Area

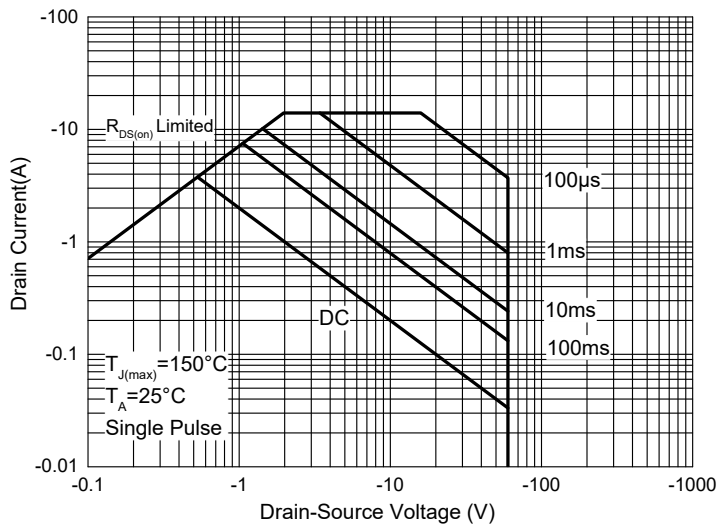
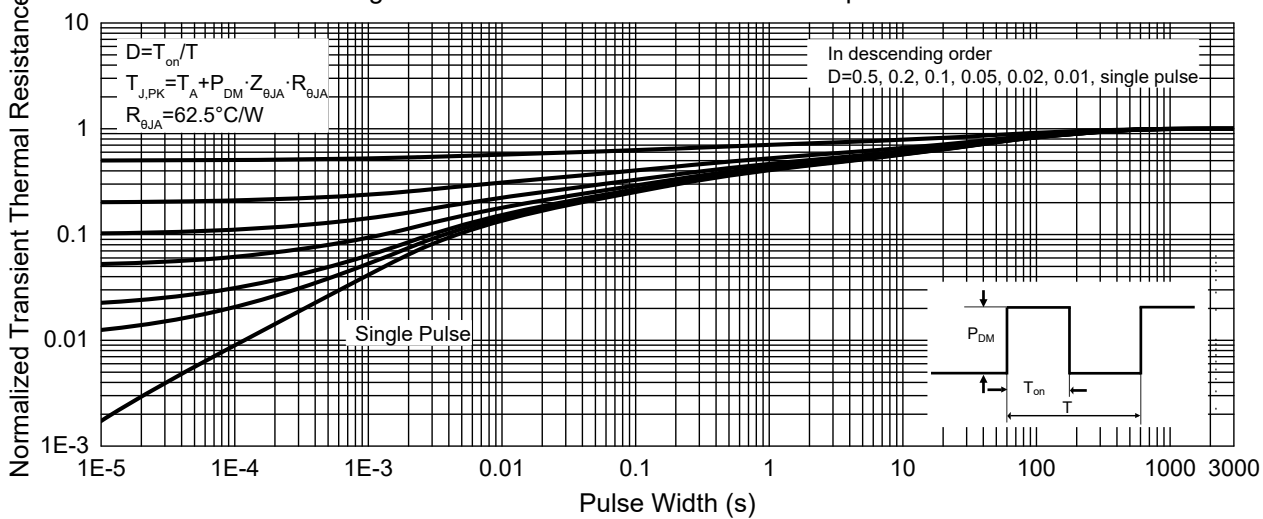


Fig. 13 - Normalized Transient Thermal Impedance



## Ordering Information

Device	Packing
Part Number-TP	Tape&Reel: 2.5Kpcs/Reel

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