

## Features

- Trench LV MOSFET Technology
- Low RDS(on)
- 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

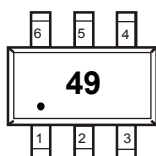
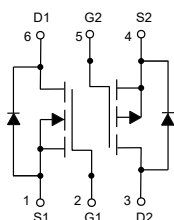
- Operating Junction Temperature Range : -55°C to +150°C
- Storage Temperature Range: -55°C to +150°C
- Thermal Resistance: 290°C/W Junction to Ambient<sup>(Note 2)</sup>

Parameter	Symbol	Rating	Unit
Total Power Dissipation <sup>(Note 4)</sup>	$P_D$	0.43	mW
<b>N-Channel MOSFET</b>			
Drain-Source Voltage	$V_{DS}$	20	V
Gate-Source Voltage	$V_{GS}$	±10	V
Continuous Drain Current	$I_D$	$T_A=25^\circ\text{C}$	1.5
		$T_A=100^\circ\text{C}$	0.95
Pulsed Drain Current <sup>(Note 3)</sup>	$I_{DM}$	6	A
<b>P-Channel MOSFET</b>			
Drain-Source Voltage	$V_{DS}$	-20	V
Gate-Source Voltage	$V_{GS}$	±10	V
Continuous Drain Current	$I_D$	$T_A=25^\circ\text{C}$	-1
		$T_A=100^\circ\text{C}$	-0.63
Pulsed Drain Current <sup>(Note 3)</sup>	$I_{DM}$	-4	A

Note:

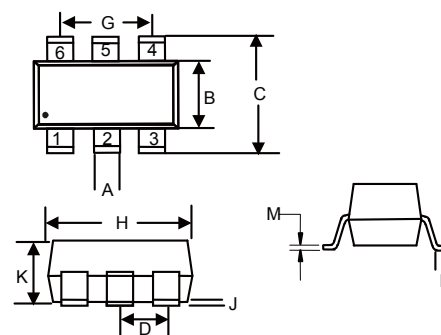
1. Halogen free "Green" products are defined as those which contain <900ppm bromine, <900ppm chlorine (<1500ppm total Br + Cl) and <1000ppm antimony compounds.
2. The value of  $R_{\theta JA}$  is measured with the device mounted on 1in<sup>2</sup> FR-4 board with 2oz. Copper, in a still air environment 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



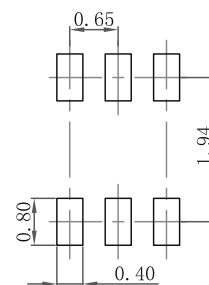
# Dual N&P-Channel MOSFET

## SOT-363



DIM	DIMENSIONS				NOTE
	INCHES		MM		
	MIN	MAX	MIN	MAX	
A	0.006	0.014	0.15	0.35	
B	0.045	0.053	1.15	1.35	
C	0.079	0.096	2.00	2.45	
D	0.026		0.65		TYP.
G	0.047	0.055	1.20	1.40	
H	0.071	0.087	1.80	2.20	
J	----	0.004	----	0.10	
K	0.031	0.043	0.80	1.10	
L	0.010	0.018	0.26	0.46	
M	0.003	0.006	0.08	0.15	

### Suggested Solder Pad Layout



**N-Channel MOSFET Electrical Characteristics @ 25°C (Unless Otherwise Specified)**

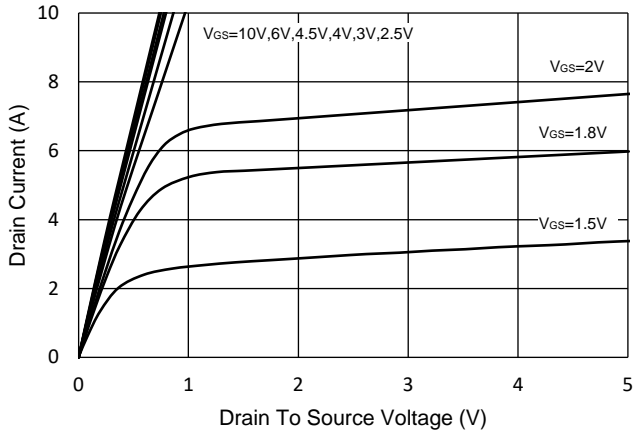
Parameter	Symbol	Test conditions	Min	Typ	Max	Unit
<b>Static Characteristics</b>						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	$V_{GS}=0V, I_D=250\mu A$	20			V
Gate-Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=250\mu A$	0.55	0.75	1.1	V
Gate-Body Leakage Current	$I_{GSS}$	$V_{GS}=\pm 10V, V_{DS}=0V$			$\pm 100$	nA
Zero Gate Voltage Drain Current	$I_{DSS}$	$V_{DS}=20V, V_{GS}=0V$			1	$\mu A$
Drain-Source On-Resistance	$R_{DS(on)}$	$V_{GS}=4.5V, I_D=1A$		75	90	m $\Omega$
		$V_{GS}=2.5V, I_D=0.6A$		86	105	
		$V_{GS}=1.8V, I_D=0.3A$		110	135	
Forward Transconductance	$g_{FS}$	$V_{DS}=5V, I_D=1.5A$		7.5		S
Gate Resistance	$R_g$	f=1 MHz, Open drain		1.8		$\Omega$
<b>Diode Characteristics</b>						
Continuous Body Diode Current	$I_S$				1.5	A
Diode Forward Voltage	$V_{SD}$	$V_{GS}=0V, I_S=1.5A$			1.2	V
Reverse Recovery Time	$t_{rr}$	$I_F=1.5A, dI_F/dt=100A/\mu s$		9		ns
Reverse Recovery Charge	$Q_{rr}$			2		nC
<b>Dynamic Characteristics</b>						
Input Capacitance	$C_{iss}$	$V_{DS}=10V, V_{GS}=0V, f=1MHz$		188		pF
Output Capacitance	$C_{oss}$			35		
Reverse Transfer Capacitance	$C_{rss}$			29		
Total Gate Charge	$Q_g$	$V_{DS}=10V, V_{GS}=4.5V, I_D=1.5A$		2.7		nC
Gate-Source Charge	$Q_{gs}$			0.3		
Gate-Drain Charge	$Q_{gd}$			0.5		
Turn-On Delay Time	$t_{d(on)}$	$V_{DD}=10V, V_{GS}=4.5V, R_G=3\Omega, I_D=1.5A$		4		ns
Turn-On Rise Time	$t_r$			5		
Turn-Off Delay Time	$t_{d(off)}$			10		
Turn-Off Fall Time	$t_f$			2		

**P-Channel MOSFET Electrical Characteristics @ 25°C (Unless Otherwise Specified)**

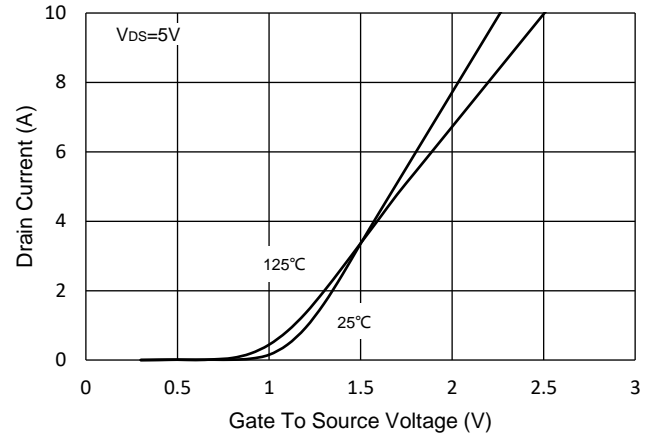
Parameter	Symbol	Test conditions	Min	Typ	Max	Unit
<b>Static Characteristics</b>						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	$V_{GS}=0V, I_D=-250\mu A$	-20			V
Gate-Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=-250\mu A$	-0.4	-0.62	-1	V
Gate-Body Leakage Current	$I_{GSS}$	$V_{GS}=\pm 10V, V_{DS}=0V$			$\pm 100$	nA
Zero Gate Voltage Drain Current	$I_{DSS}$	$V_{DS}=-20V, V_{GS}=0V$			-1	$\mu A$
Drain-Source On-Resistance	$R_{DS(on)}$	$V_{GS}=-4.5V, I_D=-1A$		119	150	m $\Omega$
		$V_{GS}=-2.5V, I_D=-0.6A$		150	180	
		$V_{GS}=-1.8V, I_D=-0.3A$		193	260	
Forward Transconductance	$g_{FS}$	$V_{DS}=-5V, I_D=-1A$		4.5		S
Gate Resistance	$R_g$	f=1 MHz, Open drain		15		$\Omega$
<b>Diode Characteristics</b>						
Continuous Body Diode Current	$I_S$				-1	A
Diode Forward Voltage	$V_{SD}$	$V_{GS}=0V, I_S=-0.5A$			-1.2	V
Reverse Recovery Time	$t_{rr}$	$I_F=-1A, dI_F/dt=100A/\mu s$		13		ns
Reverse Recovery Charge	$Q_{rr}$			3		nC
<b>Dynamic Characteristics</b>						
Input Capacitance	$C_{iss}$	$V_{DS}=-10V, V_{GS}=0V, f=1MHz$		220		pF
Output Capacitance	$C_{oss}$			35		
Reverse Transfer Capacitance	$C_{rss}$			28		
Total Gate Charge	$Q_g$	$V_{DS}=-10V, V_{GS}=-4.5V, I_D=-1A$		3.2		nC
Gate-Source Charge	$Q_{gs}$			0.4		
Gate-Drain Charge	$Q_{gd}$			0.6		
Turn-On Delay Time	$t_{d(on)}$	$V_{DD}=-10V, V_{GS}=-4.5V, R_G=3\Omega, I_D=-1A$		8		ns
Turn-On Rise Time	$t_r$			6		
Turn-Off Delay Time	$t_{d(off)}$			27		
Turn-Off Fall Time	$t_f$			12		

## Curve Characteristics (N-Channel)

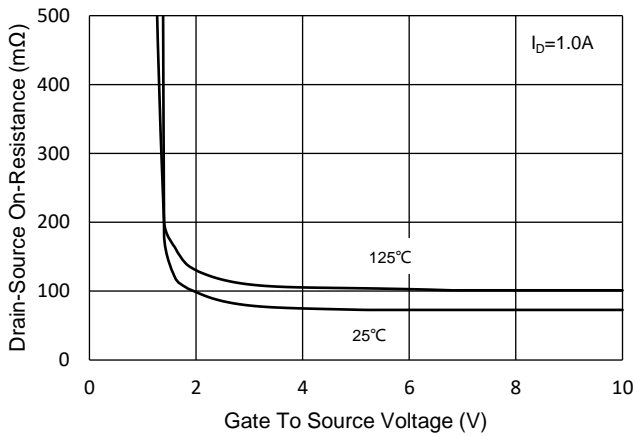
**Fig.1 - Typical Output Characteristics**



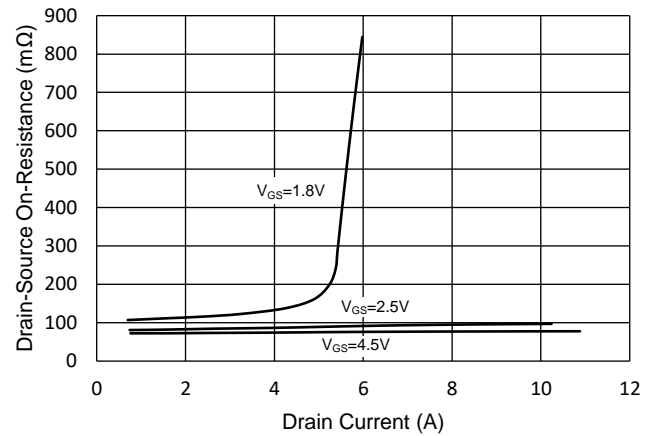
**Fig.2 - Transfer Characteristic**



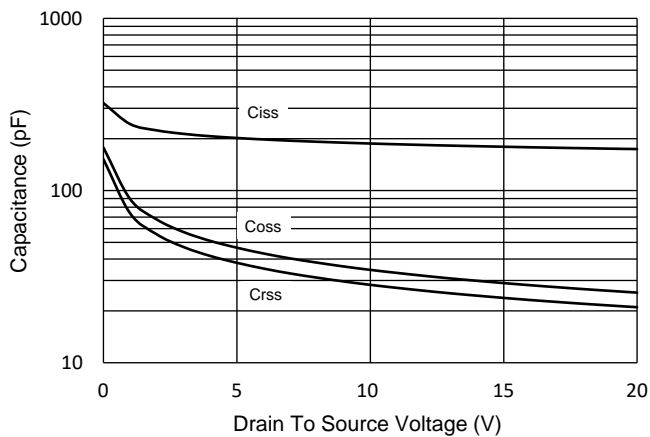
**Fig.3 -  $R_{DS(ON)}$  -  $V_{GS}$**



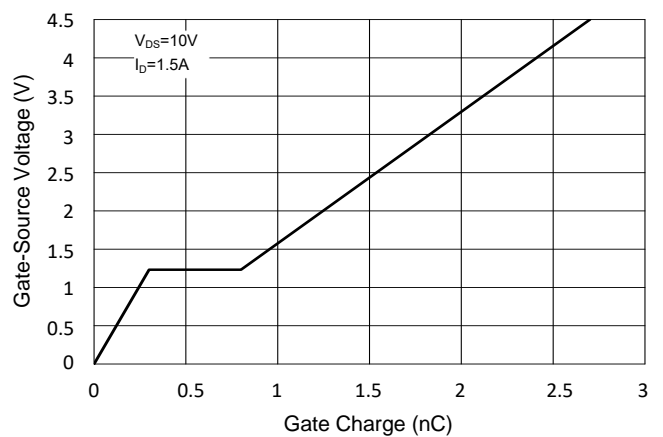
**Fig.4 -  $R_{DS(ON)}$  -  $I_D$**



**Fig.5 - Capacitance Characteristics**

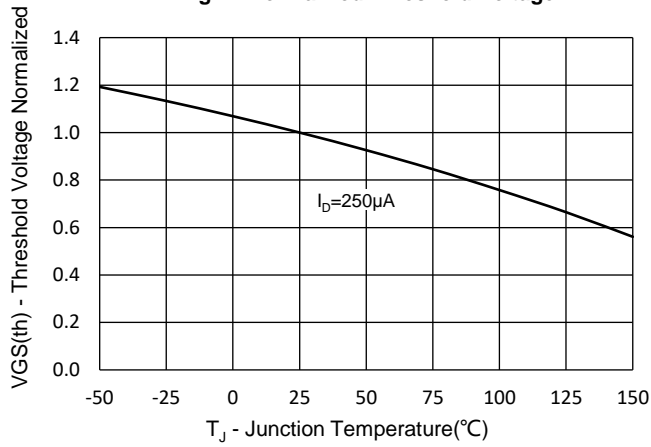


**Fig.6 - Gate Charge**

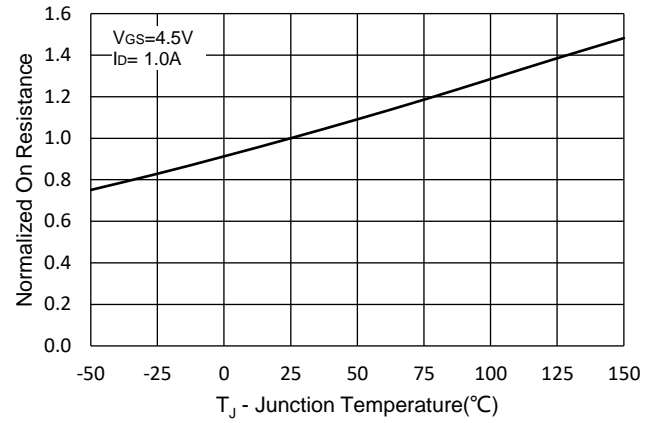


## Curve Characteristics (N-Channel)

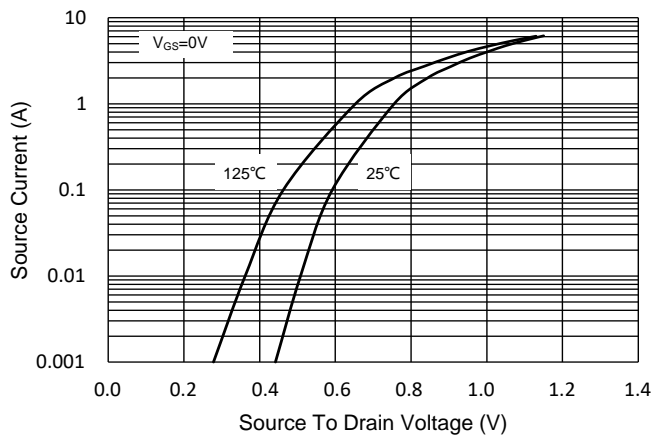
**Fig.7 - Normalized Threshold Voltage**



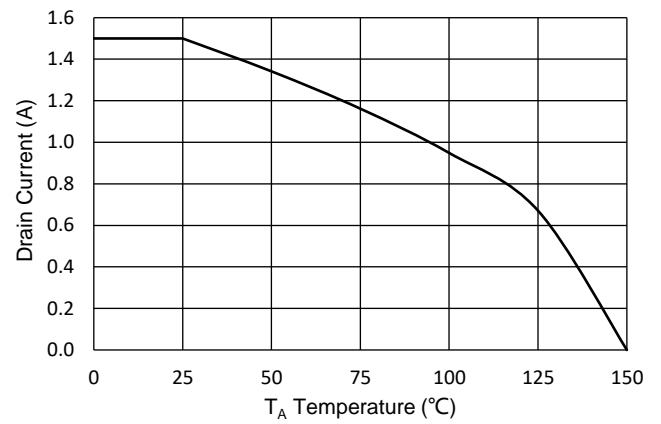
**Fig.8 - Normalized On Resistance Characteristics**



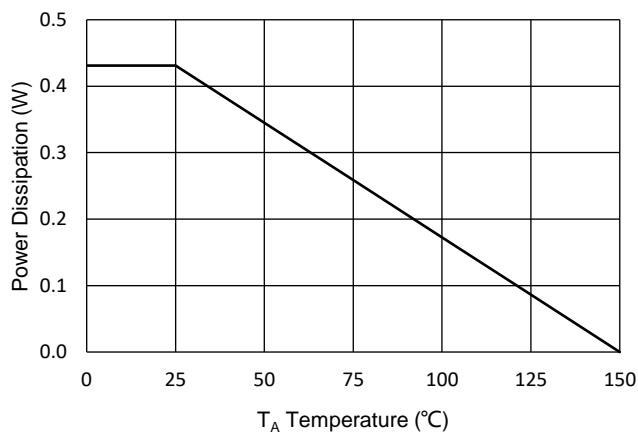
**Fig.9 -  $I_S - V_{SD}$**



**Fig.10 - Drain Current**

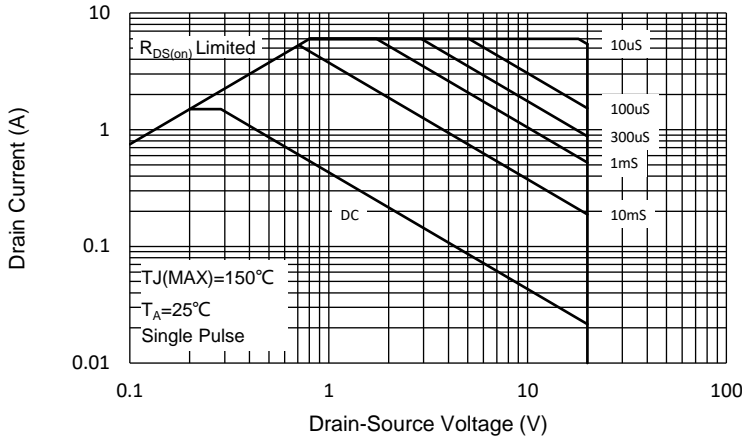


**Fig.11 - PD Dissipation**

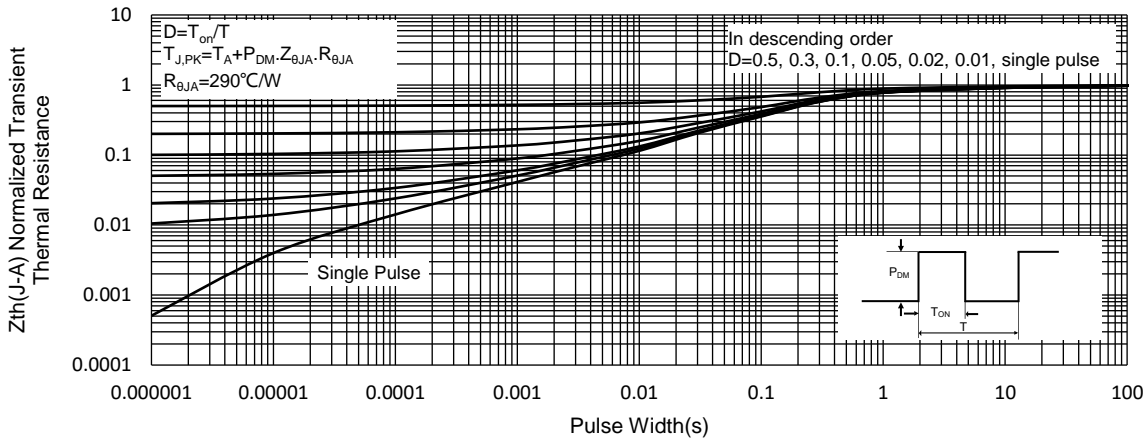


## Curve Characteristics (N-Channel)

**Fig.12 - Safe Operation Area**

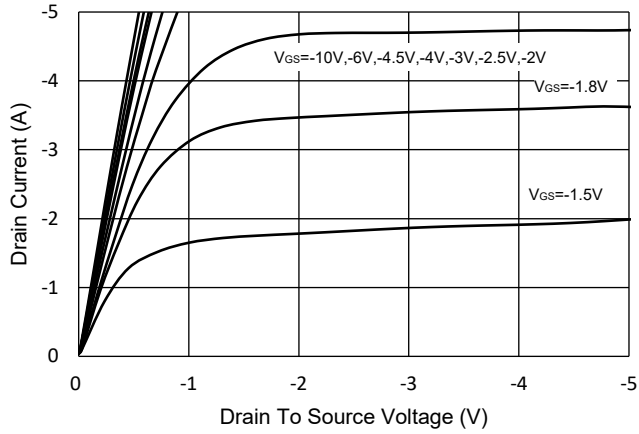


**Fig.13 - Normalized Transient Thermal Impedance**

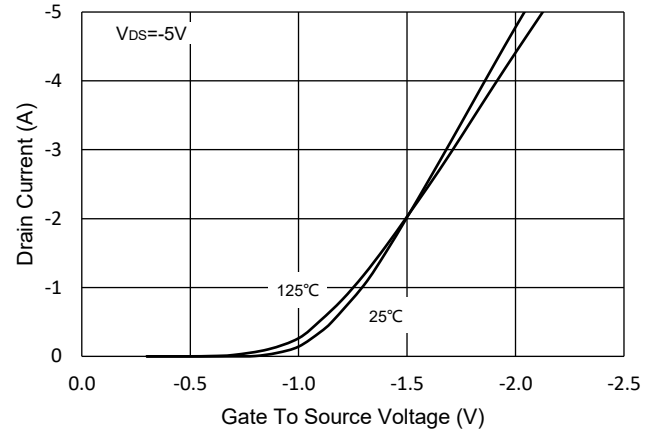


## Curve Characteristics (P-Channel)

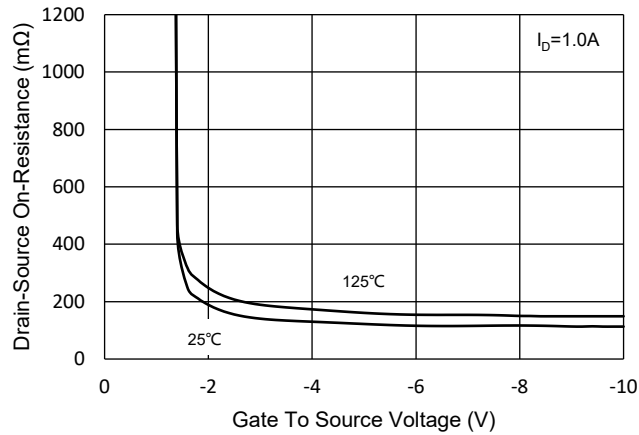
**Fig.1 - Typical Output Characteristics**



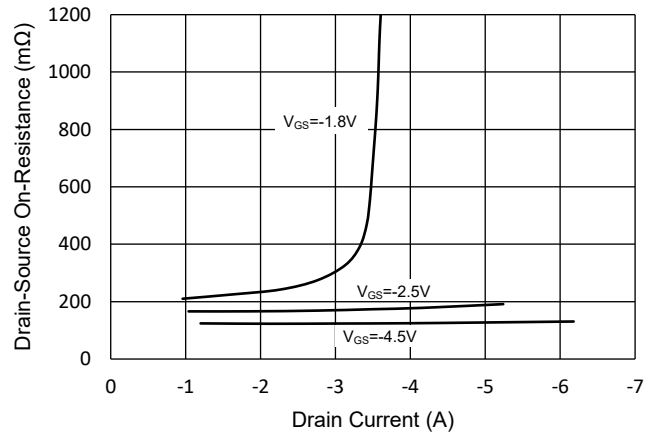
**Fig.2 - Transfer Characteristic**



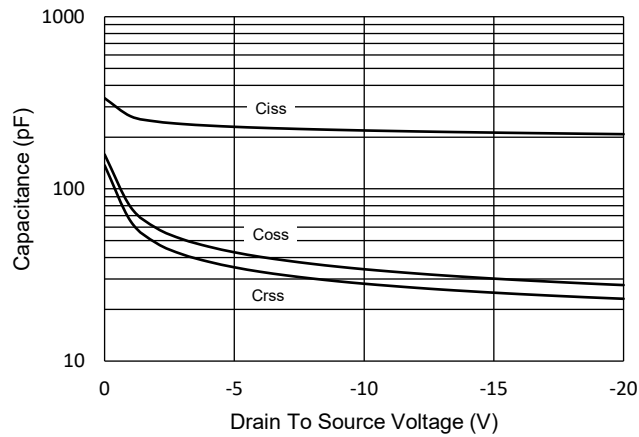
**Fig.3 -  $R_{DS(ON)}$  -  $V_{GS}$**



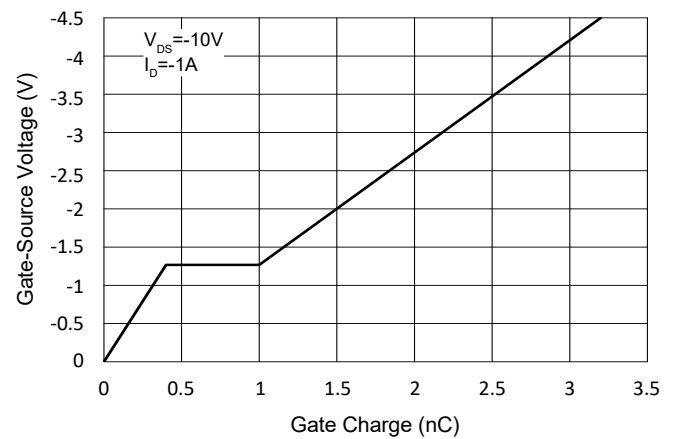
**Fig.4 -  $R_{DS(ON)}$  -  $I_D$**



**Fig.5 - Capacitance Characteristics**

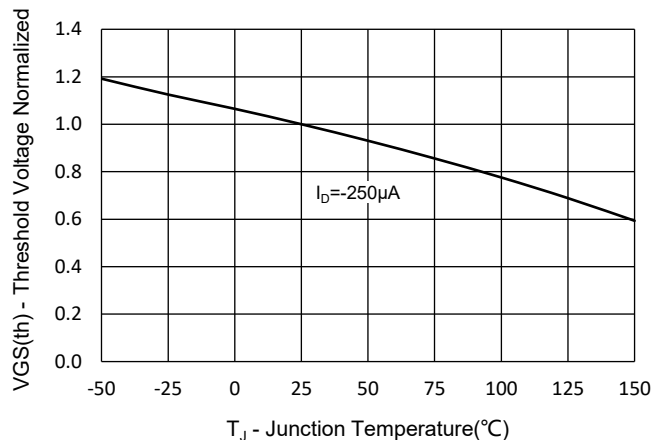


**Fig.6 - Gate Charge**

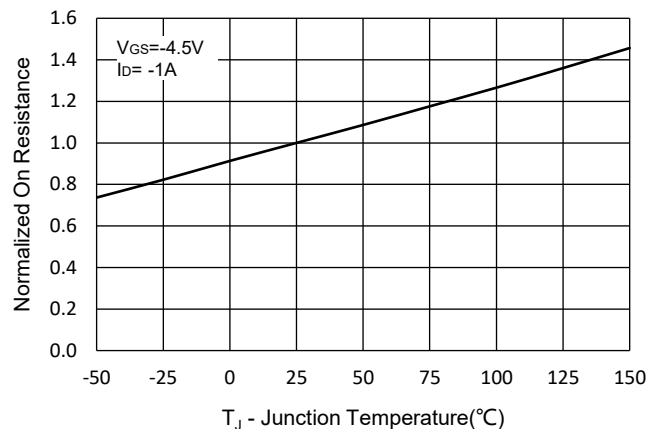


### Curve Characteristics (P-Channel)

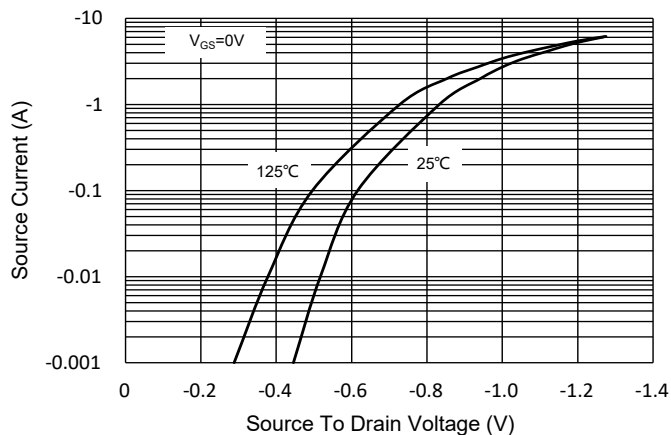
**Fig.7 - Normalized Threshold Voltage**



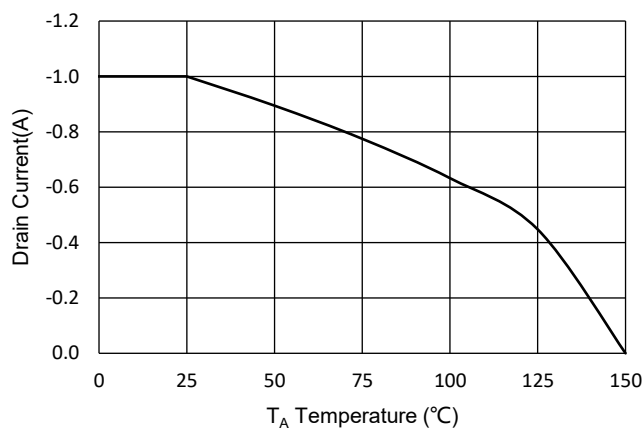
**Fig.8 - Normalized On Resistance Characteristics**



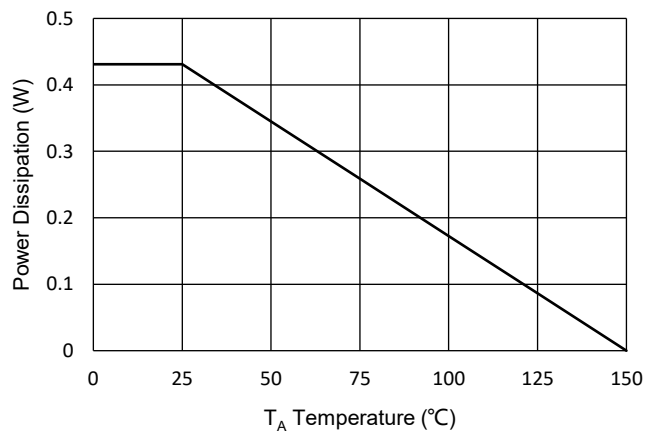
**Fig.9 - I<sub>S</sub> - V<sub>SD</sub>**



**Fig.10 - Drain Current**



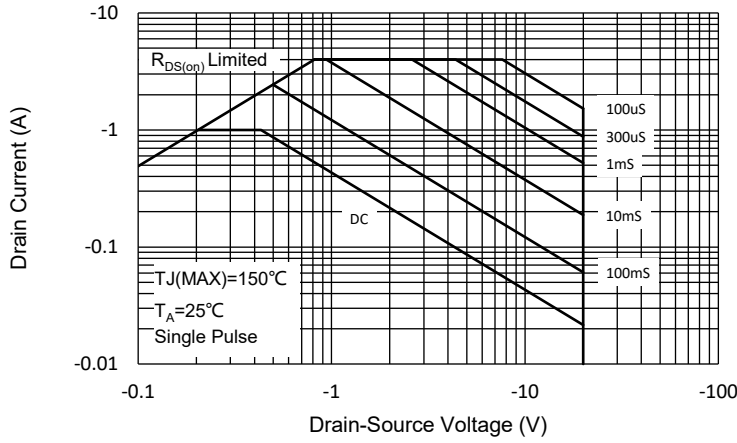
**Fig.11 - PD Dissipation**



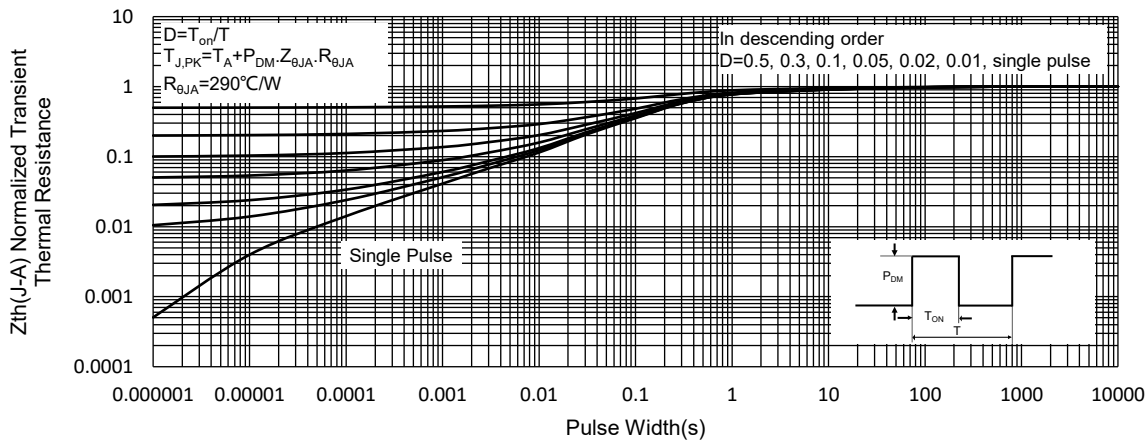


### Curve Characteristics (P-Channel)

**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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