

Features

- ESD HBM Class 2
- Low Threshold
- 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

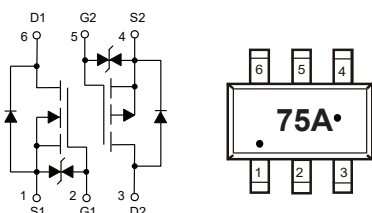
- Operating Junction Temperature Range : -55°C to +150°C
- Storage Temperature Range: -55°C to +150°C
- Thermal Resistance: 390°C/W Junction to Ambient (Note 2)

Parameter		Symbol	Rating	Unit
Total Power Dissipation (Note 3)		P_D	320	mW
N-Channel MOSFET				
Drain-Source Voltage		V_{DS}	60	V
Gate-Source Voltage		V_{GS}	±20	V
Continuous Drain Current	$T_A=25^\circ\text{C}$	I_D	0.34	A
	$T_A=100^\circ\text{C}$		0.22	
Pulsed Drain Current (Note 4)		I_{DM}	1.36	A
P-Channel MOSFET				
Drain-Source Voltage		V_{DS}	-50	V
Gate-Source Voltage		V_{GS}	±20	V
Continuous Drain Current	$T_A=25^\circ\text{C}$	I_D	-0.18	A
	$T_A=100^\circ\text{C}$		-0.11	
Pulsed Drain Current (Note 4)		I_{DM}	-0.72	A

Note:

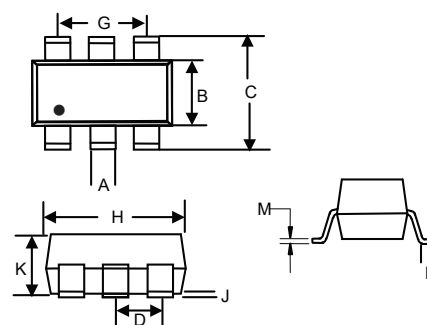
1. Halogen free "Green" products are defined as those which contain <900ppm bromine, <900ppm chlorine (<1500ppm total Br + Cl) and <1000ppm antimony compounds.
2. The value of $R_{\theta JA}$ is measured with the device mounted on the minimum recommend pad size, in the still air environment with $T_A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

Internal Structure and Marking Code



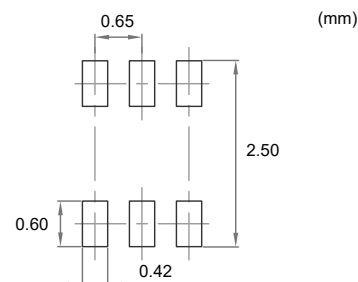
Dual N&P-Channel MOSFET

SOT-363S



DIM	INCHES		MM		NOTE
	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	0.087	2.00	2.20	
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	0.041	0.80	1.00	
L	0.008	0.016	0.20	0.40	
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
Static Characteristics						
Drain-Source Breakdown Voltage	V _{(BR)DSS}	V _{GS} =0V, I _D =250μA	60			V
Gate-Source Leakage Current	I _{GSS}	V _{DS} =0V, V _{GS} =±20V			±10	μA
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} =60V, V _{GS} =0V			1	μA
Gate-Threshold Voltage	V _{GS(th)}	V _{DS} =V _{GS} , I _D =250μA	1	1.4	2.0	V
Drain-Source On-Resistance	R _{DS(on)}	V _{GS} =10V, I _D =0.3A		1.7	2.5	Ω
		V _{GS} =4.5V, I _D =0.2A		1.9	3	
Forward Transconductance	g _{FS}	V _{DS} =-5V, I _D =-0.13A		0.37		S
Gate Resistance	R _G	f=1MHz, Open drain		133		Ω
Diode Characteristics						
Continuous Body Diode Current	I _S				0.34	A
Diode Forward Voltage	V _{SD}	V _{GS} =0V, I _S =0.3A			1.2	V
Reverse Recovery Time	t _{rr}	I _F =0.3A, dI _F /dt=100A/μs		11		ns
Reverse Recovery Charge	Q _{rr}			3		nC
Dynamic Characteristics						
Input Capacitance	C _{iss}	V _{DS} =30V, V _{GS} =0V, f=1MHz		15.2		pF
Output Capacitance	C _{oss}			5.2		
Reverse Transfer Capacitance	C _{rss}			2.3		
Total Gate Charge	Q _g	V _{DS} =30V, V _{GS} =10V, I _D =0.3A		0.8		nC
Gate-Source Charge	Q _{gs}			0.1		
Gate-Drain Charge	Q _{gd}			0.2		
Turn-On Delay Time	t _{d(on)}	V _{DD} =30V, V _{GS} =10V, R _G =6Ω, I _D =0.3A		2.2		ns
Turn-On Rise Time	t _r			2.8		
Turn-Off Delay Time	t _{d(off)}			5.8		
Turn-Off Fall Time	t _f			10		

P-Channel Electrical Characteristics @ 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 =-250μA	-50			V
Gate-Source Leakage Current	I _{GSS}	V _{DS} =0V, V _{GS} =±20V			±10	μA
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} =-50V, V _{GS} =0V			-1	μA
Gate-Threshold Voltage	V _{GS(th)}	V _{DS} =V _{GS} , I _D =-250μA	-0.9	-1.4	-2	V
Drain-Source On-Resistance	R _{DS(on)}	V _{GS} =-10V, I _D =-0.5A		2.1	6	Ω
		V _{GS} =-4.5V, I _D =-0.2A		2.5	7	
Forward Transconductance	g _{FS}	V _{DS} =-5V, I _D =-0.13A		0.37		S
Gate Resistance	R _G	f=1MHz, Open drain		878		Ω
Diode Characteristics						
Continuous Body Diode Current	I _S				-0.18	A
Diode Forward Voltage	V _{SD}	V _{GS} =0V, I _S =-0.5A			-1.2	V
Reverse Recovery Time	t _{rr}	I _F =-0.15A, dI _F /dt=100A/μs		11		ns
Reverse Recovery Charge	Q _{rr}			4		nC
Dynamic Characteristics						
Input Capacitance	C _{iss}	V _{DS} =-25V, V _{GS} =0V, f=1MHz		37		pF
Output Capacitance	C _{oss}			6		
Reverse Transfer Capacitance	C _{rss}			4		
Total Gate Charge	Q _g	V _{DS} =-25V, V _{GS} =-10V, I _D =-0.15A		2.7		nC
Gate-Source Charge	Q _{gs}			0.4		
Gate-Drain Charge	Q _{gd}			0.2		
Turn-On Delay Time	t _{d(on)}	V _{DD} =-25V, V _{GS} =-10V, R _G =2.5Ω, I _D =-0.15A		8		ns
Turn-On Rise Time	t _r			3.8		
Turn-Off Delay Time	t _{d(off)}			38.6		
Turn-Off Fall Time	t _f			23.5		

Curve Characteristics(N-Channel)

Fig.1 - Typical Output Characteristics

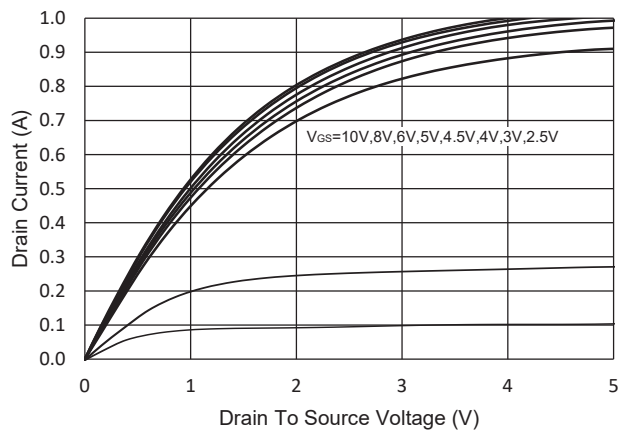


Fig.2 - Transfer Characteristic

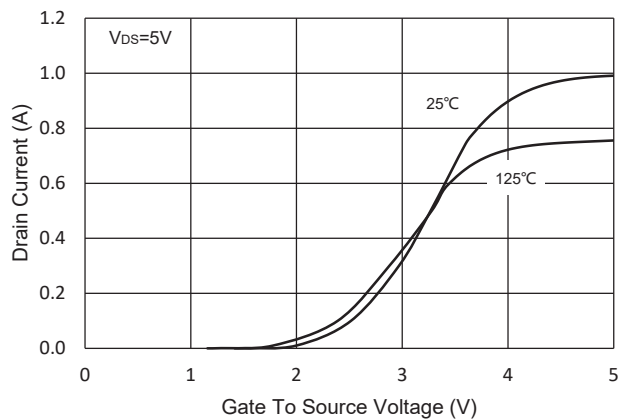


Fig.3 - $R_{DS(ON)}$ - V_{GS}

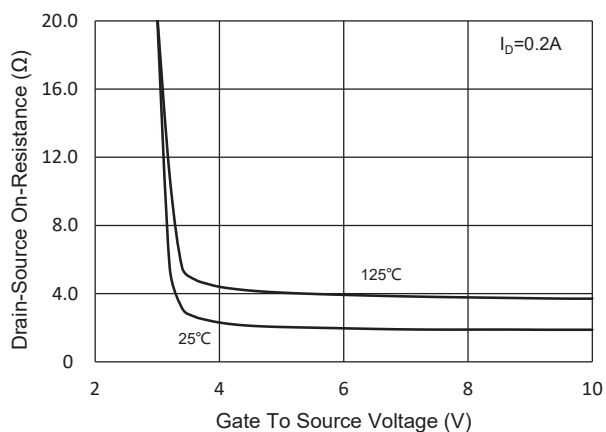


Fig.4 - $R_{DS(ON)}$ - I_D

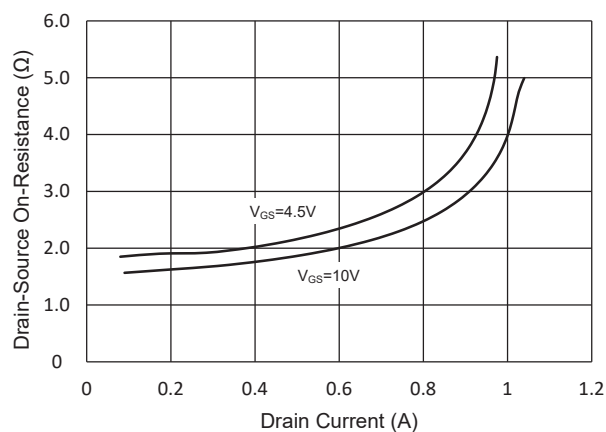


Fig.5 - Capacitance Characteristics

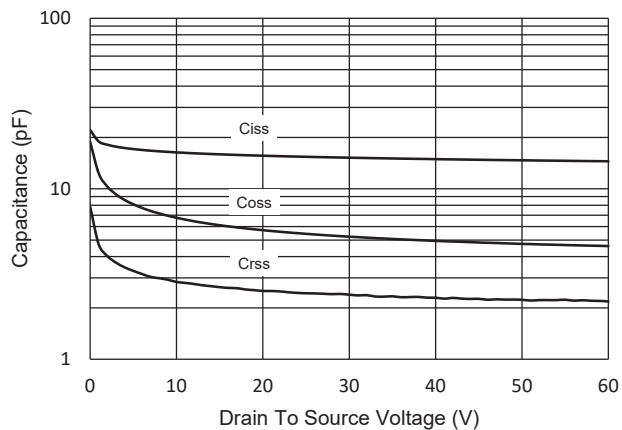
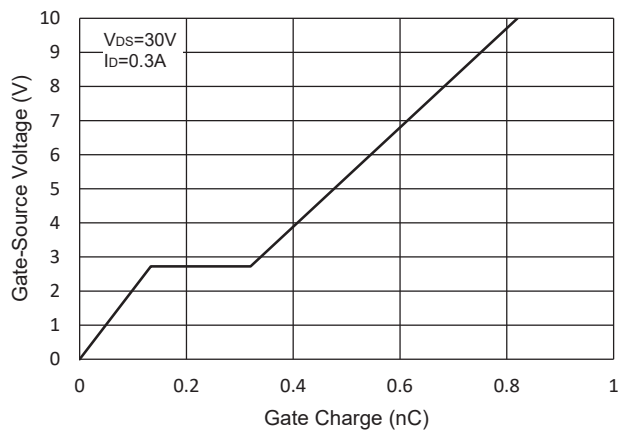


Fig.6 - Gate Charge



Curve Characteristics(N-Channel)

Fig.7 - Normalized Threshold Voltage

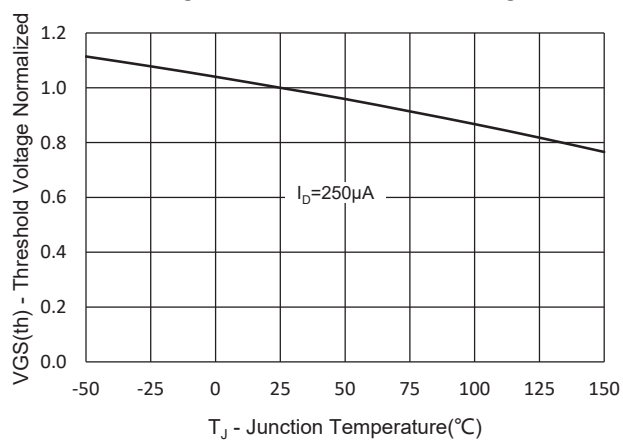


Fig.8 - Normalized On Resistance Characteristics

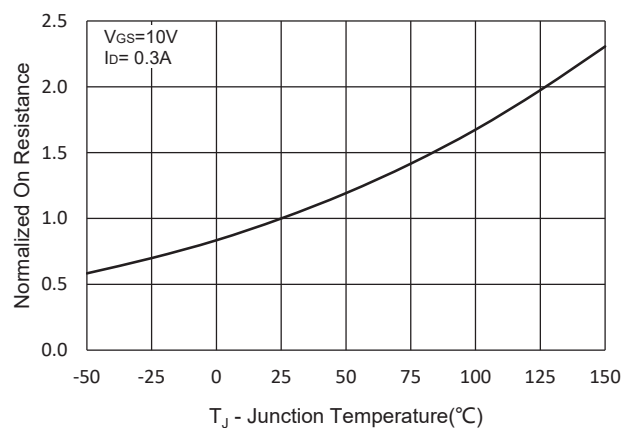


Fig.9 - $I_S - V_{SD}$

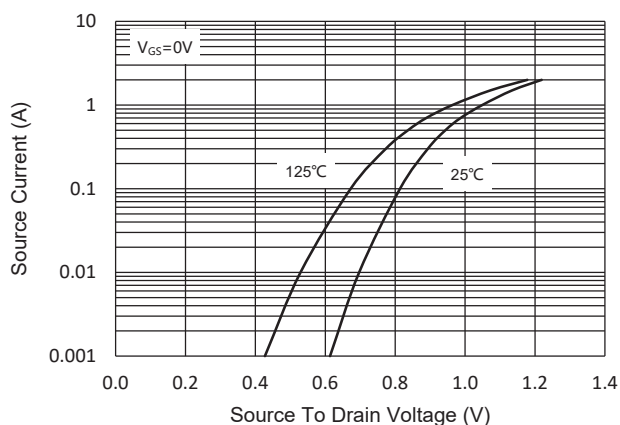


Fig.10 - Drain Current

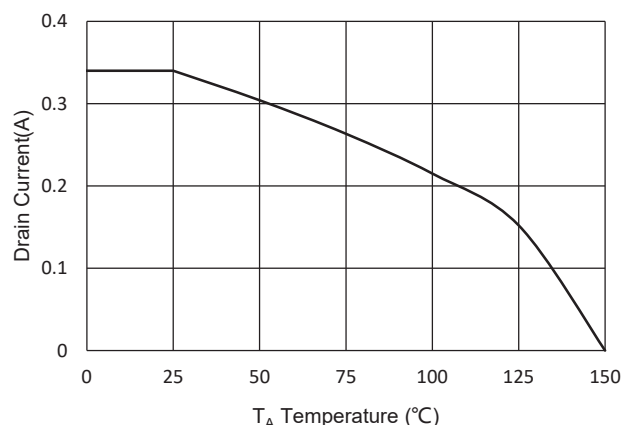
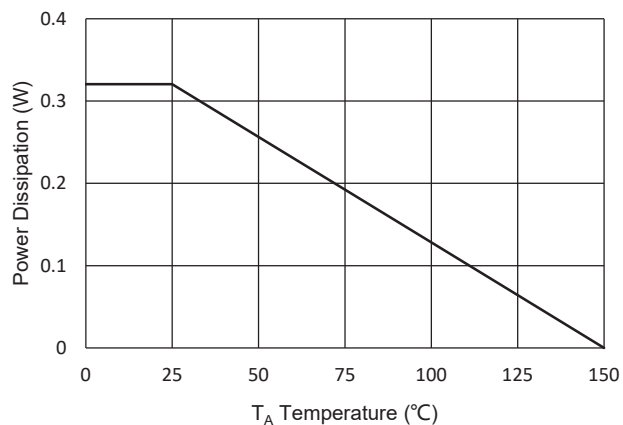


Fig.11 - PD Dissipation



Curve Characteristics(N-Channel)

Fig.12 - Safe Operation Area

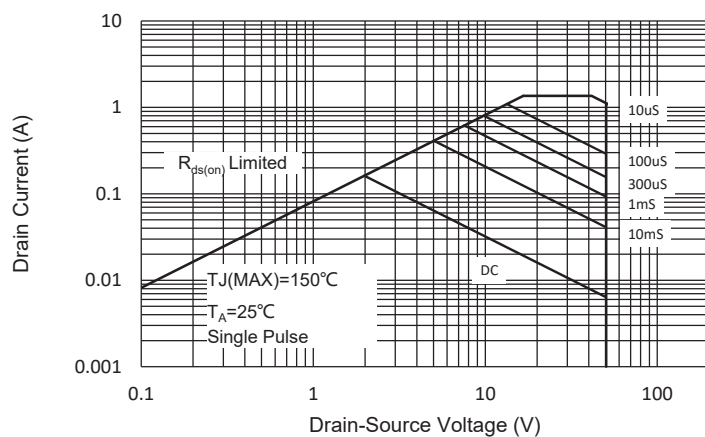
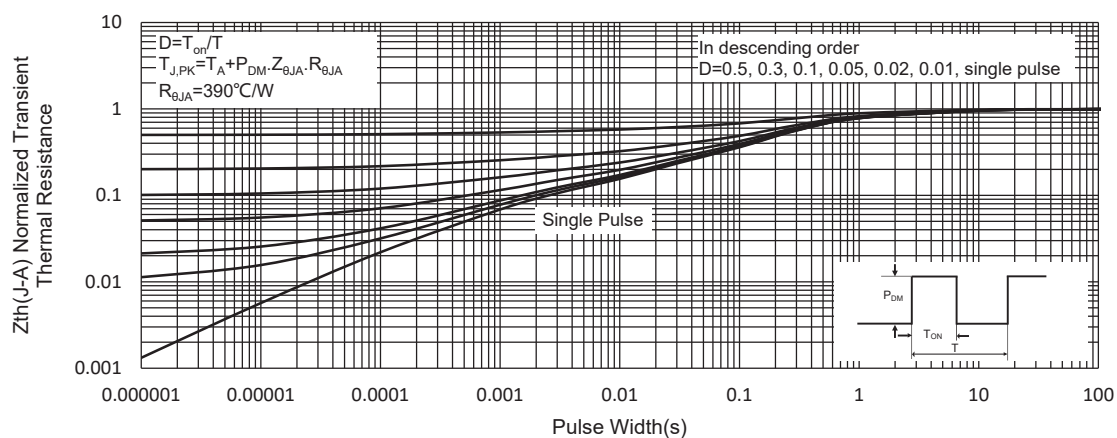


Fig.13 - Normalized Transient Thermal Impedance



Curve Characteristics(P-Channel)

Fig.1 - Typical Output Characteristics

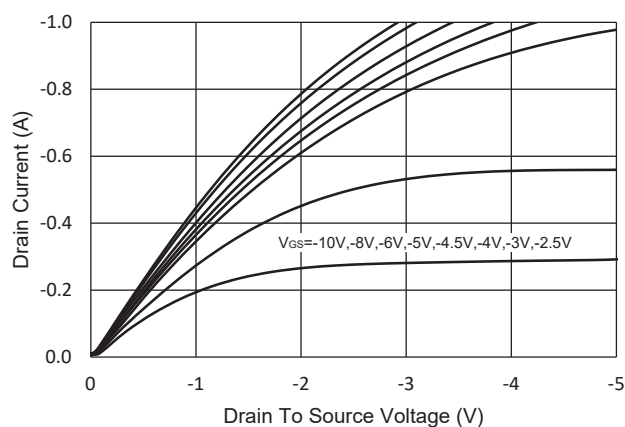


Fig.2 - Transfer Characteristic

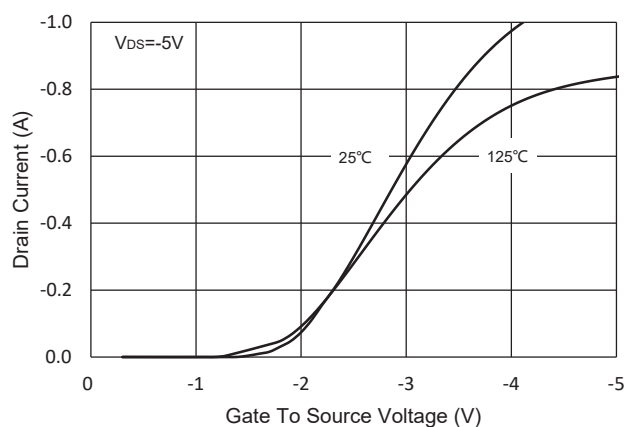


Fig.3 - $R_{DS(ON)}$ - V_{GS}

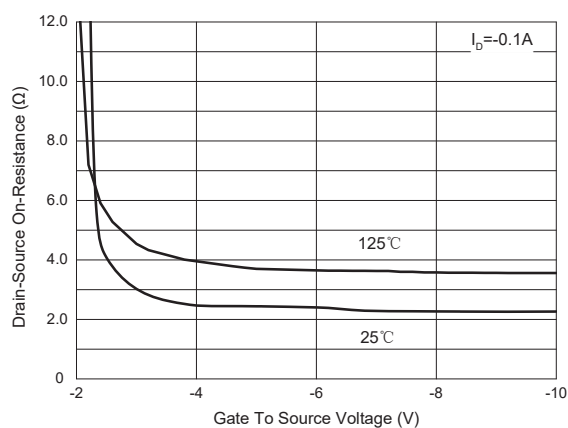


Fig.4 - $R_{DS(ON)}$ - I_D

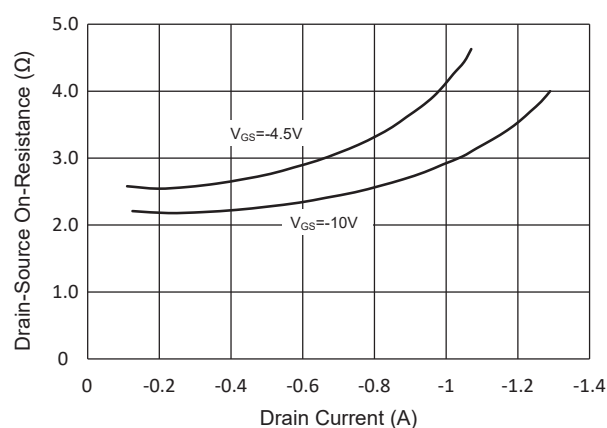


Fig.5 - Capacitance Characteristics

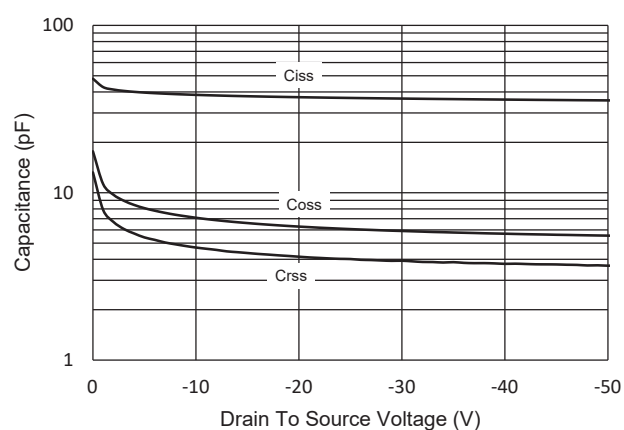
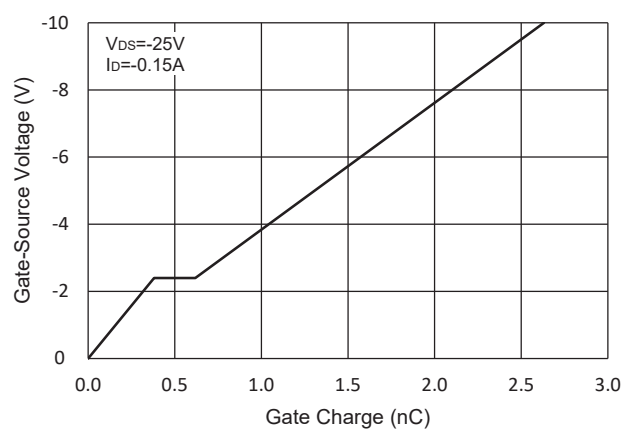


Fig.6 - Gate Charge



Curve Characteristics(P-Channel)

Fig.7 - Normalized Threshold Voltage

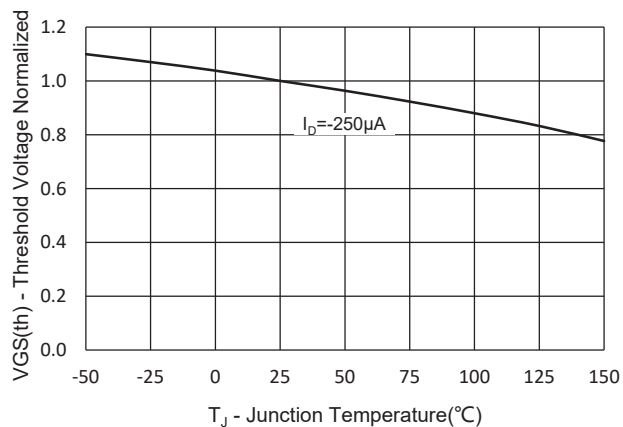


Fig.8 - Normalized On Resistance Characteristics

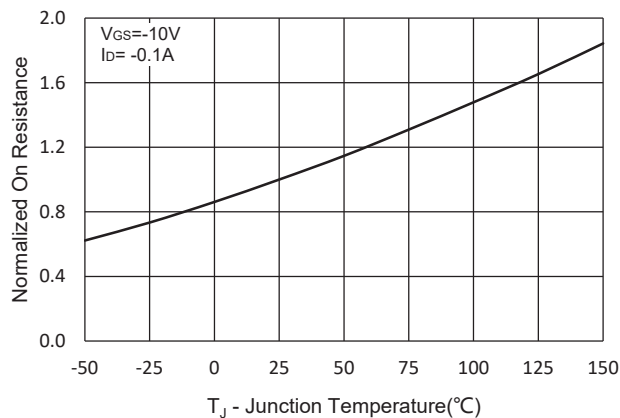


Fig.9 - $I_S - V_{SD}$

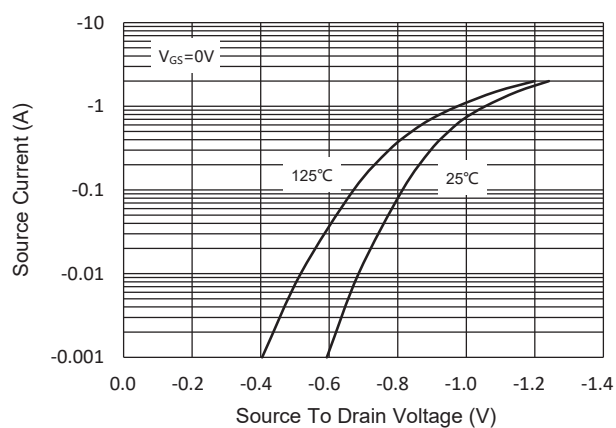


Fig.10 - Drain Current

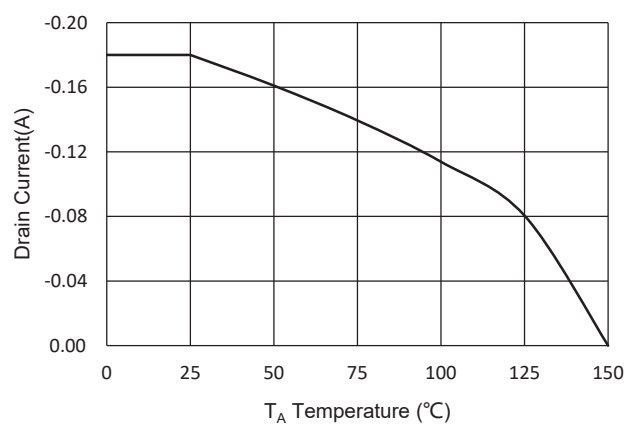
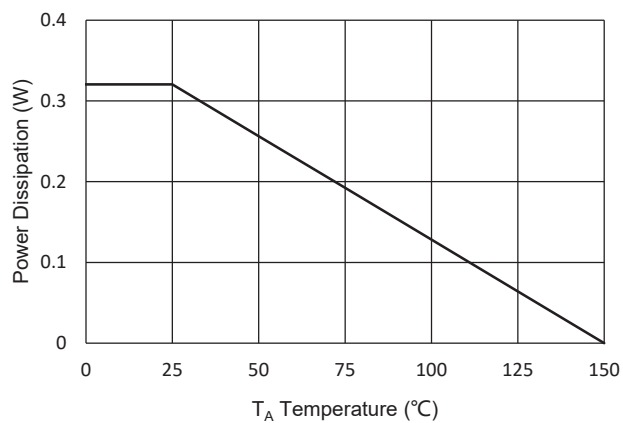


Fig.11 - PD Dissipation



Curve Characteristics(P-Channel)

Fig.12 - Safe Operation Area

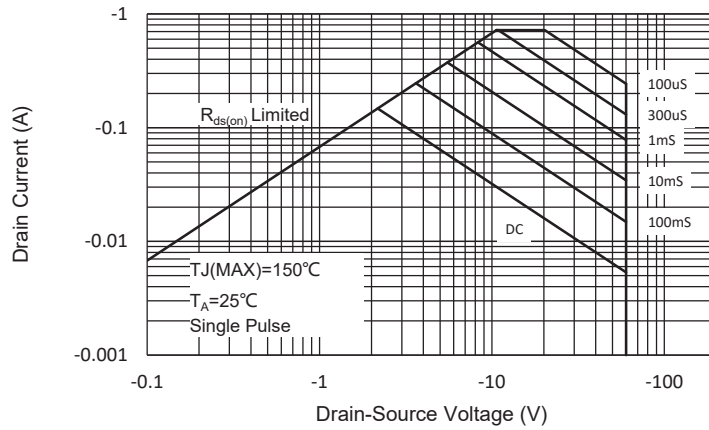
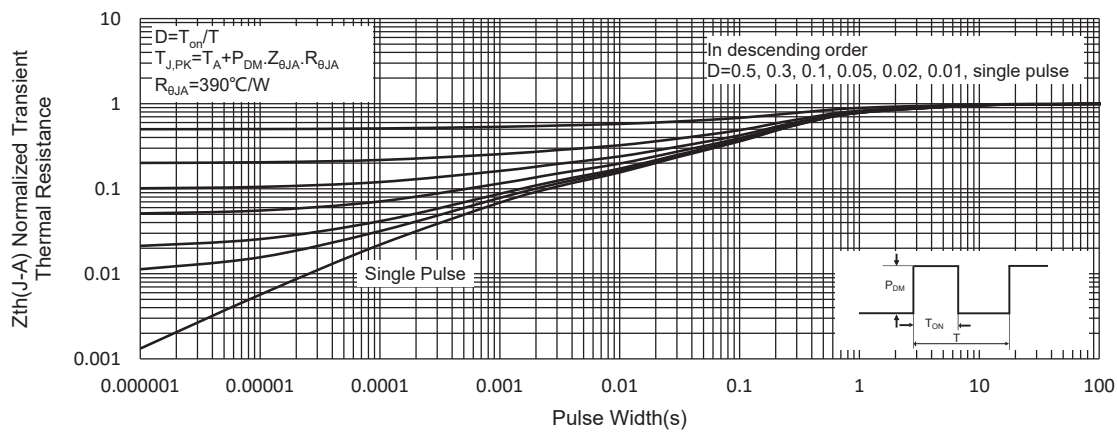


Fig.13 - Normalized Transient Thermal Impedance



Ordering Information

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

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