

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)

Maximum Ratings

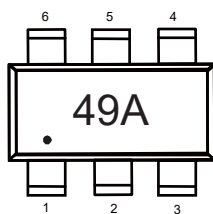
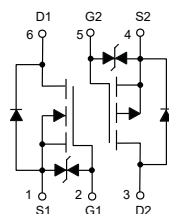
- Operating Junction Temperature Range : -55°C to +150°C
- Storage Temperature Range: -55°C to +150°C
- Thermal Resistance: 400°C/W Junction to Ambient (Note 2)

Parameter		Symbol	Rating	Unit
Total Power Dissipation ^(Note 4)		P _D	312	mW
N-Channel MOSFET				
Drain-Source Voltage		V _{DS}	20	V
Gate-Source Voltage		V _{GS}	±12	V
Continuous Drain Current	T _A =25°C	I _D	0.75	A
	T _A =100°C		0.47	
Pulsed Drain Current ^(Note 3)		I _{DM}	3	A
P-Channel MOSFET				
Drain-Source Voltage		V _{DS}	-20	V
Gate-Source Voltage		V _{GS}	±12	V
Continuous Drain Current	T _A =25°C	I _D	-0.6	A
	T _A =100°C		-0.38	
Pulsed Drain Current ^(Note 3)		I _{DM}	-2.4	A

Note:

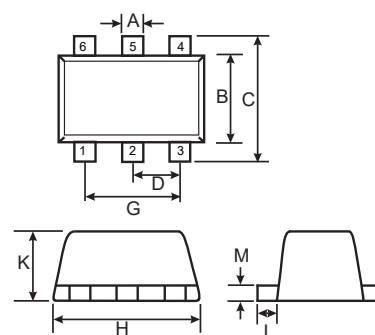
1. Halogen free "Green" products are defined as those which contain <900ppm bromine, <900ppm chlorine (<1500ppm total Br + Cl) and <1000ppm antimony compounds.
2. The value of $R_{\theta JA}$ is measured with the device mounted on 1in² FR-4 board with 2oz. Copper, in a still air environment with $T_A = 25^\circ\text{C}$.
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-563



DIMENSIONS					
DIM	INCHES		MM		NOTE
	MIN	MAX	MIN	MAX	
A	0.006	0.011	0.15	0.30	
B	0.043	0.051	1.10	1.30	
C	0.059	0.067	1.50	1.70	
D	0.020		0.50		TYP.
G	0.035	0.043	0.90	1.10	
H	0.059	0.067	1.50	1.70	
K	0.022	0.026	0.55	0.65	
L	0.004	0.011	0.10	0.30	
M	0.004	0.007	0.10	0.18	

N-Channel ELECTRICAL CHARACTERISTICS (Ta=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	20			V
Gate-Threshold Voltage	V _{GS(th)}	V _{DS} =V _{GS} , I _D =250μA	0.5	0.74	1.1	V
Gate-Body Leakage Current	I _{GSS}	V _{GS} =±10V, V _{DS} =0V			±10	μA
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} =20V, V _{GS} =0V			1	μA
Drain-Source On-Resistance	R _{DS(on)}	V _{GS} =4.5V, I _D =500mA		200	300	mΩ
		V _{GS} =2.5V, I _D =400mA		280	400	
		V _{GS} =1.8V, I _D =200mA		520	700	
Forward Transconductance	g _{FS}	V _{DS} =5V, I _D =500mA		1.6		S
Gate Resistance	R _g	f=1 MHz, Open drain		18		Ω
Diode Characteristics						
Continuous Body Diode Current	I _S				750	mA
Diode Forward Voltage	V _{SD}	V _{GS} =0V, I _S =500mA			1.2	V
Reverse Recovery Time	t _{rr}	I _F =380mA, dI _F /dt=100A/μs		7		ns
Reverse Recovery Charge	Q _{rr}			1		nC
Dynamic Characteristics						
Input Capacitance	C _{iss}	V _{DS} =16V, V _{GS} =0V, f=1MHz		27		pF
Output Capacitance	C _{oss}			10		
Reverse Transfer Capacitance	C _{rss}			4.8		
Total Gate Charge	Q _g	V _{DS} =10V, V _{GS} =4.5V, I _D =1A		0.6		nC
Gate-Source Charge	Q _{gs}			0.13		
Gate-Drain Charge	Q _{gd}			0.15		
Turn-On Delay Time	t _{d(on)}	V _{DD} =10V, V _{GS} =4.5V, R _G =10Ω, I _D =500mA		3		ns
Turn-On Rise Time	t _r			4		
Turn-Off Delay Time	t _{d(off)}			7		
Turn-Off Fall Time	t _f			4		

P-Channel ELECTRICAL CHARACTERISTICS (Ta=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	-20			V
Gate-Threshold Voltage	V _{GS(th)}	V _{DS} =V _{GS} , I _D =-250μA	-0.5	-0.65	-1.1	V
Gate-Body Leakage Current	I _{GSS}	V _{GS} =±10V, V _{DS} =0V			±10	μA
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} =-20V, V _{GS} =0V			-1	μA
Drain-Source On-Resistance	R _{DS(on)}	V _{GS} =-4.5V, I _D =-500mA		0.66	0.85	Ω
		V _{GS} =-2.5V, I _D =-300mA		0.95	1.2	
		V _{GS} =-1.8V, I _D =-200mA		1.4	2	
Forward Transconductance	g _{FS}	V _{DS} =-5V, I _D =-500mA		1		S
Gate Resistance	R _g	f=1 MHz, Open drain		30		Ω
Diode Characteristics						
Continuous Body Diode Current	I _S				-0.6	A
Diode Forward Voltage	V _{SD}	V _{GS} =0V, I _S =-500mA			-1.2	V
Reverse Recovery Time	t _{rr}	I _F =-380mA, dI _F /dt=100A/μs		9		ns
Reverse Recovery Charge	Q _{rr}			2.3		nC
Dynamic Characteristics						
Input Capacitance	C _{iss}	V _{DS} =-16V,V _{GS} =0V,f=1MHz		36		pF
Output Capacitance	C _{oss}			11		
Reverse Transfer Capacitance	C _{rss}			5.8		
Total Gate Charge	Q _g	V _{DS} =-10V,V _{GS} =-4.5V,I _D =-1A		1.3		nC
Gate-Source Charge	Q _{gs}			0.4		
Gate-Drain Charge	Q _{gd}			0.2		
Turn-On Delay Time	t _{d(on)}	V _{DD} =-10V,V _{GS} =-4.5V, R _G =10Ω, I _D =-0.5A		6		ns
Turn-On Rise Time	t _r			6		
Turn-Off Delay Time	t _{d(off)}			11		
Turn-Off Fall Time	t _f			6		

Curve Characteristics (N-Channel)

Fig.1 - Typical Output Characteristics

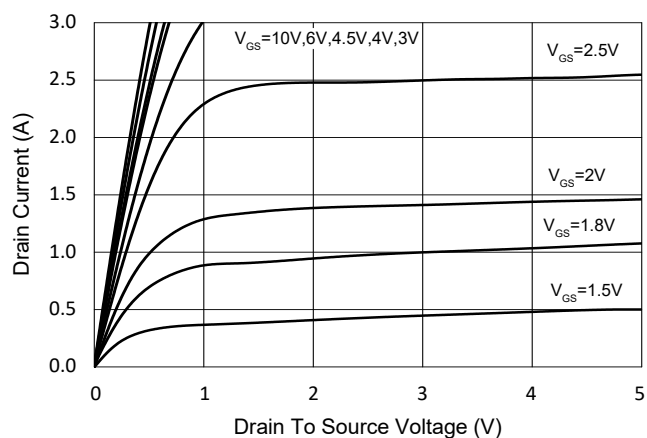


Fig.2 - Transfer Characteristic

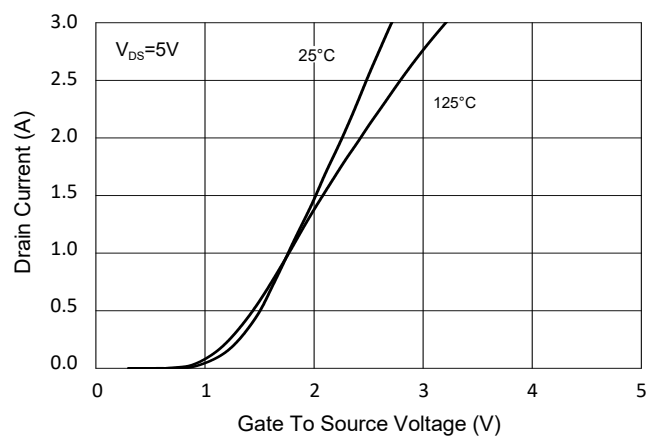


Fig.3 - $R_{DS(ON)} - V_{GS}$

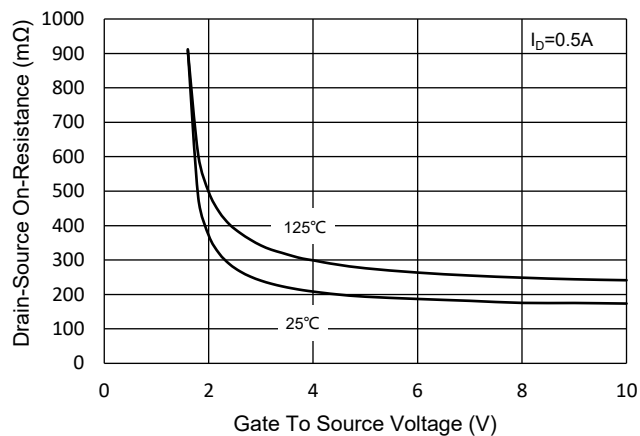


Fig.4 - $R_{DS(ON)} - I_D$

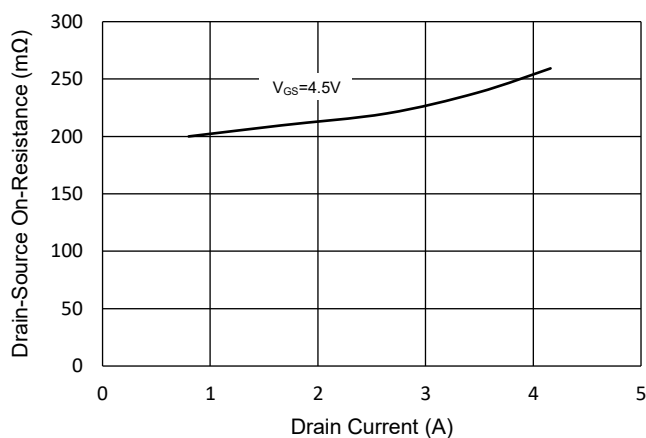


Fig.5 - Capacitance Characteristics

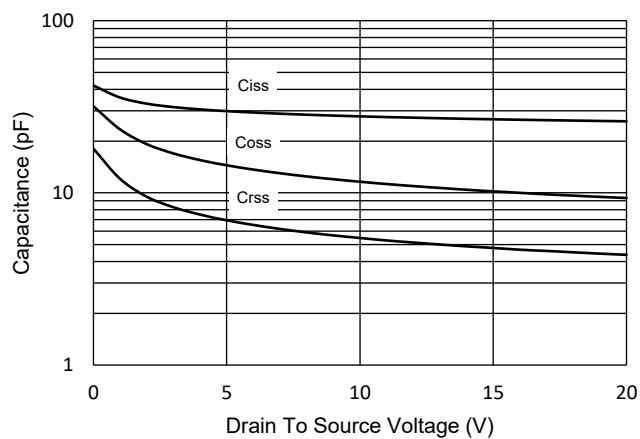
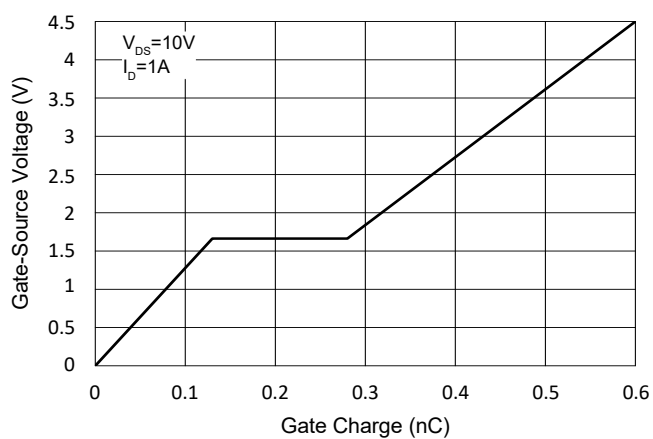


Fig.6 - Gate Charge



Curve Characteristics (N-Channel)

Fig.7 - Normalized Threshold Voltage

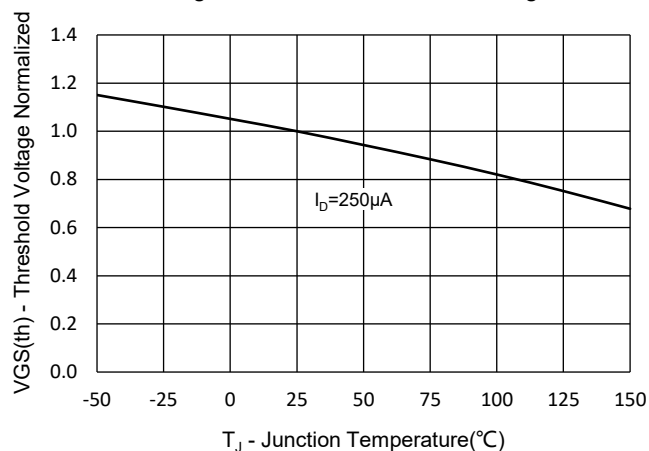


Fig.8 - Normalized On Resistance Characteristics

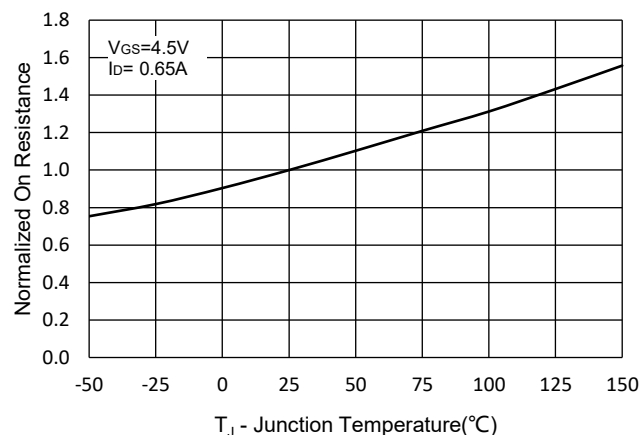


Fig.9 - $I_S - V_{SD}$

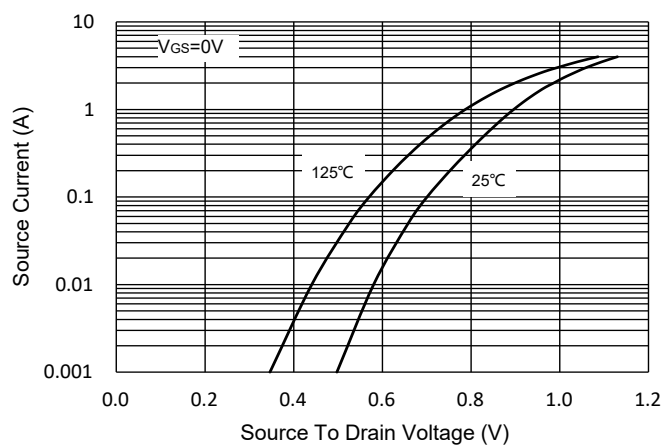


Fig.10 - Drain Current

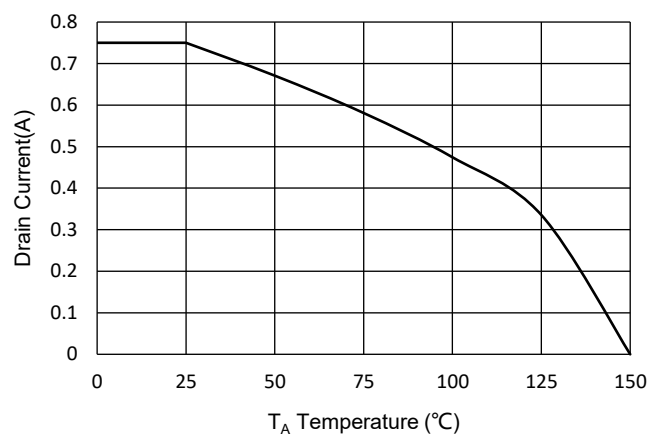
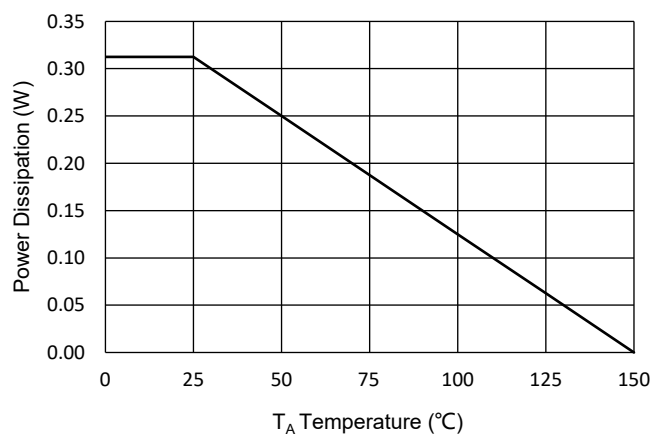


Fig.11 - PD Dissipation



Curve Characteristics (N-Channel)

Fig.12 - Safe Operation Area

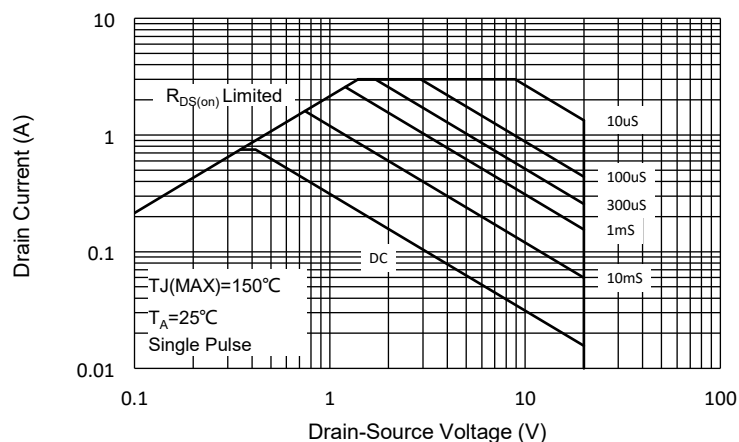
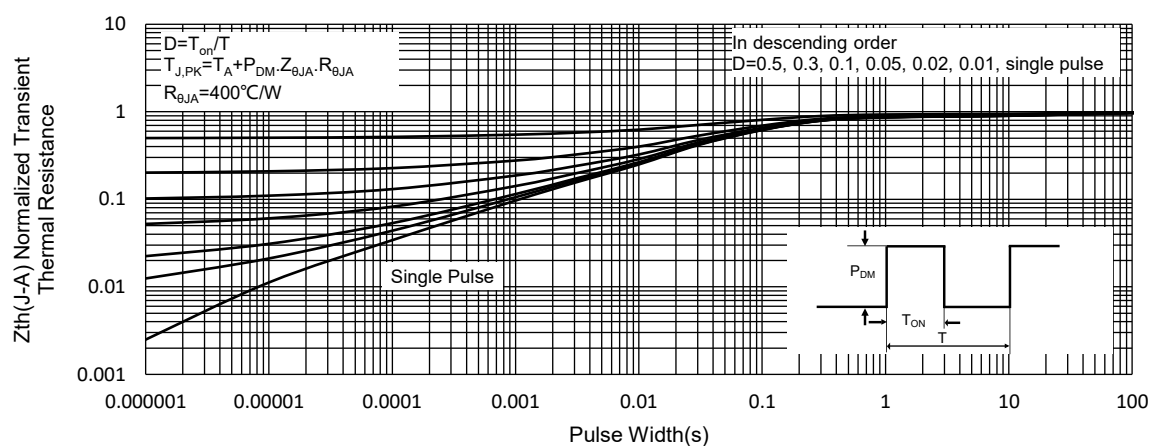


Fig.13 - Normalized Transient Thermal Impedance



Curve Characteristics (P-Channel)

Fig.1 - Typical Output Characteristics

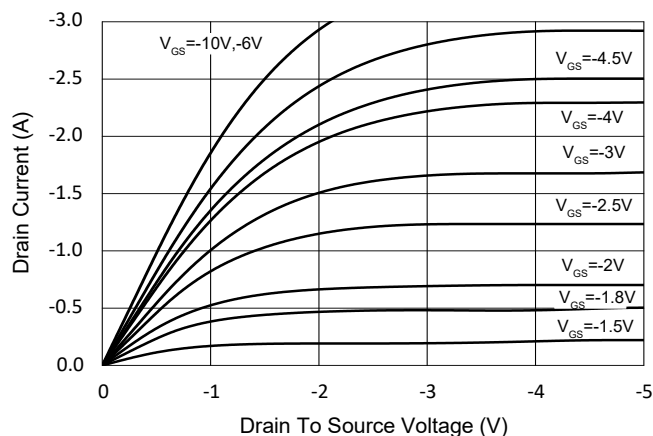


Fig.2 - Transfer Characteristic

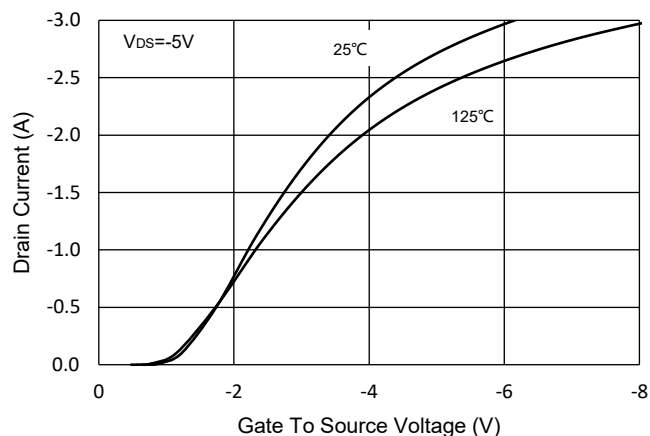


Fig.3 - $R_{DS(ON)}$ - V_{GS}

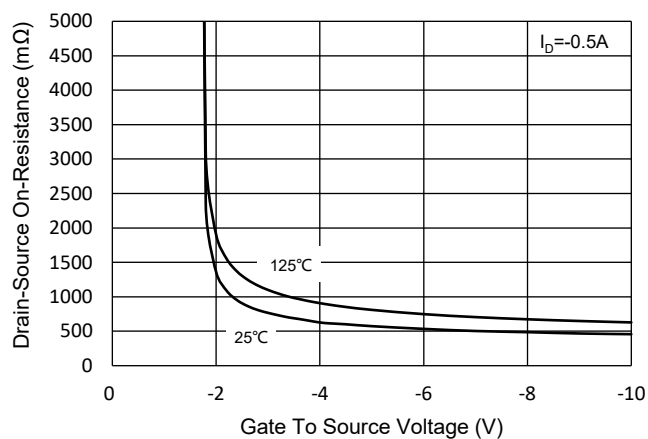


Fig.4 - $R_{DS(ON)}$ - I_D

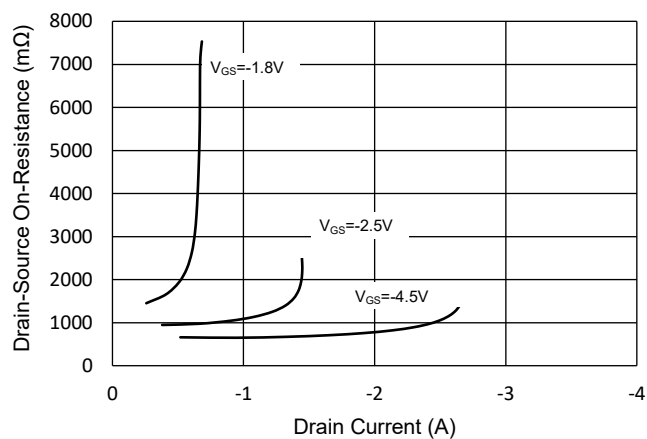


Fig.5 - Capacitance Characteristics

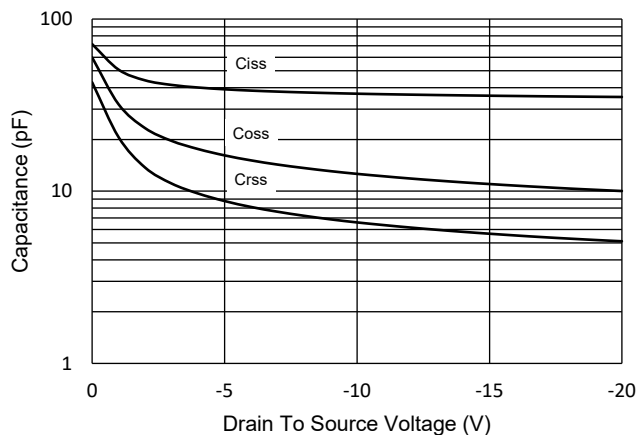
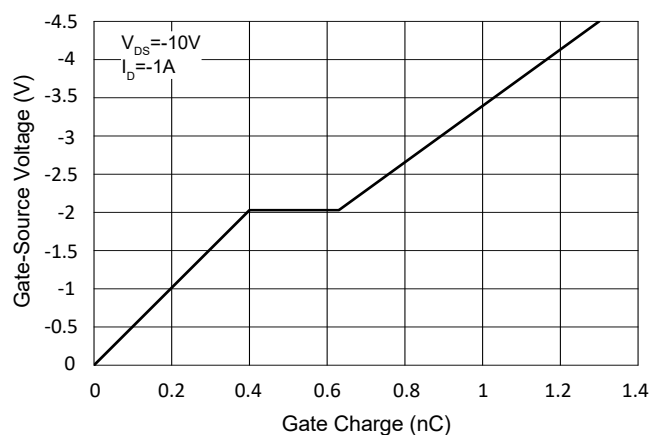


Fig.6 - Gate Charge



Curve Characteristics (P-Channel)

Fig.7 - Normalized Threshold Voltage

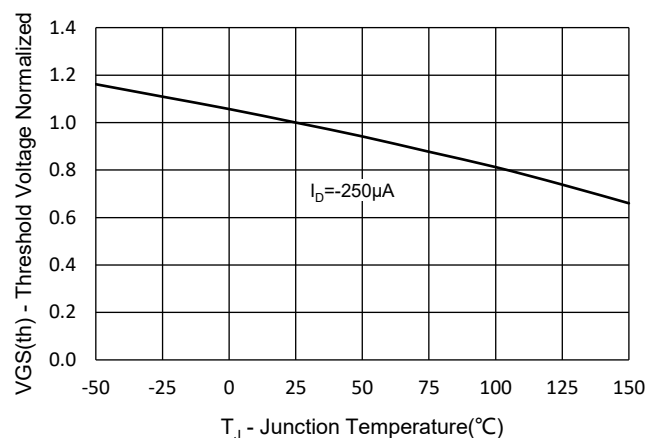


Fig.8 - Normalized On Resistance Characteristics

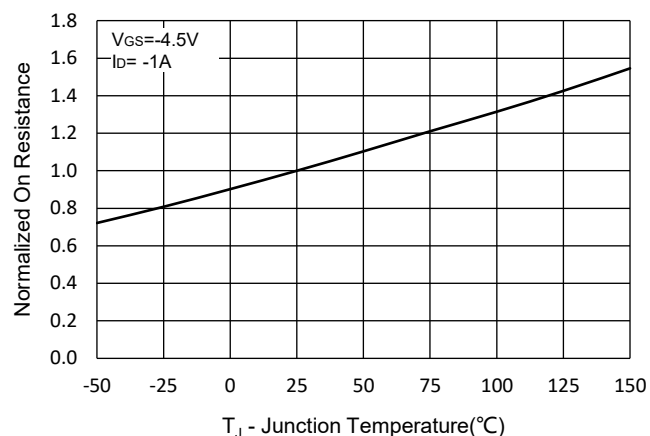


Fig.9 - I_S - V_{SD}

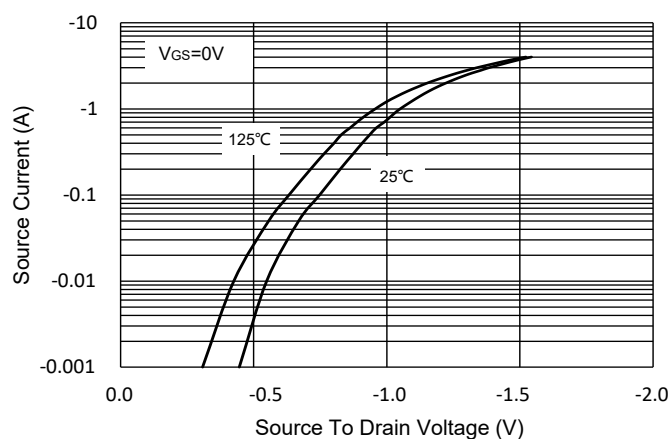


Fig.10 - Drain Current

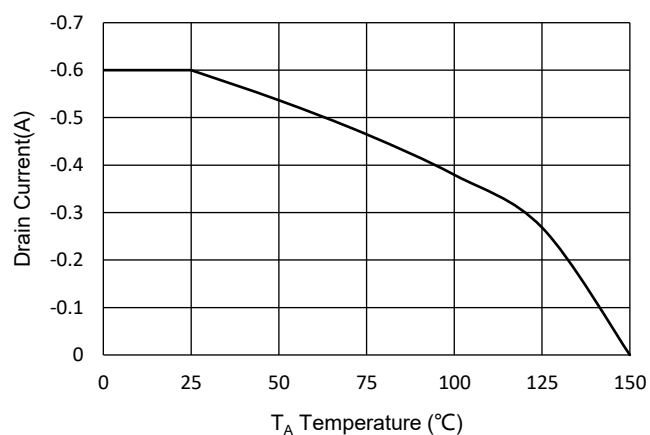
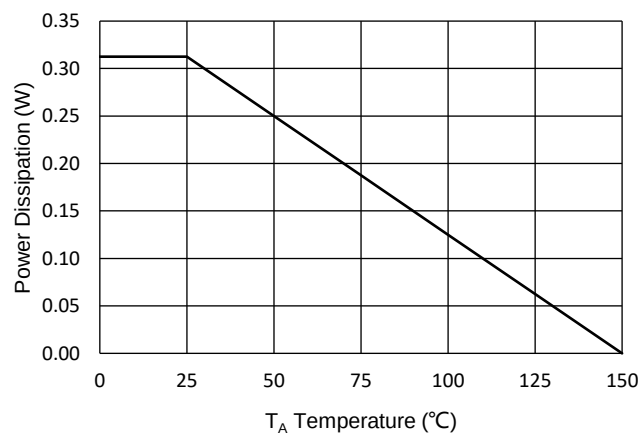


Fig.11 Power Dissipation



Curve Characteristics (P-Channel)

Fig.12 - Safe Operation Area

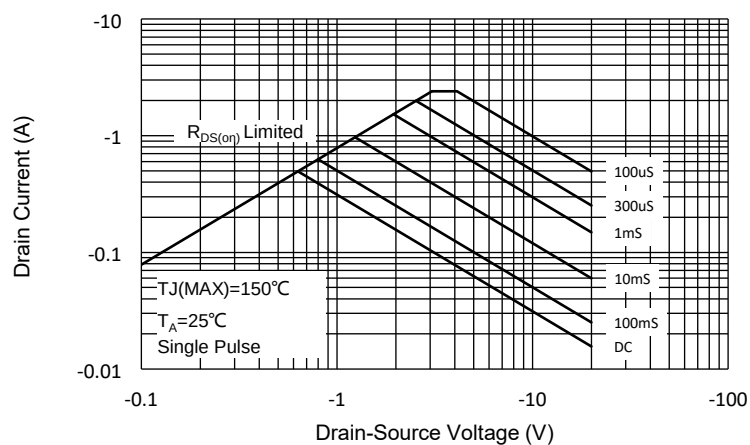
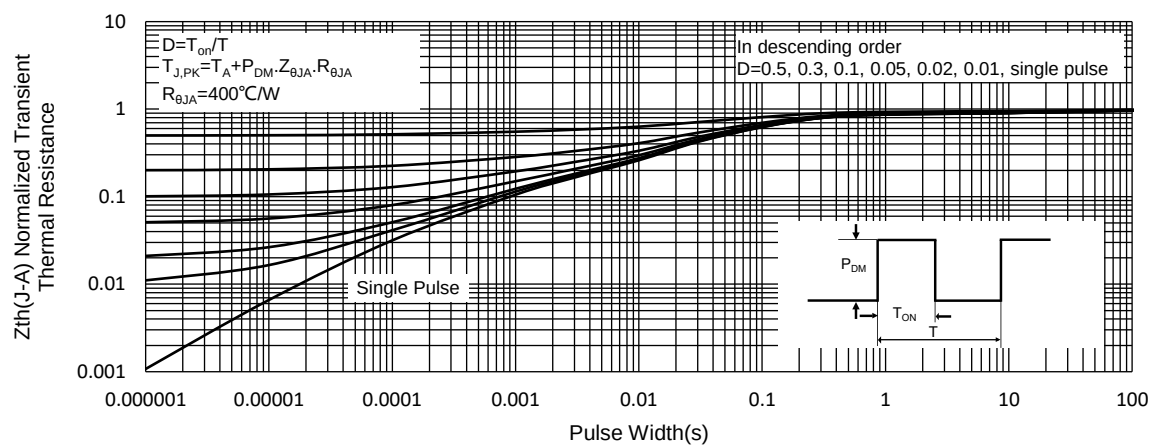


Fig.13 - Normalized Transient Thermal Impedance



Ordering Information

Device	Packing
Part Number-TP	Tape&Reel:3Kpcs/Reel
Part Number-TPQ2	Tape&Reel:3Kpcs/Reel

For packaging details, go to our website at <https://www.mccsemi.com/pdf/ProductPackaging/SOT-563%20Package.pdf>

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