

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

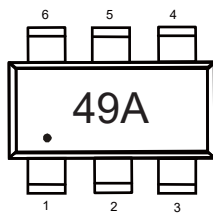
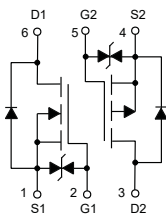
- Operating Junction Temperature Range : -55°C to +150°C
- Storage Temperature Range: -55°C to +150°C
- Thermal Resistance: 400°C/W Junction to Ambient (Note 2)

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	$T_A=25^\circ\text{C}$	0.75	A
	$T_A=100^\circ\text{C}$	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	$T_A=25^\circ\text{C}$	-0.6	A
	$T_A=100^\circ\text{C}$	-0.38	
Pulsed Drain Current (Note 3)	I_{DM}	-2.4	A

Note:

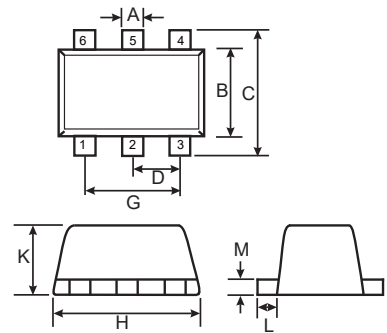
1. Halogen free "Green" products are defined as those which contain <900ppm bromine, <900ppm chlorine (<1500ppm total Br + Cl) and <1000ppm antimony compounds.
2. The value of $R_{\theta JA}$ is measured with the device mounted on 1in² FR-4 board with 2oz. Copper, in a still air environment with $T_A=25^\circ\text{C}$.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



DIM	DIMENSIONS				NOTE
	INCHES		MM		
	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	$V_{(BR)DSS}$	$V_{GS}=0V, I_D=250\mu A$	20			V
Gate-Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=250\mu A$	0.5	0.74	1.1	V
Gate-Body Leakage Current	I_{GSS}	$V_{GS}=\pm 10V, V_{DS}=0V$			± 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	m Ω
		$V_{GS}=2.5V, I_D=400mA$		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}	$I_F=380mA, di_F/dt=100A/\mu s$		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	$t_{d(on)}$	$V_{DD}=10V, V_{GS}=4.5V, R_G=10\Omega, I_D=500mA$		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	$V_{(BR)DSS}$	$V_{GS}=0V, I_D=-250\mu A$	-20			V
Gate-Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=-250\mu A$	-0.5	-0.65	-1.1	V
Gate-Body Leakage Current	I_{GSS}	$V_{GS}=\pm 10V, V_{DS}=0V$			± 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}	$I_F=-380mA, dI_F/dt=100A/\mu s$		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	$t_{d(on)}$	$V_{DD}=-10V, V_{GS}=-4.5V, R_G=10\Omega, I_D=-0.5A$		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

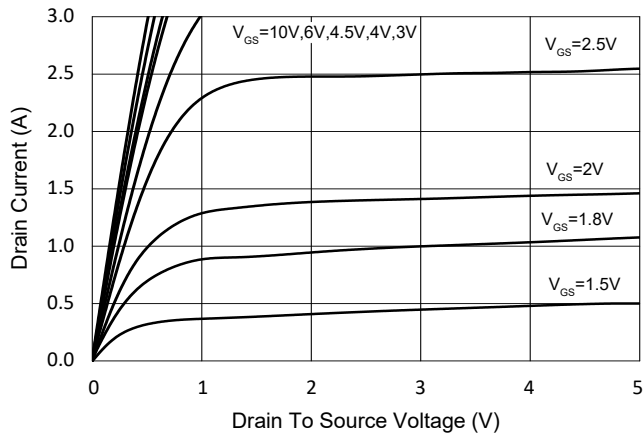


Fig.2 - Transfer Characteristic

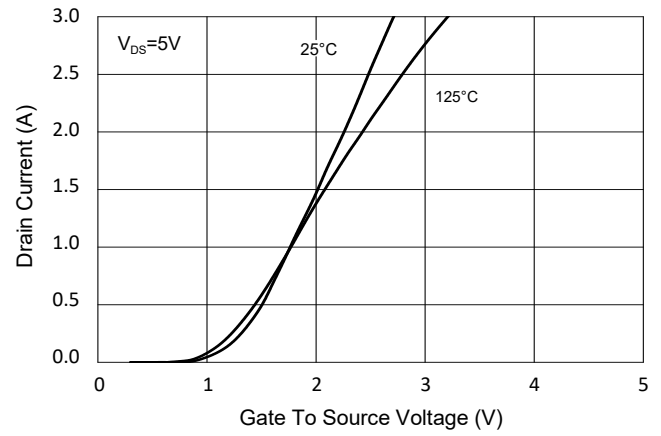


Fig.3 - $R_{DS(ON)}$ - V_{GS}

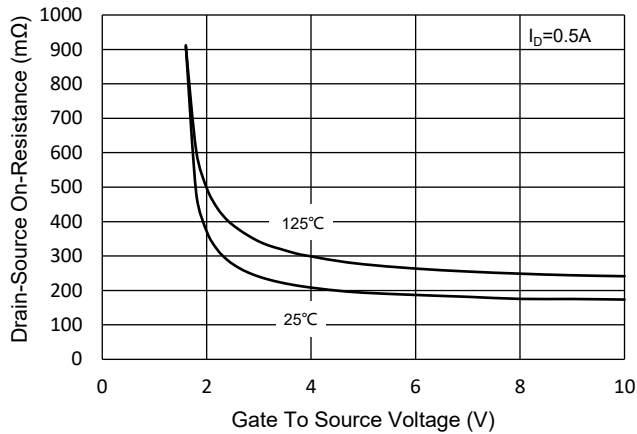


Fig.4 - $R_{DS(ON)}$ - I_D

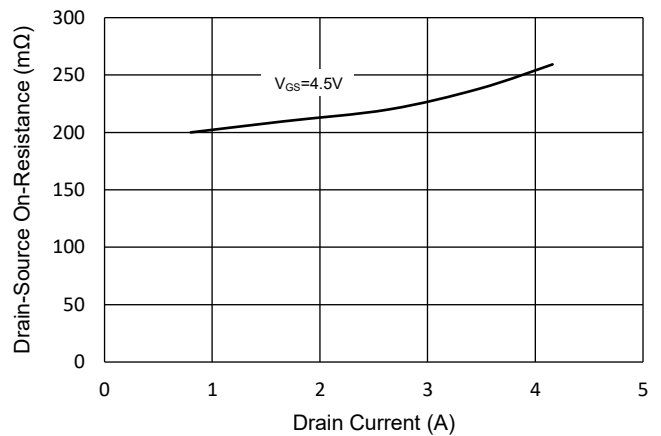


Fig.5 - Capacitance Characteristics

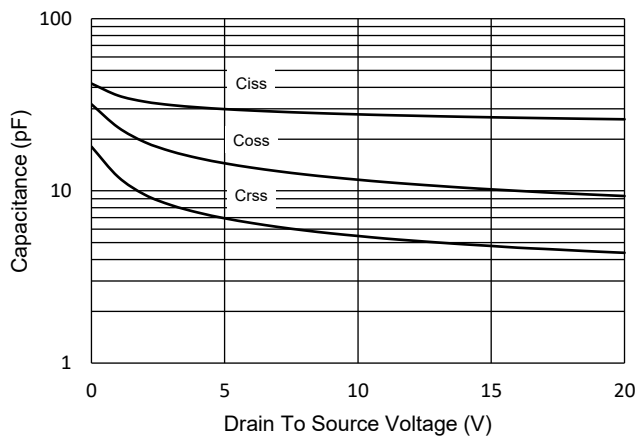
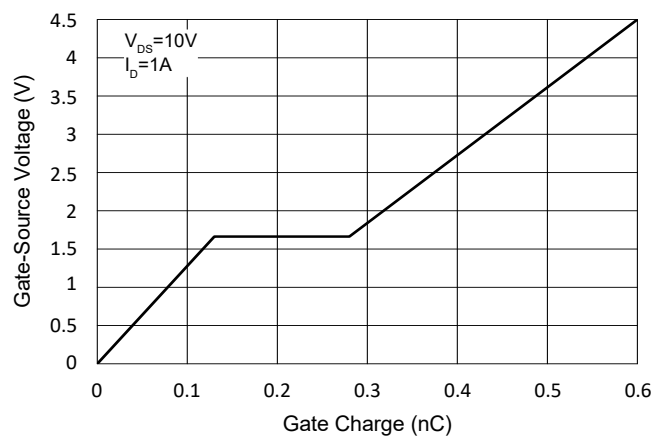


Fig.6 - Gate Charge



Curve Characteristics (N-Channel)

Fig.7 - Normalized Threshold Voltage

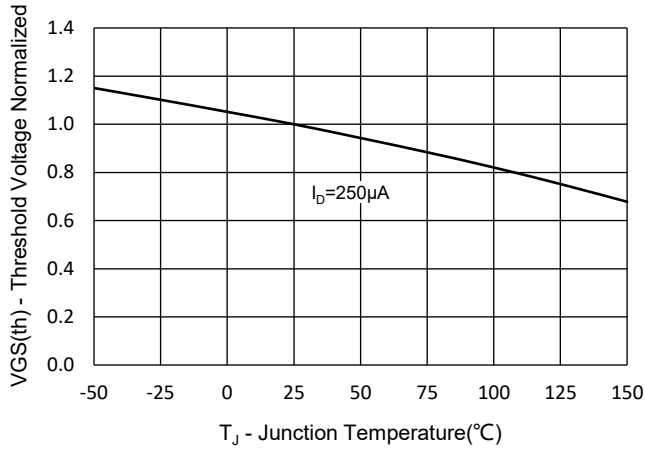


Fig.8 - Normalized On Resistance Characteristics

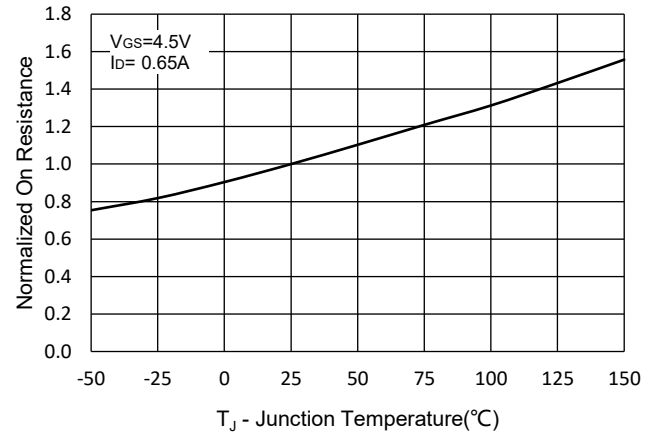


Fig.9 - $I_S - V_{SD}$

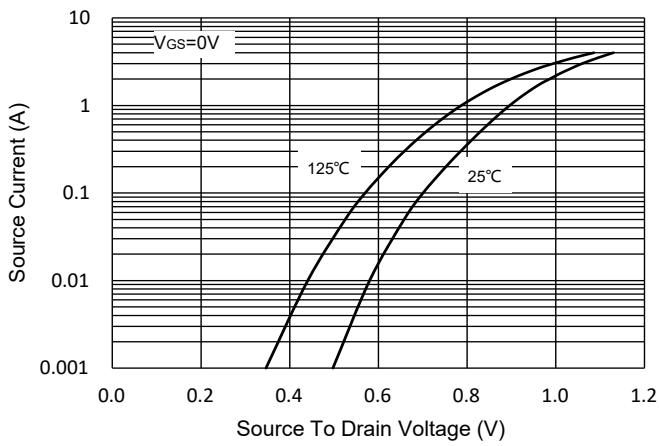


Fig.10 - Drain Current

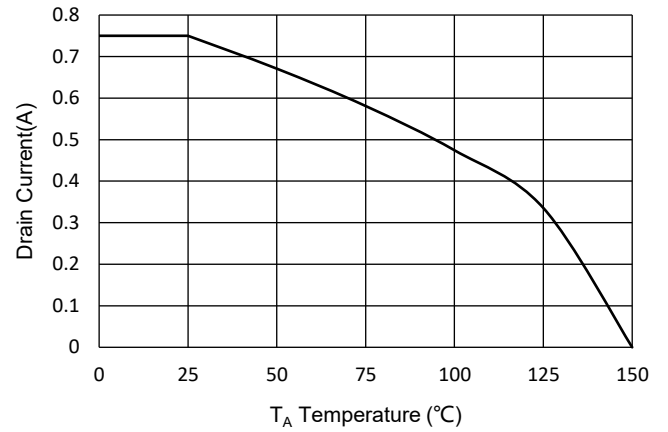
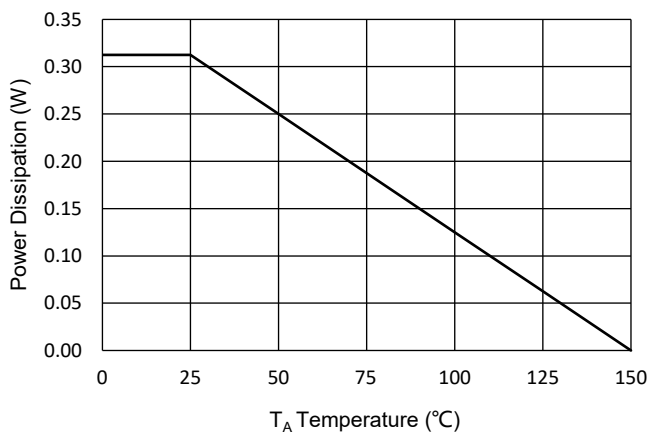


Fig.11 - PD Dissipation



Curve Characteristics (N-Channel)

Fig.12 - Safe Operation Area

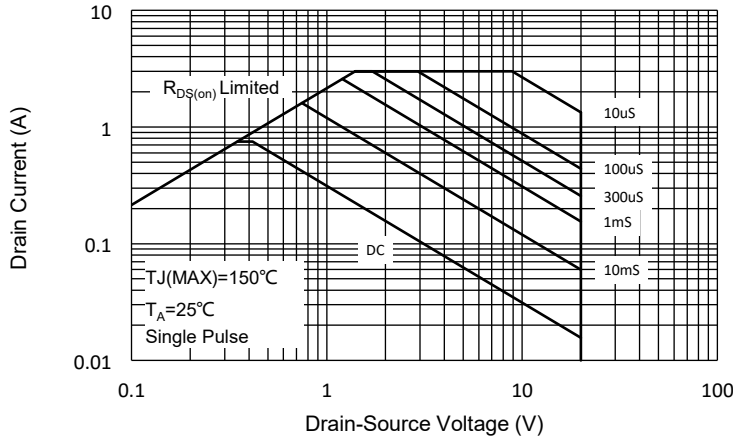
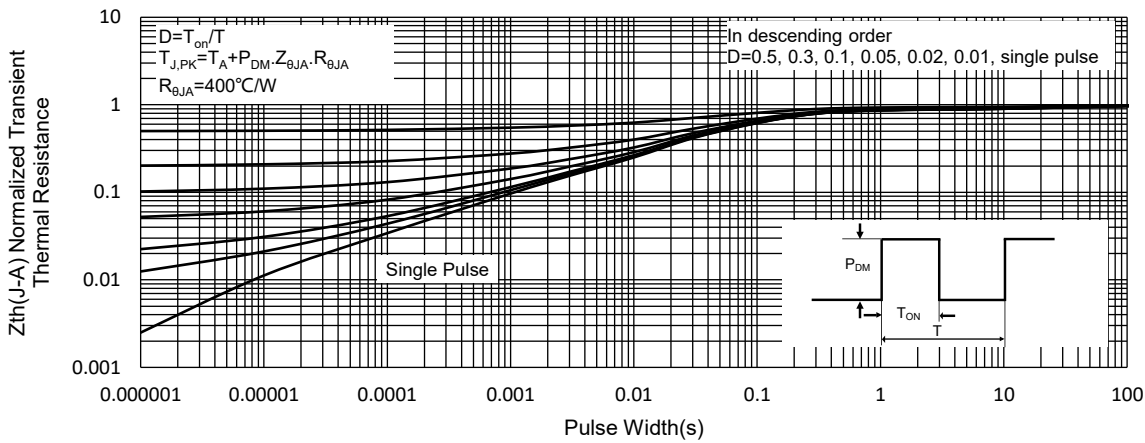


Fig.13 - Normalized Transient Thermal Impedance



Curve Characteristics (P-Channel)

Fig.1 - Typical Output Characteristics

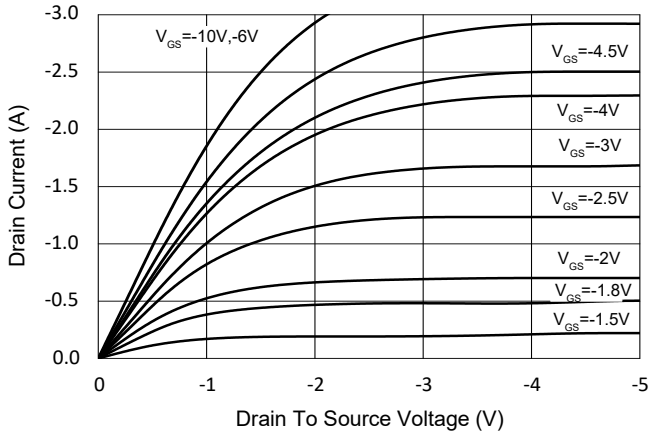


Fig.2 - Transfer Characteristic

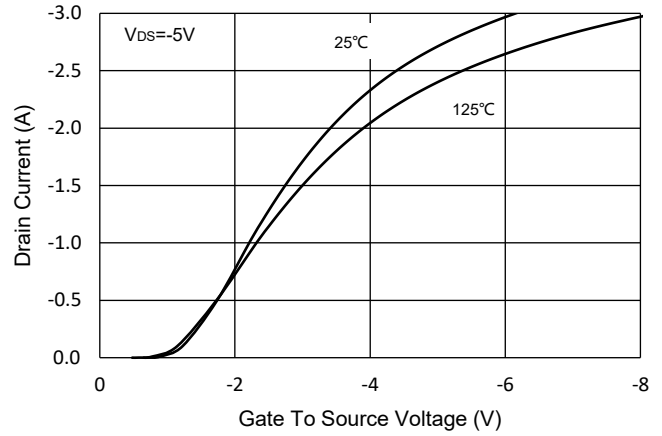


Fig.3 - $R_{DS(ON)}$ - V_{GS}

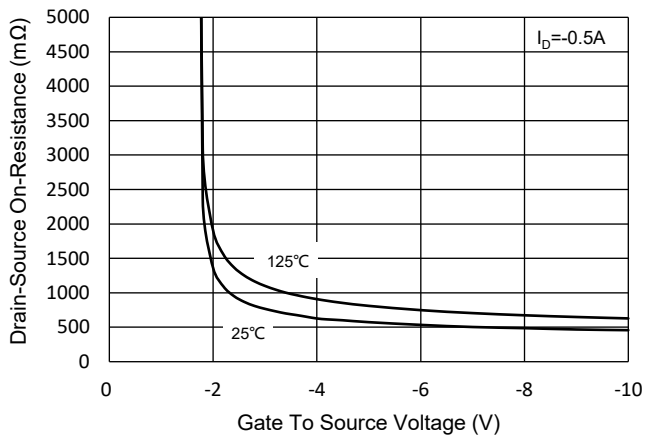


Fig.4 - $R_{DS(ON)}$ - I_D

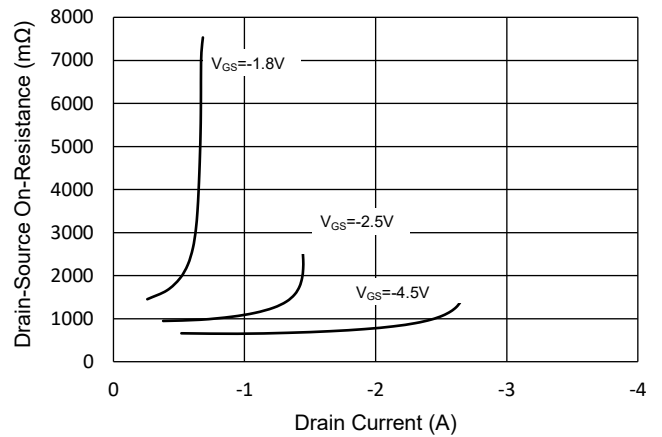


Fig.5 - Capacitance Characteristics

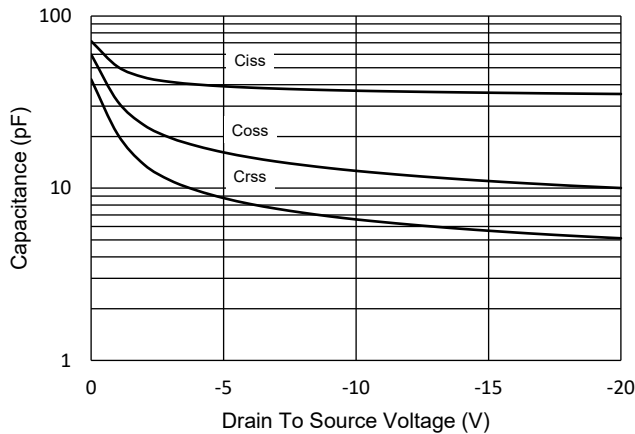
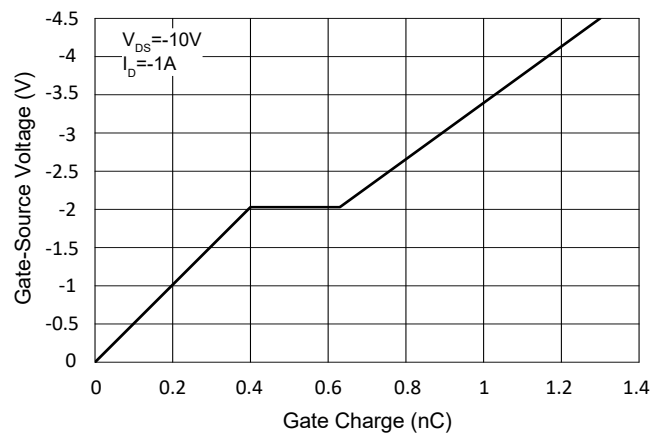


Fig.6 - Gate Charge



Curve Characteristics (P-Channel)

Fig.7 - Normalized Threshold Voltage

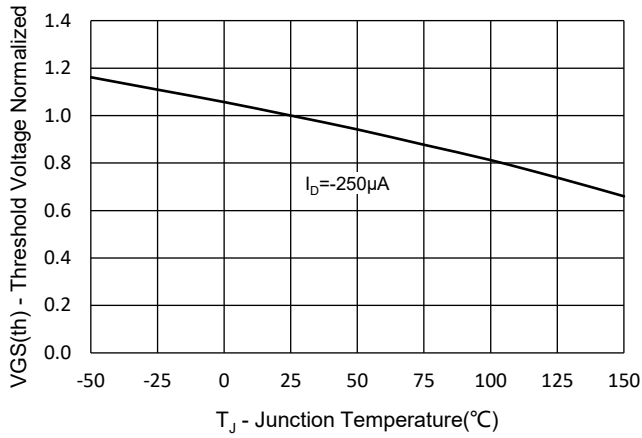


Fig.8 - Normalized On Resistance Characteristics

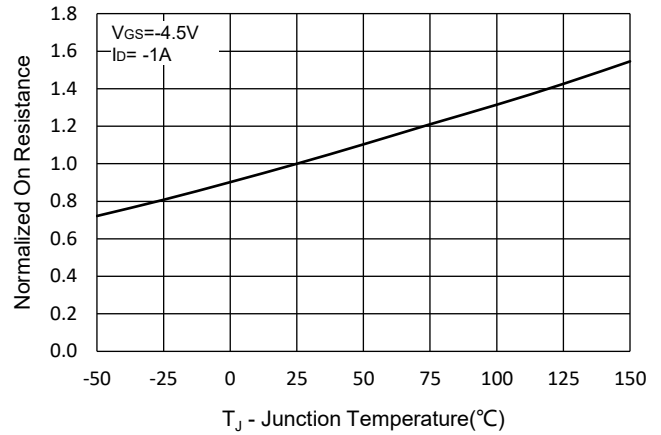


Fig.9 - I_S - V_{SD}

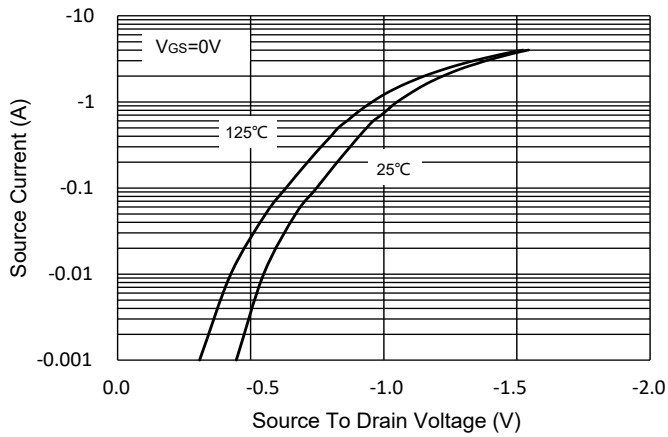


Fig.10 - Drain Current

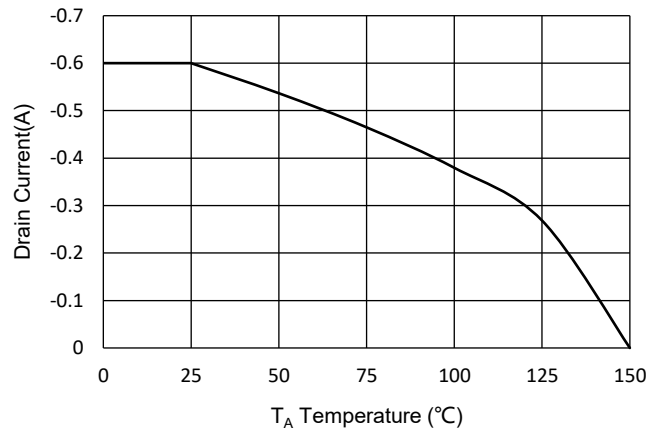
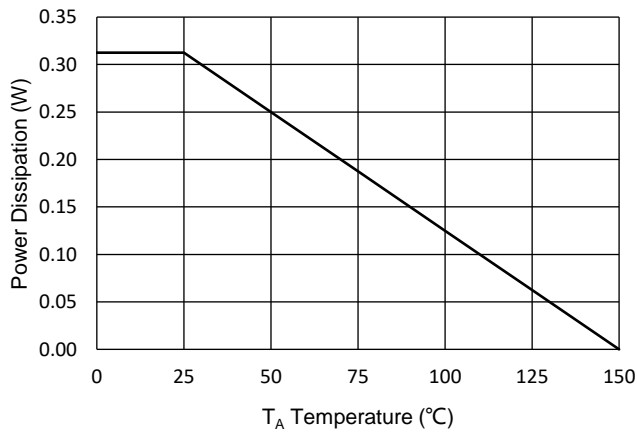


Fig.11 Power Dissipation



Curve Characteristics (P-Channel)

Fig.12 - Safe Operation Area

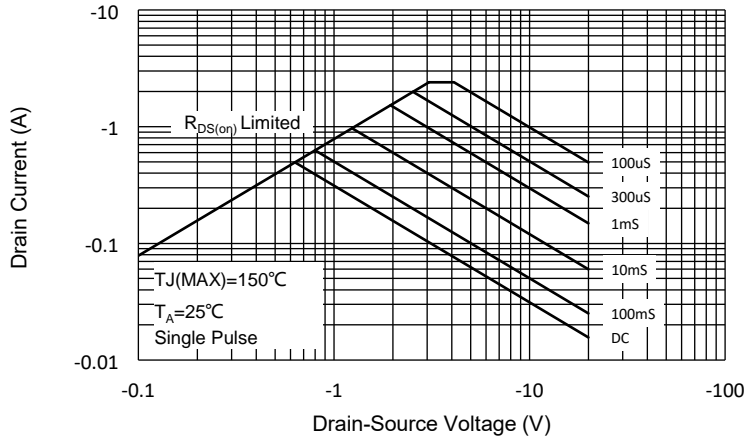
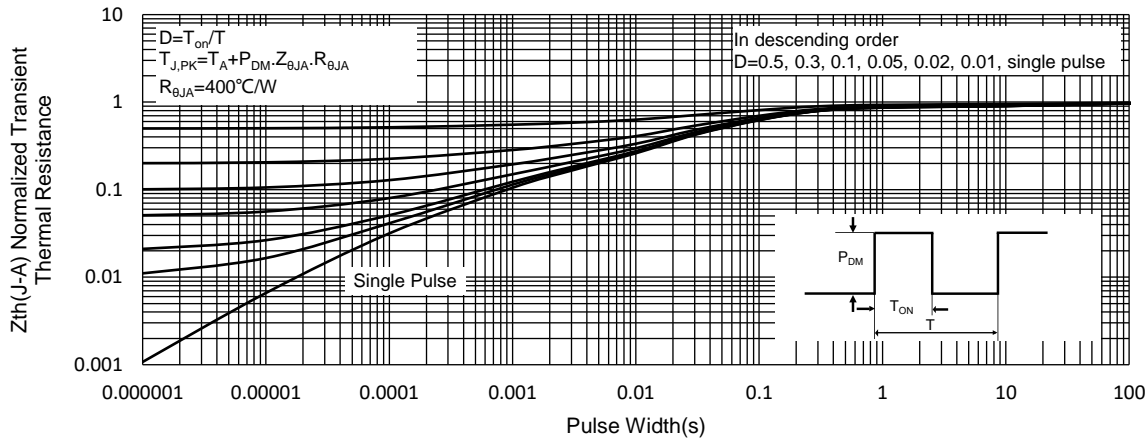


Fig.13 - Normalized Transient Thermal Impedance



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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