

Features

- 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

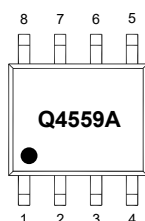
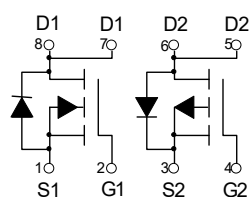
- Operating Junction Temperature Range : -55°C to +150°C
- Storage Temperature Range: -55°C to +150°C
- Thermal Resistance: 62.5°C/W Junction to Ambient (Note 2)

Parameter		Symbol	Rating	Unit
Total Power Dissipation ^(Note 4)		P _D	2.0	W
N-Channel MOSFET				
Drain-Source Voltage		V _{DS}	60	V
Gate-Source Voltage		V _{GS}	±20	V
Continuous Drain Current	T _A =25°C	I _D	4.5	A
	T _A =100°C		2.8	
Pulsed Drain Current ^(Note 3)		I _{DM}	18	A
Single Pulsed Avalanche Energy ^(Note 5)		E _{AS}	24	mJ
P-Channel MOSFET				
Drain-Source Voltage		V _{DS}	-60	V
Gate-Source Voltage		V _{GS}	±20	V
Continuous Drain Current	T _A =25°C	I _D	-3.5	A
	T _A =100°C		-2.2	
Pulsed Drain Current ^(Note 3)		I _{DM}	-14	A
Single Pulsed Avalanche Energy ^(Note 6)		E _{AS}	24	mJ

Note:

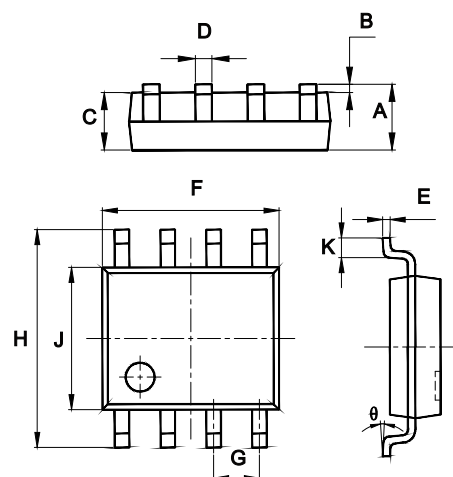
- Halogen free "Green" products are defined as those which contain <900ppm bromine, <900ppm chlorine (<1500ppm total Br + Cl) and <1000ppm antimony compounds.
- The value of $R_{\theta JA}$ is measured with the device mounted on 1in² FR-4 board with 2oz. Copper, in a still air environment with $T_A=25^\circ\text{C}$.
- Repetitive rating; pulse width limited by max. junction temperature.
- P_D is based on max. junction temperature, using junction-ambient thermal resistance.
- $T_J=25^\circ\text{C}$, $V_{DD}=25\text{V}$, $R_G=25\Omega$, $V_G=10\text{V}$, $L=0.5\text{mH}$.
- $T_J=25^\circ\text{C}$, $V_{DD}=-25\text{V}$, $R_G=25\Omega$, $V_G=-10\text{V}$, $L=0.5\text{mH}$.

Internal Structure and Marking Code



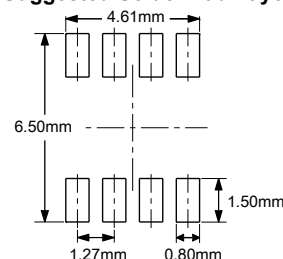
Dual N&P-Channel MOSFET

SOP-8



DIM	INCHES		MM		NOTE
	MIN	MAX	MIN	MAX	
A	0.053	0.069	1.35	1.75	
B	0.004	0.010	0.10	0.25	
C	0.053	0.061	1.35	1.55	
D	0.013	0.020	0.33	0.51	
E	0.007	0.010	0.17	0.25	
F	0.185	0.200	4.70	5.10	
G	0.050		1.270		TYP.
H	0.228	0.244	5.80	6.20	
J	0.150	0.157	3.80	4.00	
K	0.016	0.050	0.40	1.27	
θ	0°	8°	0°	8°	

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			±100	nA
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	1.6	2.5	V
Drain-Source On-Resistance	R _{DS(on)}	V _{GS} =10V, I _D =4.3A		34	45	mΩ
		V _{GS} =4.5V, I _D =3.9A		40	50	
Gate Resistance	R _g	f=1MHz, Open drain		2		Ω
Diode Characteristics						
Continuous Body Diode Current	I _S				4.5	A
Diode Forward Voltage	V _{SD}	V _{GS} =0V, I _S =1.7A			1.3	V
Reverse Recovery Time	t _{rr}	I _F =10A, dI/dt=100A/μs		22		ns
Reverse Recovery Charge	Q _{rr}			14		nC
Dynamic Characteristics						
Input Capacitance	C _{iss}	V _{DS} =25V, V _{GS} =0V, f=1MHz		822		pF
Output Capacitance	C _{oss}			53		
Reverse Transfer Capacitance	C _{rss}			48		
Total Gate Charge	Q _g	V _{DS} =30V, V _{GS} =10V, I _D =10A		19.5		nC
Gate-Source Charge	Q _{gs}			3		
Gate-Drain Charge	Q _{gd}			4.8		
Turn-On Delay Time	t _{d(on)}	V _{DD} =30V, V _{GS} =10V, R _G =2.2Ω, I _D =10A		6.7		ns
Turn-On Rise Time	t _r			31		
Turn-Off Delay Time	t _{d(off)}			21.7		
Turn-Off Fall Time	t _f			2.6		

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	-60			V
Gate-Source Leakage Current	I _{GSS}	V _{DS} =0V, V _{GS} =±10V			±100	nA
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	-1.8	-2.5	V
Drain-Source On-Resistance	R _{DS(on)}	V _{GS} =-10V, I _D =-3.1A		65	80	mΩ
		V _{GS} =-4.5V, I _D =-3.1A		90	115	
Gate Resisitance	R _g	f=1MHz, Open drain		3		Ω
Diode Characteristics						
Continuous Body Diode Current	I _S				-3.5	A
Diode Forward Voltage	V _{SD}	V _{GS} =0V, I _S =-2A			-1.2	V
Reverse Recovery Time	t _{rr}	I _S =-6A,di/dt=100A/μs		18.6		ns
Reverse Recovery Charge	Q _{rr}			14		nC
Dynamic Characteristics						
Input Capacitance	C _{iss}	V _{DS} =-10V,V _{GS} =0V,f=1MHz		2992		pF
Output Capacitance	C _{oss}			330		
Reverse Transfer Capacitance	C _{rss}			272		
Total Gate Charge	Q _g	V _{DS} =-30V,V _{GS} =-4.5V,I _D =-3.1A		4.4		nC
Gate-Source Charge	Q _{gs}			1.9		
Gate-Drain Charge	Q _{gd}			1		
Turn-On Delay Time	t _{d(on)}	V _{DD} =-30V, V _{GS} =-10V, R _G =1Ω, I _D =-2.4A		14		ns
Turn-On Rise Time	t _r			11		
Turn-Off Delay Time	t _{d(off)}			15		
Turn-Off Fall Time	t _f			5.3		

N-Channel MOSFET Curve Characteristics

Fig. 1 - Typical Output Characteristics

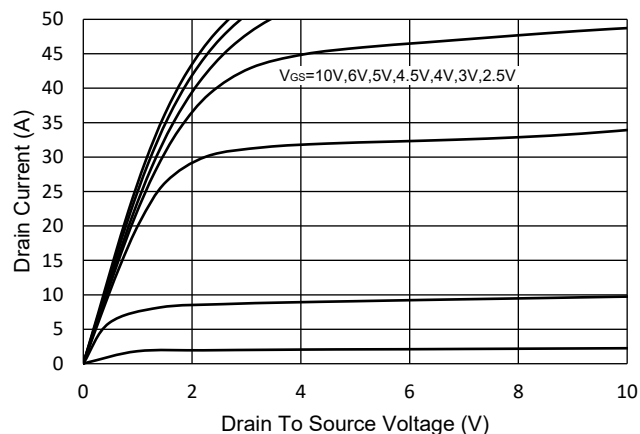


Fig.2 - Transfer Characteristic

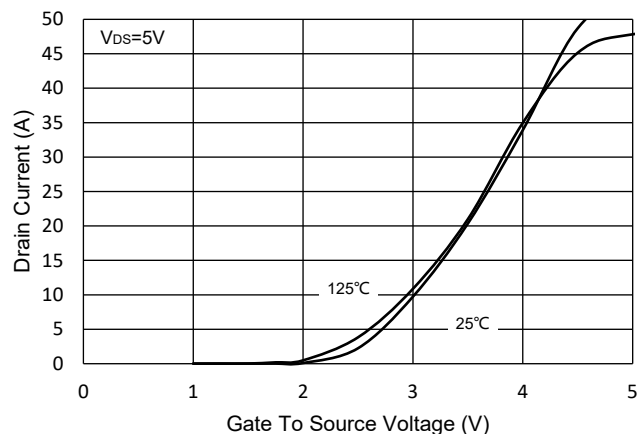


Fig.3 - $R_{DS(ON)}$ - V_{GS}

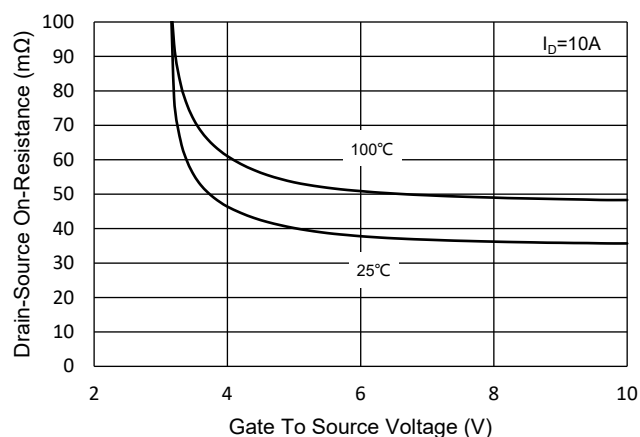


Fig.4 - $R_{DS(ON)}$ - I_D

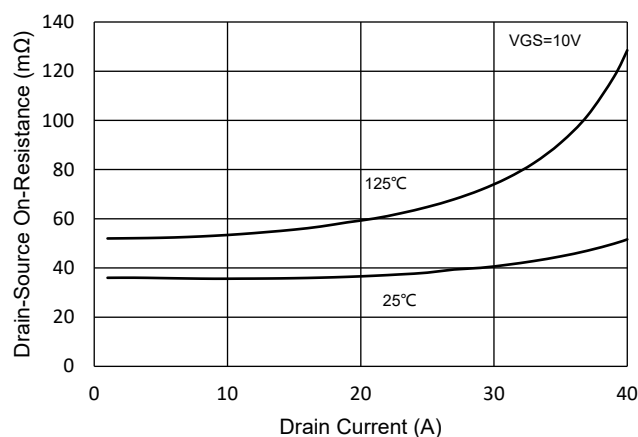


Fig.5 - Capacitance Characteristics

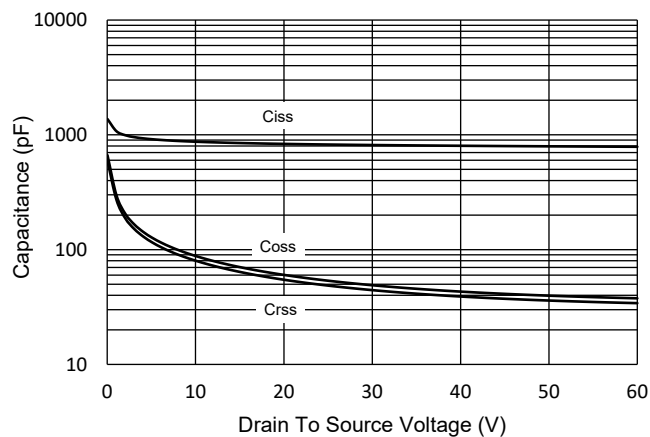
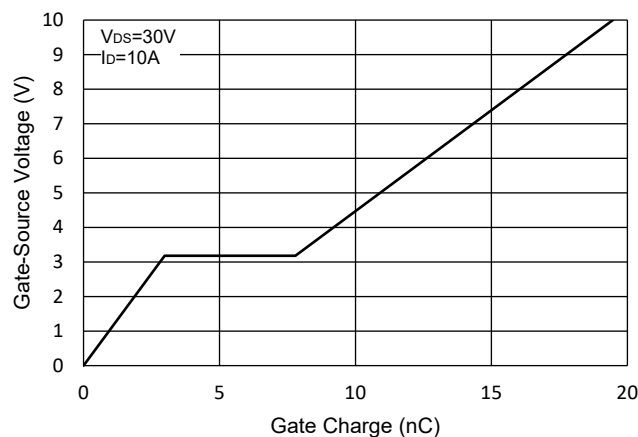


Fig.6 - Gate Charge



N-Channel MOSFET Curve Characteristics

Fig.7 - Normalized Threshold Voltage

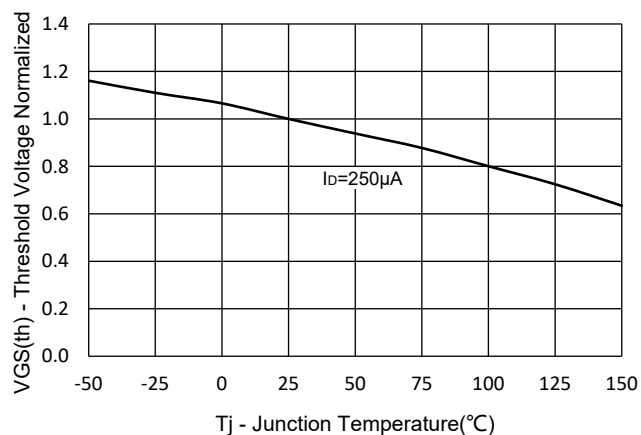


Fig.8 - Normalized On Resistance Characteristics

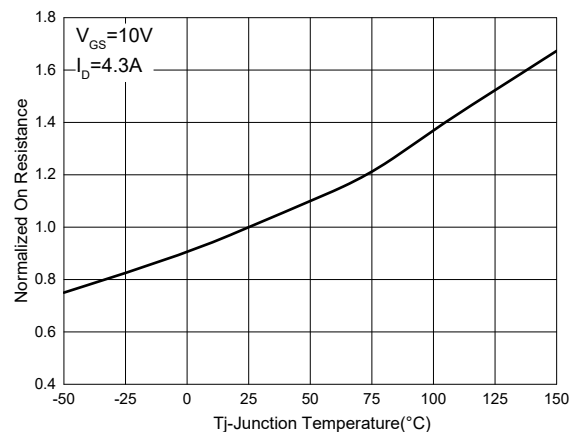


Fig.9 - $I_S - V_{SD}$

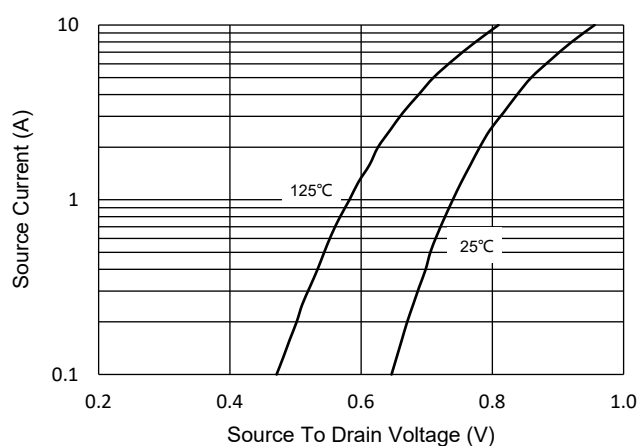


Fig.10 - Drain Current

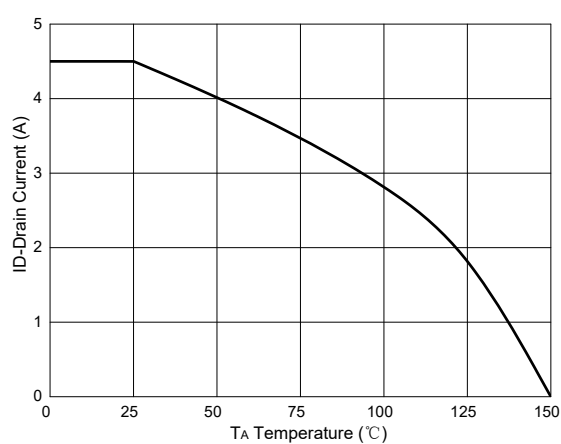
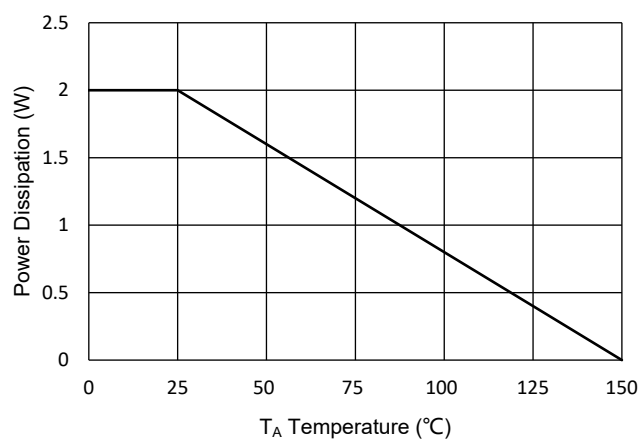


Fig.11 - PD Dissipation



N-Channel MOSFET Curve Characteristics

Fig.12 - Safe Operation Area

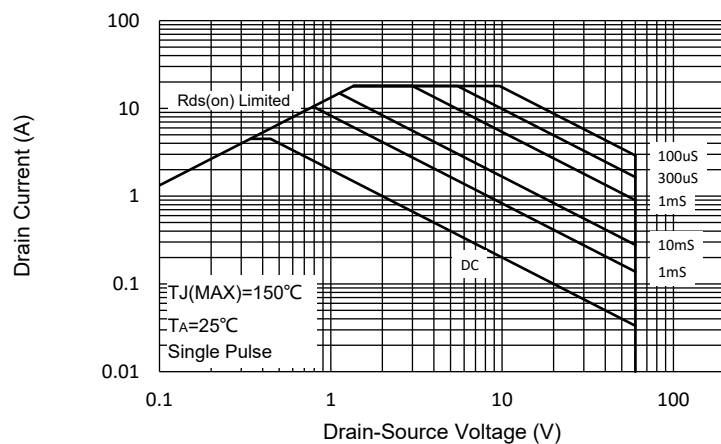
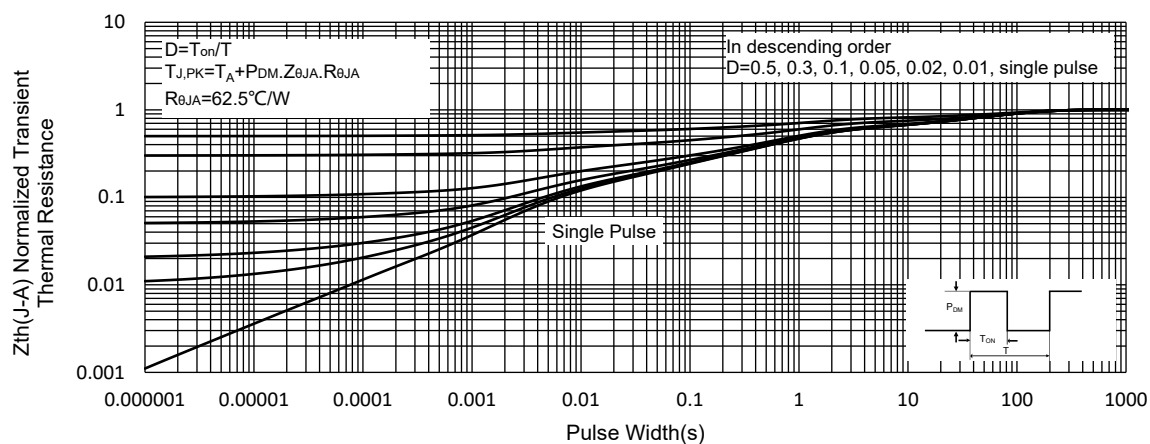


Fig.13 - Normalized Transient Thermal Impedance



P-Channel MOSFET Curve Characteristics

Fig. 1 - Typical Output Characteristics

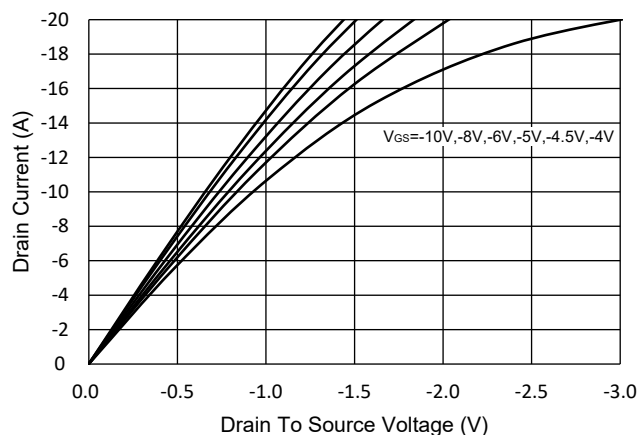


Fig.2 - Transfer Characteristic

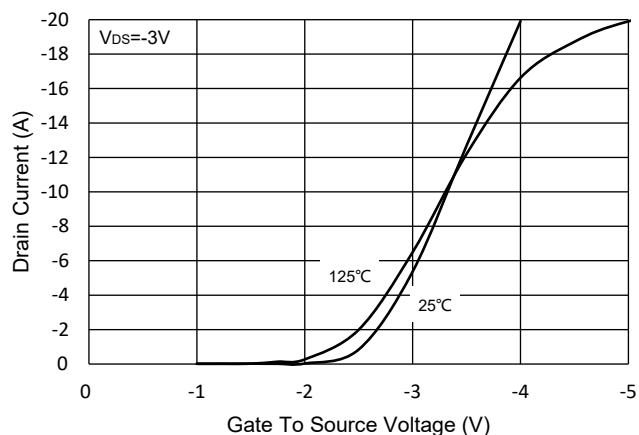


Fig.3 - $R_{DS(ON)}$ - V_{GS}

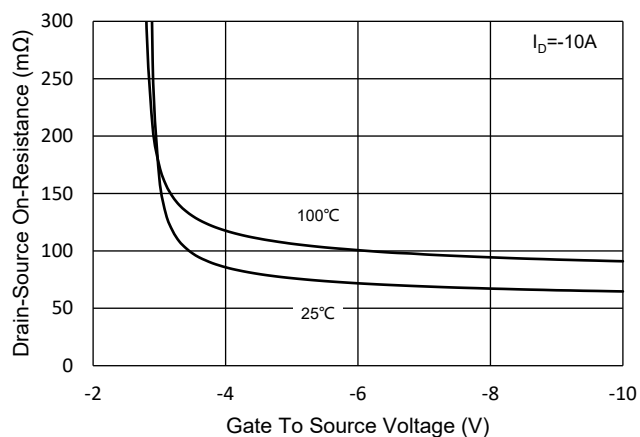


Fig.4 - $R_{DS(ON)}$ - I_D

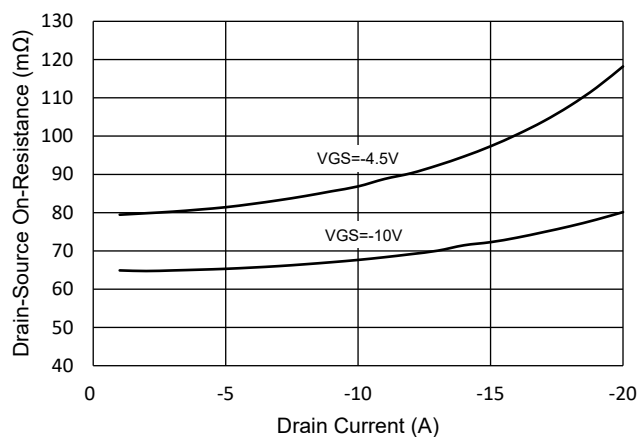


Fig.5 - Capacitance Characteristics

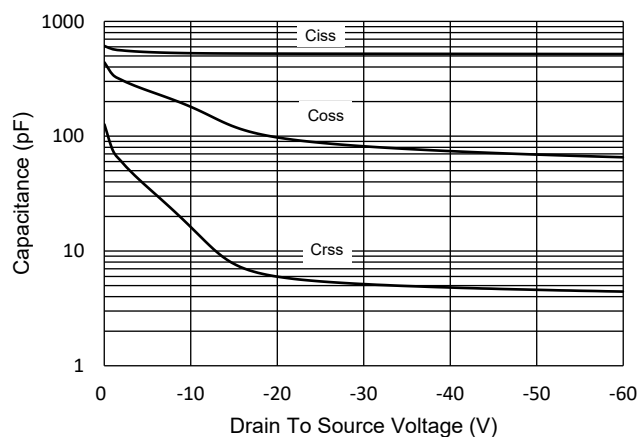
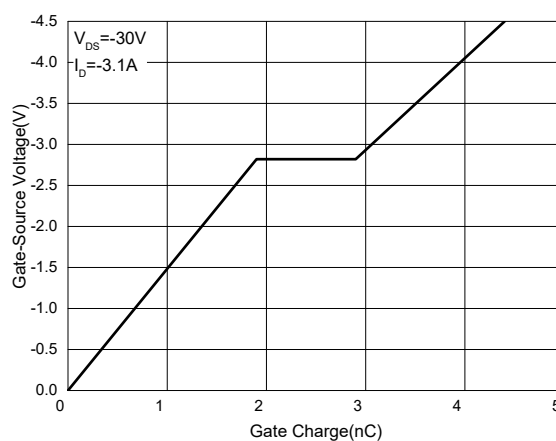


Fig. 6 - Gate Charge



P-Channel MOSFET Curve Characteristics

Fig.7 - Normalized Threshold Voltage

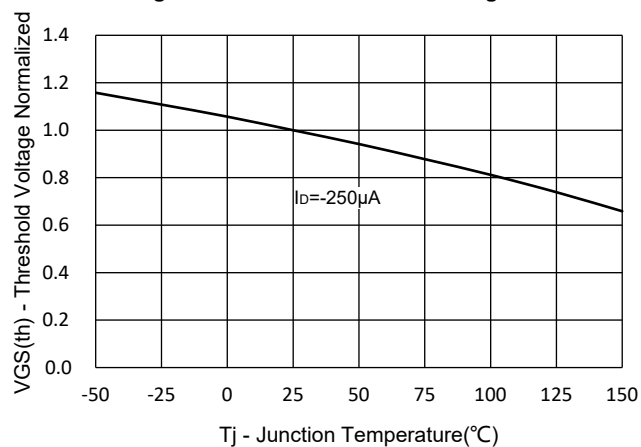


Fig.8 - Normalized On Resistance Characteristics

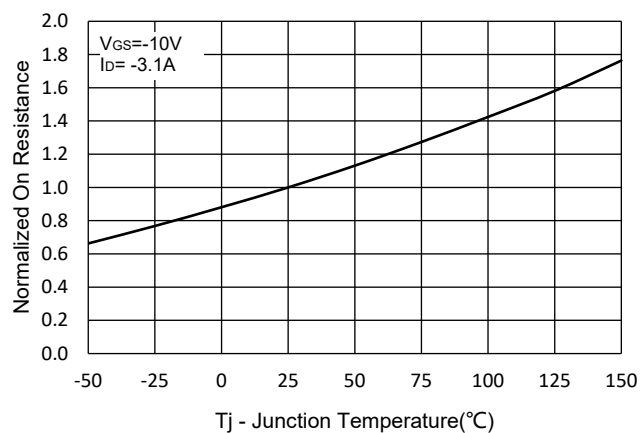


Fig.9 - $I_S - V_{SD}$

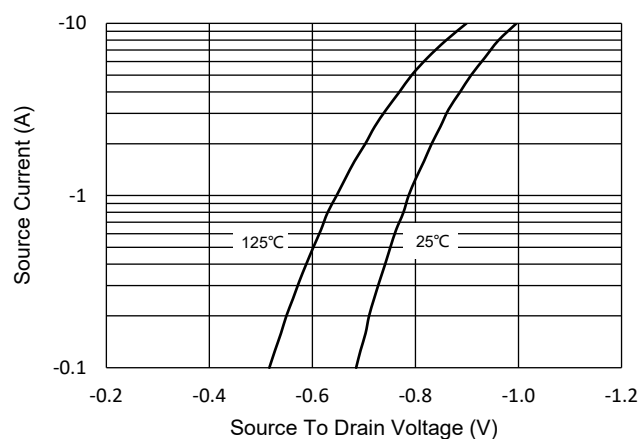


Fig.10 - Drain Current

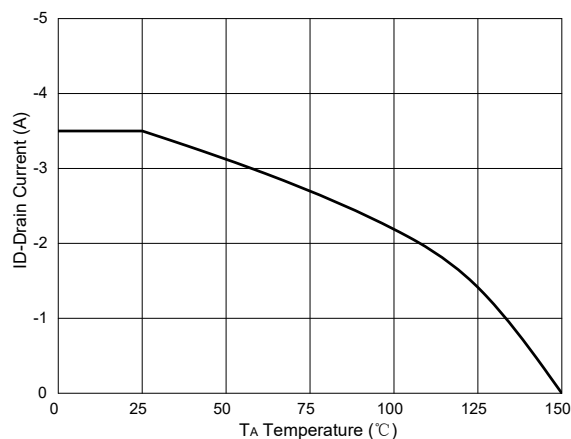
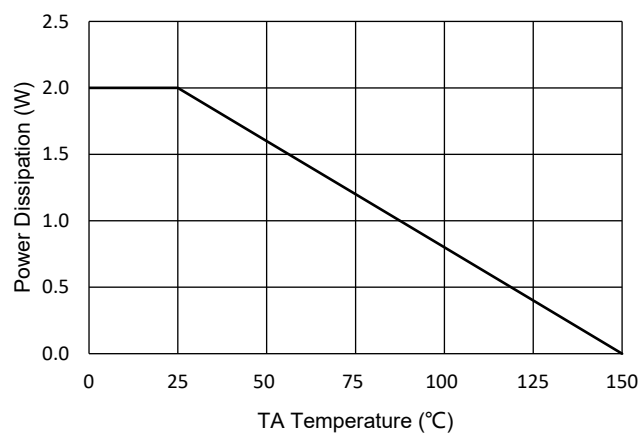


Fig.11 - PD Dissipation



P-Channel MOSFET Curve Characteristics

Fig.12 - Safe Operation Area

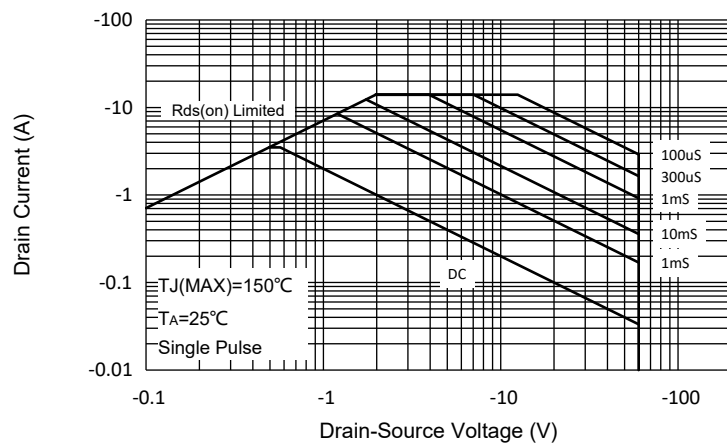
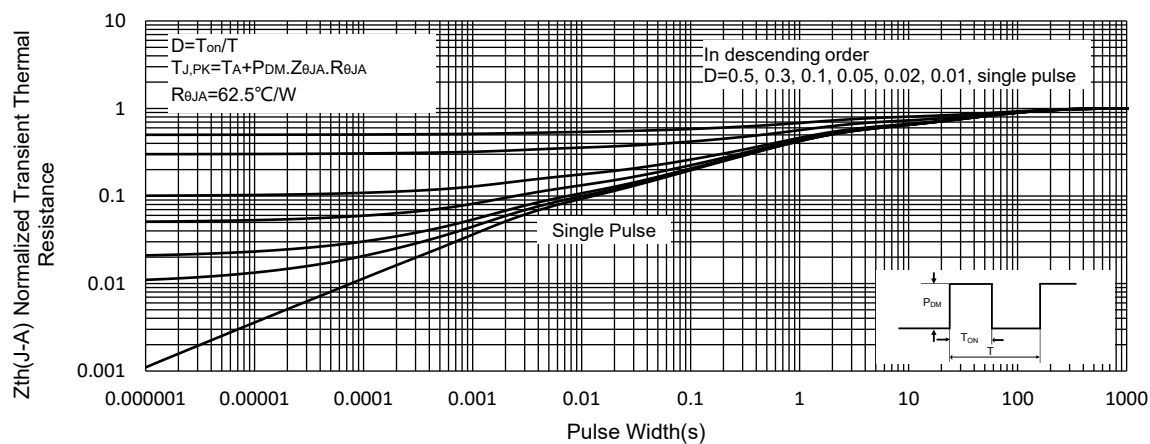


Fig.13 - Normalized Transient Thermal Impedance



Ordering Information

Device	Packing
Part Number-TP	Tape&Reel: 4Kpcs/Reel

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