Features

- Trench MOSFET Technology
- 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)

Dual N&P Channel Power MOSFET

Maximum Ratings

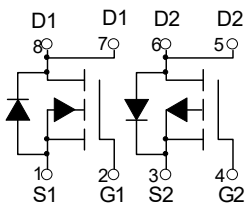
- Operating Junction Temperature Range : -55°C to +150°C
- Storage Temperature Range: -55°C to +150°C
- N-Channel Thermal Resistance: 60°C/W Junction to Ambient(Note 2)
- P-Channel Thermal Resistance: 55°C/W Junction to Ambient(Note 2)

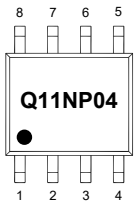
Parameter		Symbol	Rating	Unit
N-Channel MOSFET				
Drain-Source Voltage		V_{DS}	40	V
Gate-Source Volltage		V_{GS}	±20	V
Continuous Drain Current	T_A=25°C	I_D	11	A
	T_A=100°C		6.9	
Pulsed Drain Current(Note3)		I_{DM}	44	A
Total Power Dissipation(Note4)		P_D	2.1	W
Single Pulsed Avalanche Energy(Note5)		E_{AS}	15	mJ
P-Channel MOSFET				
Drain-Source Voltage		V_{DS}	-40	V
Gate-Source Volltage		V_{GS}	±20	V
Continuous Drain Current	T_A=25°C	I_D	-11	A
	T_A=100°C		-6.9	
Pulsed Drain Current(Note3)		I_{DM}	-44	A
Total Power Dissipation(Note4)		P_D	2.3	W
Single Pulsed Avalanche Energy(Note5)		E_{AS}	45	mJ

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^2 FR-4 board with 2oz. Copper, in a still air environment with T_A =25°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.
5. NMOS:V_{DD}=40V, V_{GS}=10V, L=1mH.
   PMOS:V_{DD}=-40V,V_{GS}=-10V,L=1mH.

Internal Structure and Marking Code





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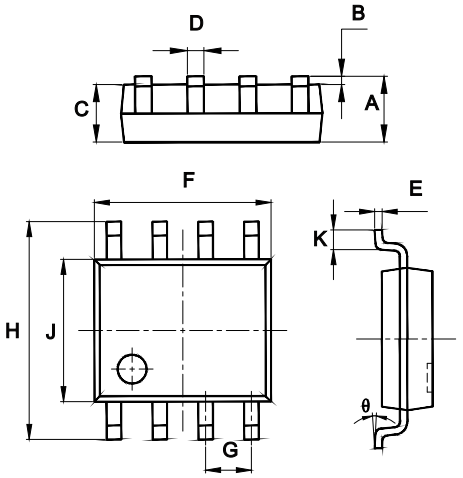
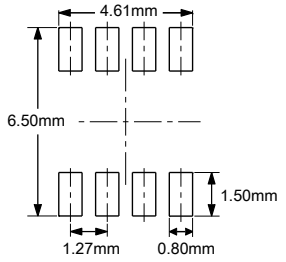


DIMENSIONS					
DIM	INCHES		MM		NOTE
	MIN	MAX	MIN	MAX	
A	0.053	0.069	1.35	1.75	
B	0.004	0.010	0.10	0.25	
C	0.053	0.061	1.35	1.55	
D	0.013	0.020	0.33	0.51	
E	0.007	0.010	0.17	0.25	
F	0.185	0.200	4.70	5.10	
G	0.050		1.270		TYP.
H	0.228	0.244	5.80	6.20	
J	0.150	0.157	3.80	4.00	
K	0.016	0.050	0.40	1.27	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

Suggested Solder Pad Layout



N-Channel 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	40			V
Gate-Source Leakage Current	I_{GSS}	V_{DS}=0V, V_{GS} =±20V			±100	nA
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS}=40V, 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=7A		24	32	mΩ
		V_{GS}=4.5V, I_D=5A		33	50	
Gate Resistance	R_g	f=1 MHz, Open drain		2		Ω
Forward Transconductance	g_{fs}	V_{DS}=5V,I_D=3.5A		9		S
Diode Characteristics						
Continuous Body Diode Current	I_S				11	A
Diode Forward Voltage	V_{SD}	V_{GS}=0V, I_S=11A			1.2	V
Reverse Recovery Time	t_{rr}	I_F=7A, di/dt=100A/us		26		ns
Reverse Recovery Charge	Q_{rr}			19		nC
Dynamic Characteristics						
Input Capacitance	C_{iss}	V_{DS}=20V,V_{GS}=0V,f=1MHz		390		pF
Output Capacitance	C_{oss}			50		
Reverse Transfer Capacitance	C_{rss}			40		
Total Gate Charge	Q_g	V_{DS}=20V,V_{GS}=10V,I_D=7A		11		nC
Gate-Source Charge	Q_{gs}			3.1		
Gate-Drain Charge	Q_{gd}			3		
Turn-On Delay Time	$t_{d(on)}$	V_{GS}=10V,V_{DD}=20V, I_D=7A, R_{GEN}=2.2Ω		6		ns
Turn-On Rise Time	t_r			20		
Turn-Off Delay Time	$t_{d(off)}$			12		
Turn-Off Fall Time	t_f			2		

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	-40			V
Gate-Source Leakage Current	I_{GSS}	V_{DS}=0V, V_{GS} =±20V			±100	nA
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS}=-40V, 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=-7A		25	33	mΩ
		V_{GS}=-4.5V, I_D=-5A		35	50	
Gate Resistance	R_g	f=1MHz, Open drain		15		Ω
Forward Transconductance	g_{fs}	V_{DS}=-5V,I_D=-5A		12		S
Diode Characteristics						
Continuous Body Diode Current	I_S				-11	A
Diode Forward Voltage	V_{SD}	V_{GS}=0V, I_S=-11A			-1.2	V
Reverse Recovery Time	t_{rr}	I_S=-10A, dI_F/dt=100A/μs		19		ns
Reverse Recovery Charge	Q_{rr}			9		nC
Dynamic Characteristics						
Input Capacitance	C_{iss}	V_{DS}=-20V,V_{GS}=0V,f=1MHz		1080		pF
Output Capacitance	C_{oss}			120		
Reverse Transfer Capacitance	C_{rss}			110		
Total Gate Charge	Q_g	V_{DS}=-20V,V_{GS}=-10V,I_D=-10A		17		nC
Gate-Source Charge	Q_{gs}			4.5		
Gate-Drain Charge	Q_{gd}			4		
Turn-On Delay Time	$t_{d(on)}$	V_{DD}=-20V, V_{GEN}=-10V, R_G=3Ω, I_{DS}=-10A		7		ns
Turn-On Rise Time	t_r			24		
Turn-Off Delay Time	$t_{d(off)}$			20		
Turn-Off Fall Time	t_f			16		

Curve Characteristics (N-Channel)

Fig. 1 - Typical Output Characteristics

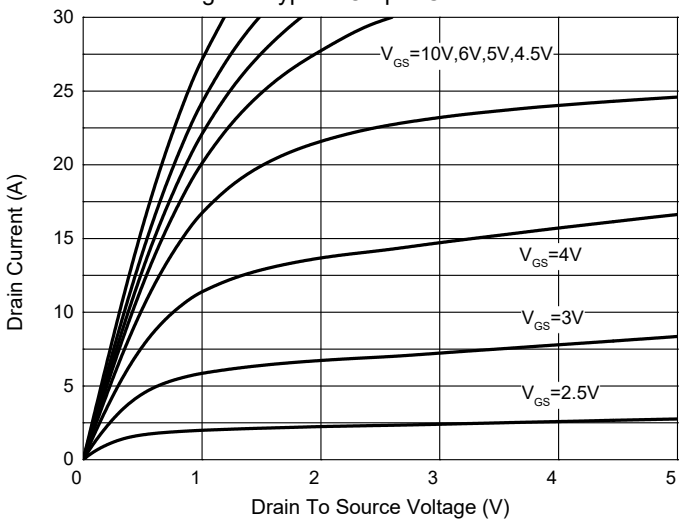


Fig. 2 - Transfer Characteristics

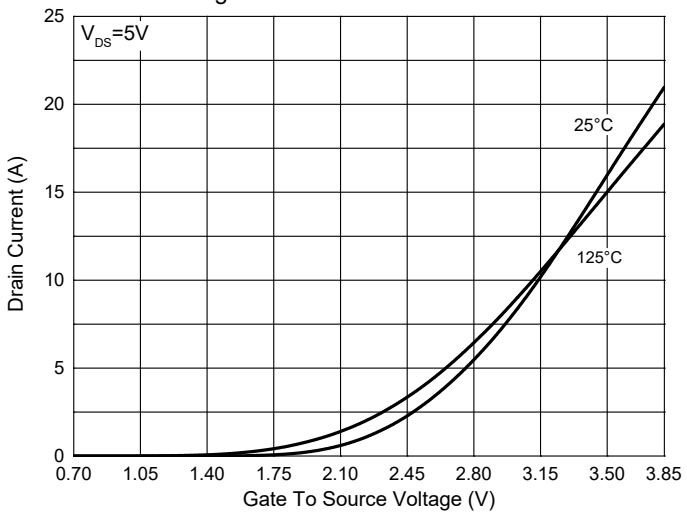


Fig. 3 - $R_{DS(ON)}$—V_{GS}

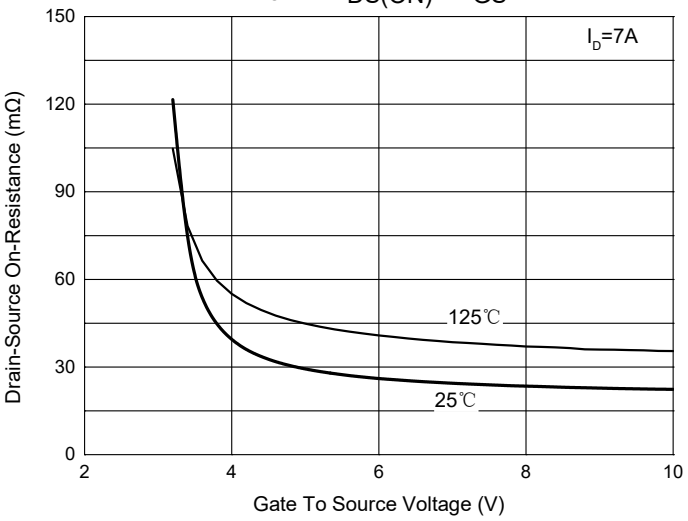


Fig. 4 - $R_{DS(ON)}$—I_D

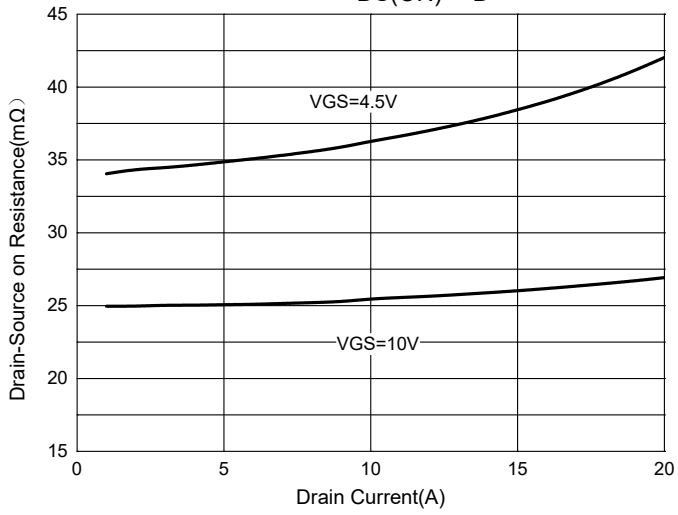


Fig. 5 - Capacitance Characteristics

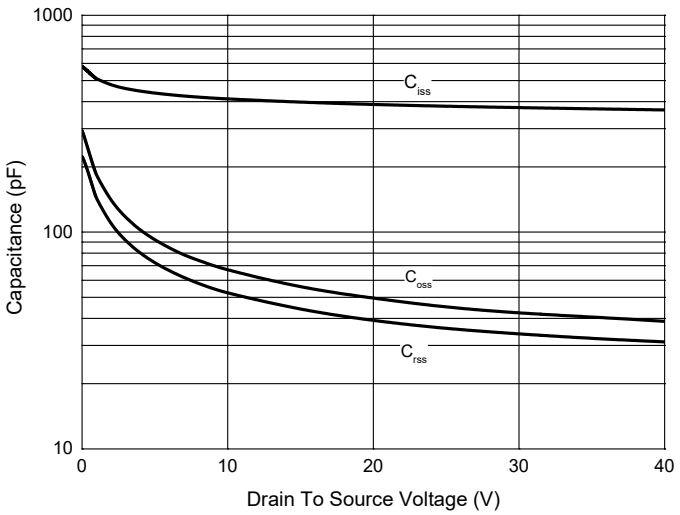
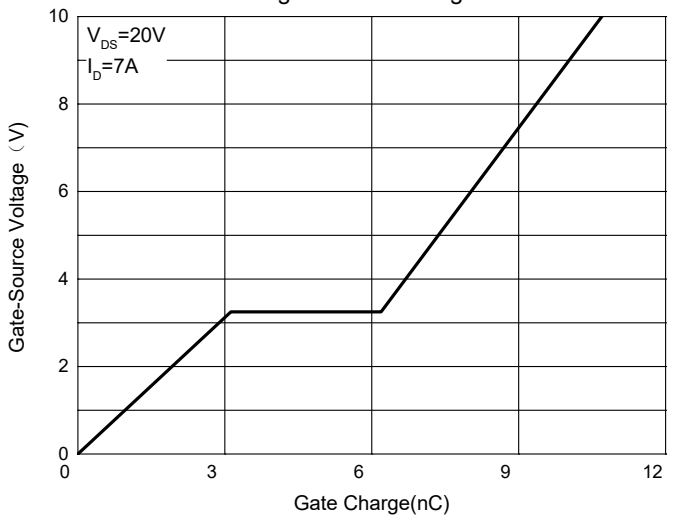


Fig. 6 - Gate Charge



Curve Characteristics (N-Channel)

Fig. 7 - Nomalized Threshold Voltage

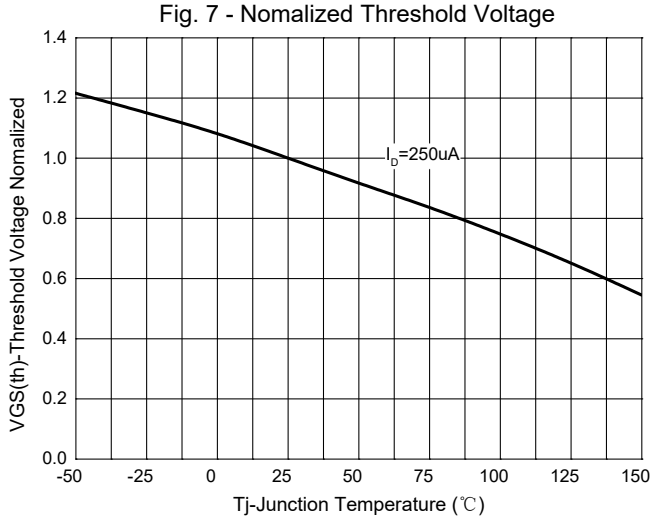


Fig.8-Normalized On Resistance Characteristics

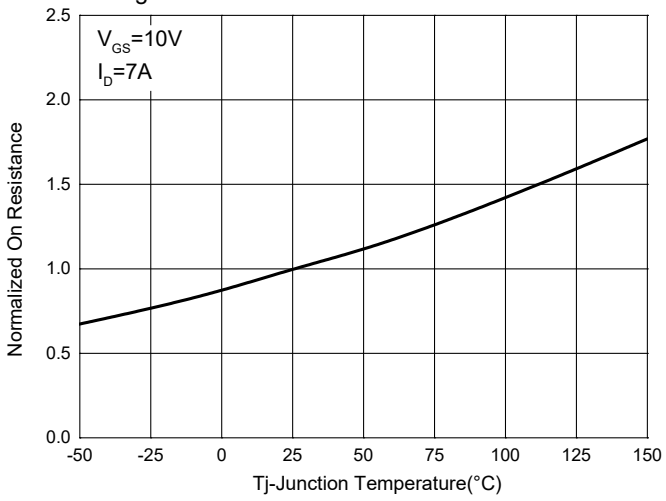


Fig.9 - I_S—V_{SD}

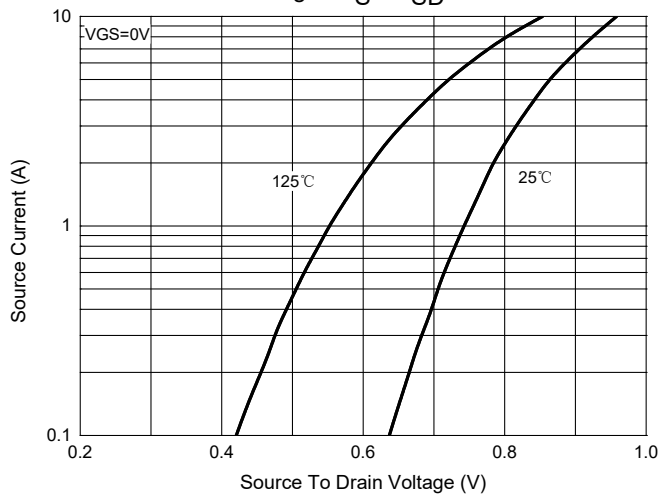


Fig. 10 - Drain Current

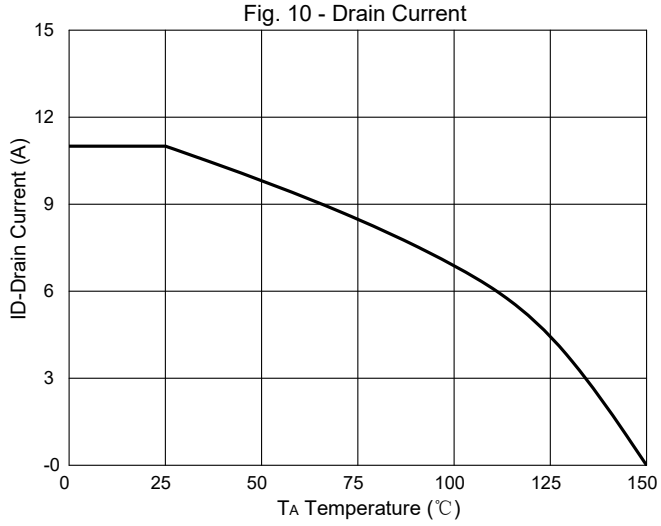
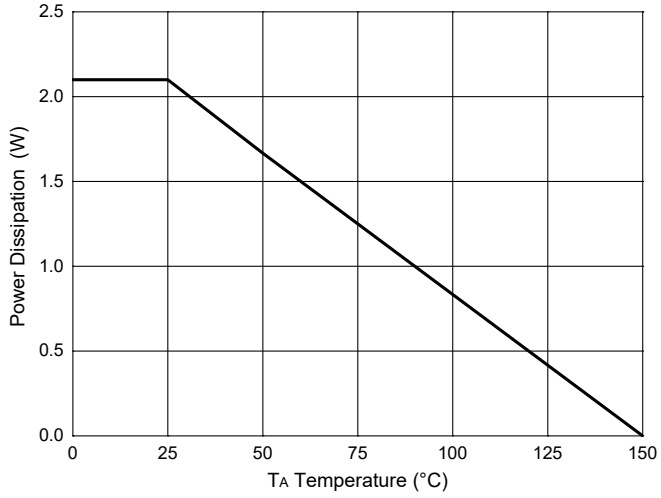


Fig.11-PD Dissipation



Curve Characteristics (N-Channel)

Fig. 12 - Safe Operation Area

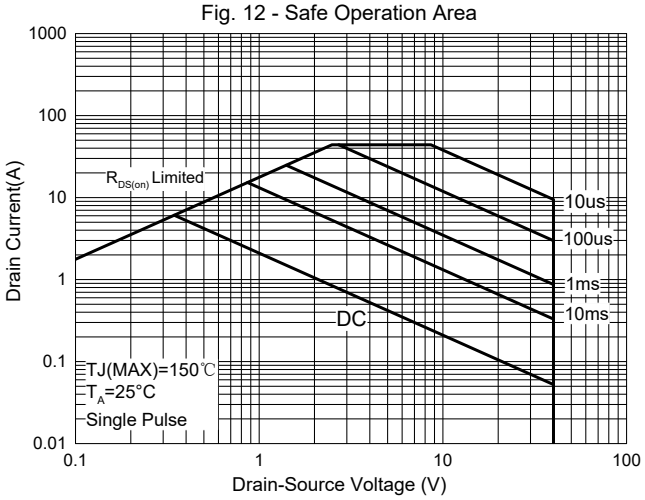
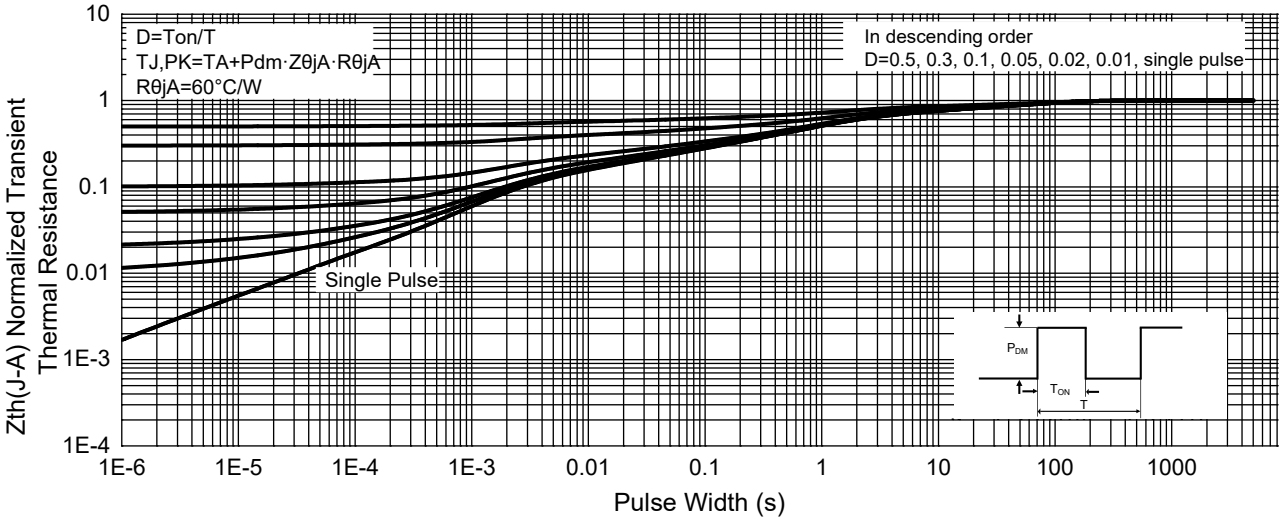


Fig. 13 -Normalized Transient Thermal Impedance



Curve Characteristics (P-Channel)

Fig. 1 - Typical Output Characteristics

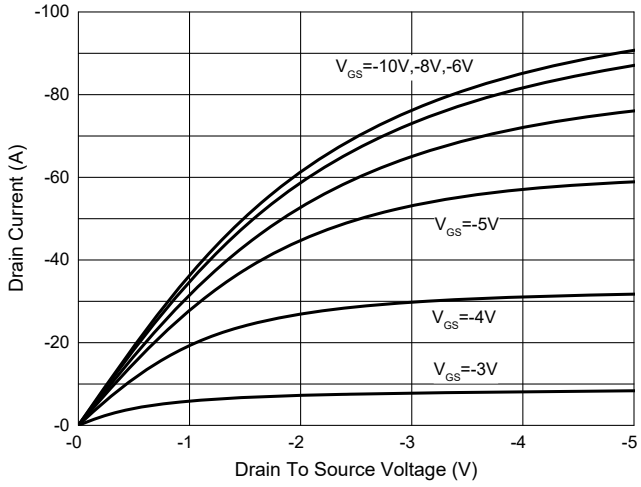


Fig. 2 - Transfer Characteristics

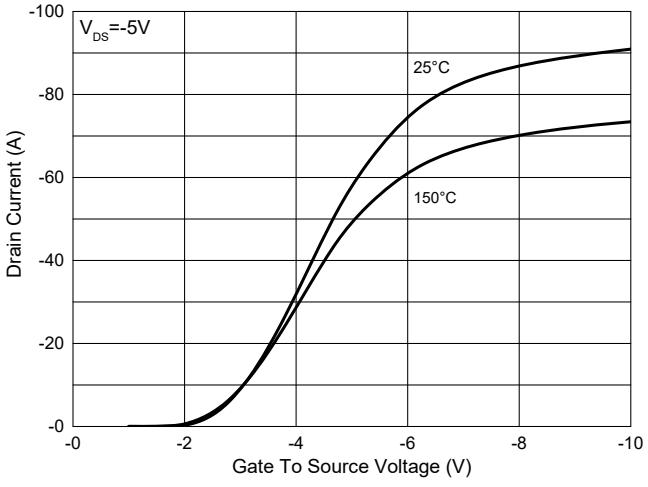


Fig. 3 - $R_{DS(ON)}$—V_{GS}

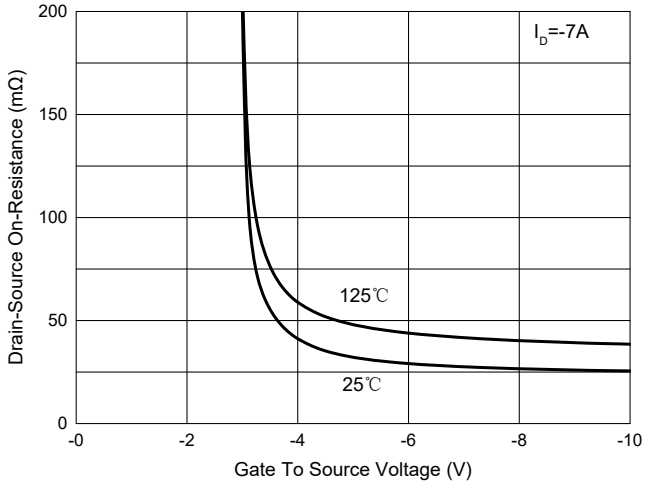


Fig. 4 - $R_{DS(ON)}$—I_D

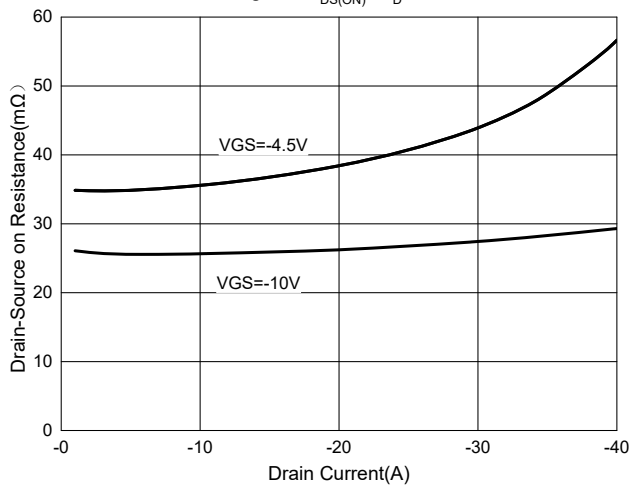


Fig. 5 - Capacitance Characteristics

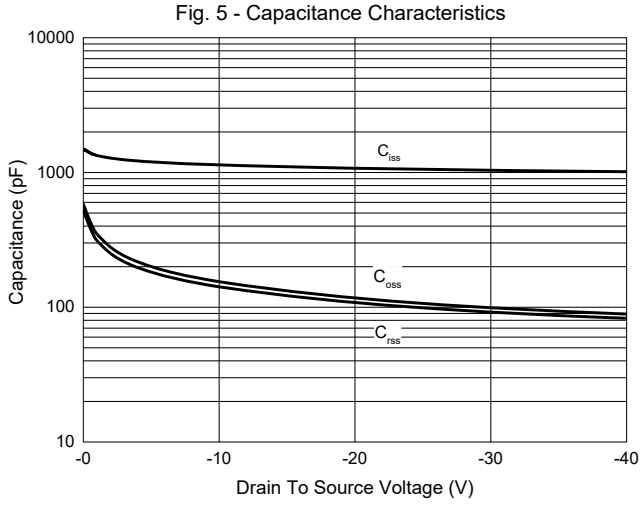
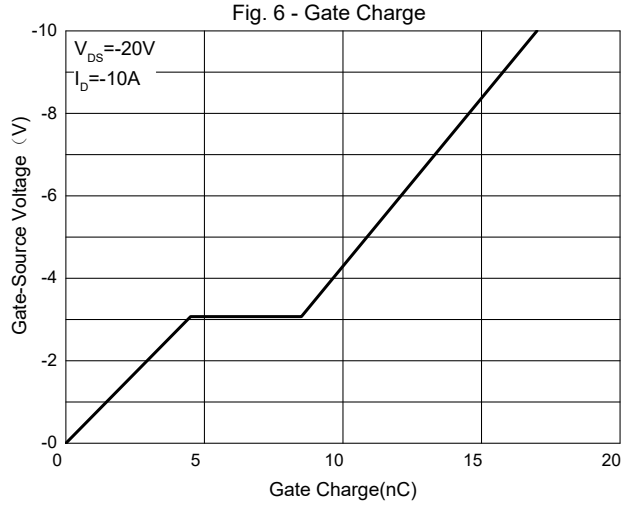


Fig. 6 - Gate Charge



Curve Characteristics (P-Channel)

Fig. 7 - Nomalized Threshold Voltage

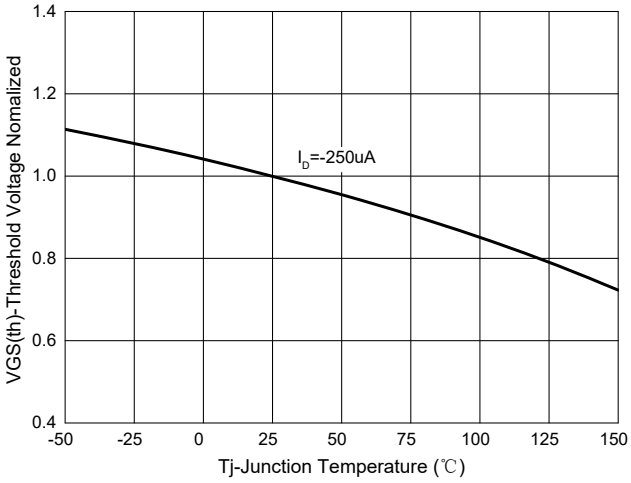


Fig.8-Normalized On Resistance Characteristics

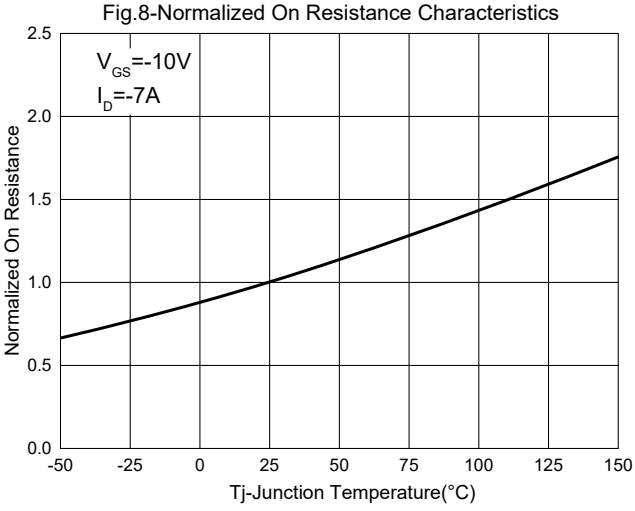


Fig.9 - I_S—V_{SD}

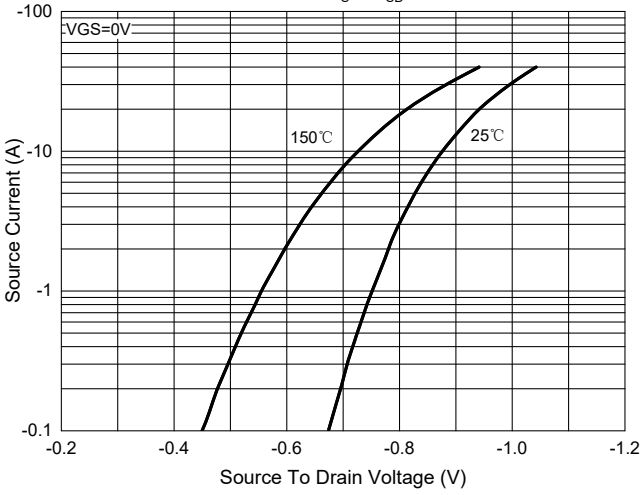


Fig. 10 - Drain Current

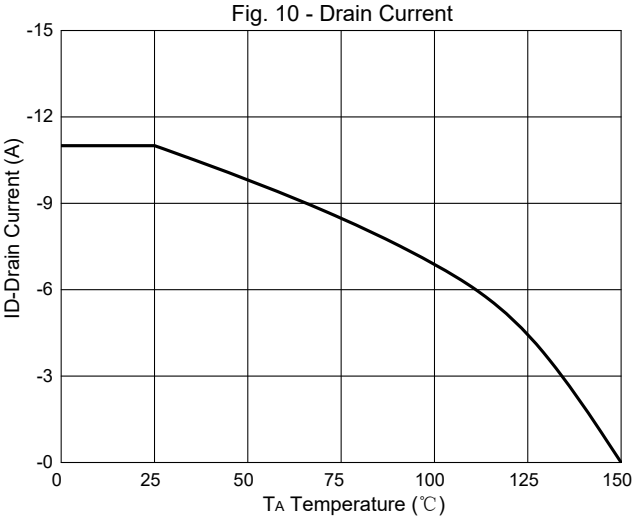
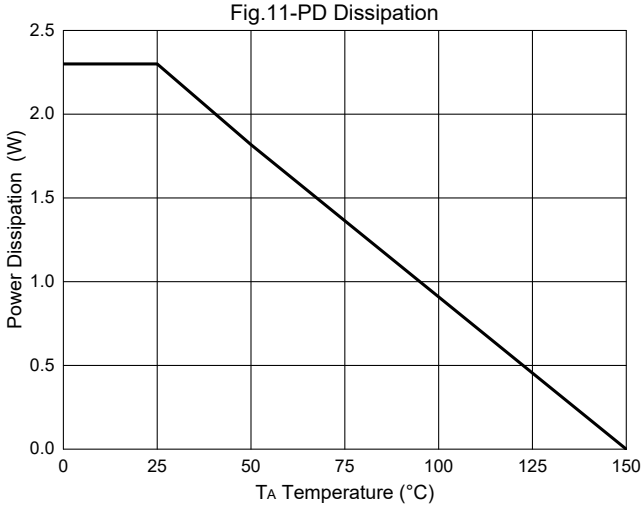


Fig.11-PD Dissipation



Curve Characteristics (P-Channel)

Fig. 12 - Safe Operation Area

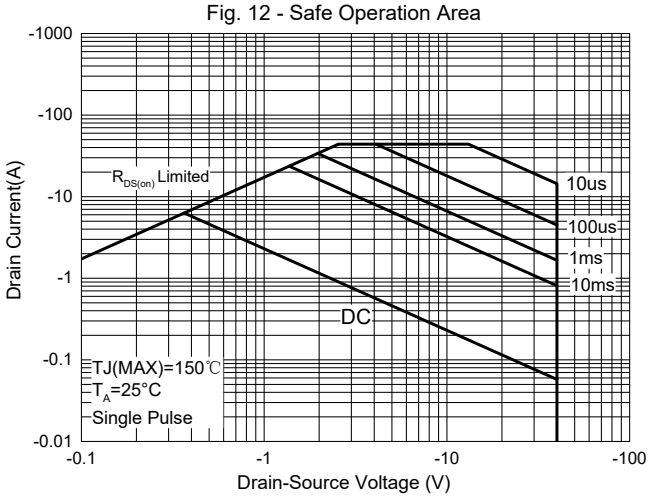
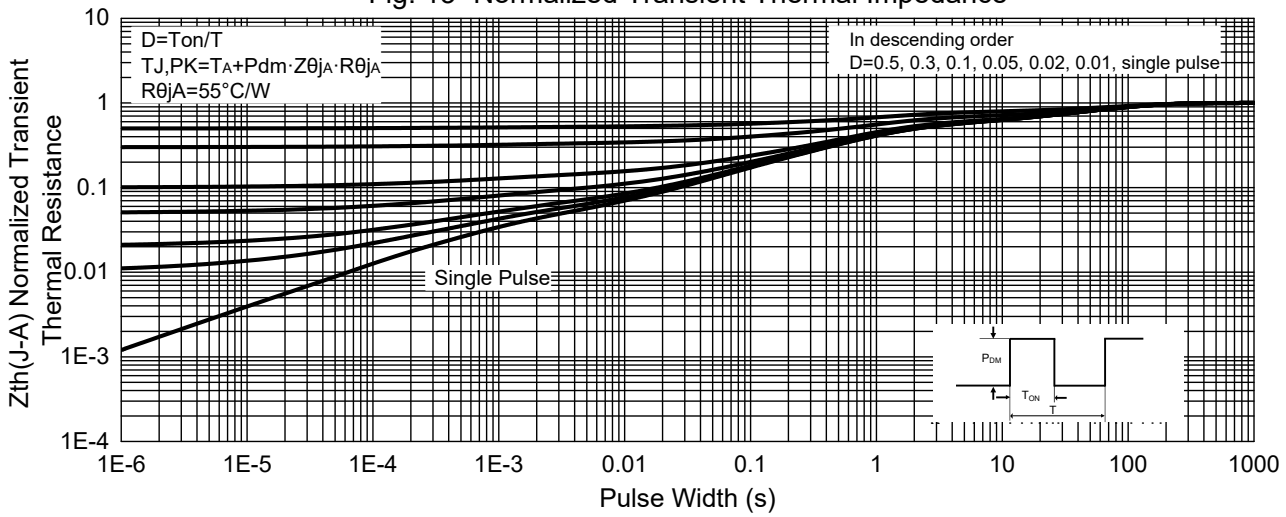


Fig. 13 -Normalized Transient Thermal Impedance



Ordering Information

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

Mouser Electronics

Authorized Distributor

Click to View Pricing, Inventory, Delivery & Lifecycle Information:

Micro Commercial Components (MCC):

MCQ11NP04-TP