

Features

- Split Gate Trench MOSFET Technology
- High Speed Switching
- Moisture Sensitivity Level 1
- Halogen Free. "Green" Device (Note1)
- Epoxy Meets UL 94 V-0 Flammability Rating
- Lead Free Finish/RoHS Compliant ("P" Suffix Designates RoHS Compliant. See Ordering Information)

Maximum Ratings

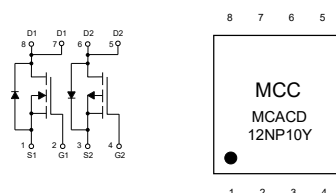
- Operating Junction Temperature Range : -55°C to +150°C
- Storage Temperature Range: -55°C to +150°C
- Thermal Resistance: 60°C/W Junction to Ambient^(Note2)
- Thermal Resistance: 3°C/W Junction to Case

Parameter	Symbol	Rating	Unit
N-Channel MOSFET			
Drain-Source Voltage	V_{DS}	100	V
Gate-Source Voltage	V_{GS}	±20	V
Continuous Drain Current	$T_C=25^\circ\text{C}$	25	A
	$T_C=100^\circ\text{C}$	15.8	
Pulsed Drain Current ^(Note 3)	I_{DM}	100	A
Total Power Dissipation ^(Note4)	P_D	41	W
Single Pulsed Avalanche Energy ^(Note5)	E_{AS}	64	mJ
P-Channel MOSFET			
Drain-Source Voltage	V_{DS}	-100	V
Gate-Source Voltage	V_{GS}	±20	V
Continuous Drain Current	$T_C=25^\circ\text{C}$	-12	A
	$T_C=100^\circ\text{C}$	-7.6	
Pulsed Drain Current ^(Note 3)	I_{DM}	-48	A
Total Power Dissipation ^(Note4)	P_D	41	W
Single Pulsed Avalanche Energy ^(Note5)	E_{AS}	72	mJ

Note:

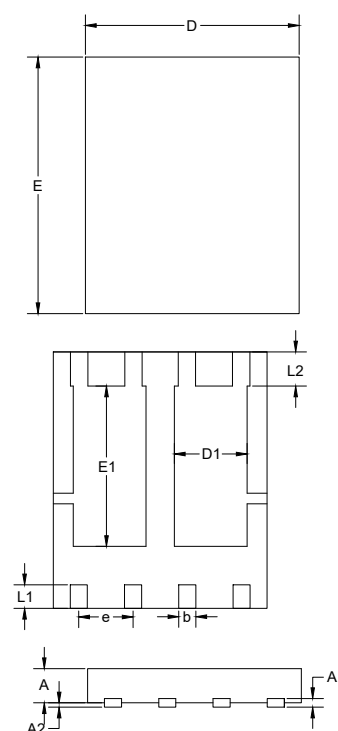
1. Halogen free "Green" products are defined as those which contain <900ppm bromine, <900ppm chlorine (<1500ppm total Br + Cl) and <1000ppm antimony compounds.
2. The value of $R_{\theta JA}$ is measured with the device mounted on 1in² FR-4 board with 2oz. Copper, in a still air environment with $T_A=25^\circ\text{C}$.
3. Repetitive rating; pulse width limited by max. junction temperature.
4. P_D is based on max. junction temperature, using junction-case thermal resistance.
5. NMOS: $T_J=25^\circ\text{C}$, $V_{DD}=50\text{V}$, $V_{GS}=10\text{V}$, $R_G=25\Omega$, $L=0.5\text{mH}$.
PMOS: $T_J=25^\circ\text{C}$, $V_{DD}=-50\text{V}$, $V_{GS}=-10\text{V}$, $R_G=25\Omega$, $L=0.5\text{mH}$.

Internal Structure and Marking Code



Dual N&P-CHANNEL MOSFET

DFN5060-8D



DIMENSIONS					
DIM	INCHES		MM		NOTE
	MIN	MAX	MIN	MAX	
D	0.193	0.201	4.90	5.10	
E	0.232	0.240	5.90	6.10	
A	0.028	0.035	0.70	0.90	
A1	0.008		0.20		BSC
A2	0.000	0.004	0.00	0.10	
D1	0.063	0.071	1.60	1.80	
E1	0.144	0.152	3.65	3.85	
L1	0.018	0.026	0.45	0.65	
L2	0.031		0.80		BSC
b	0.012	0.020	0.30	0.50	
e	0.050		1.27		BSC

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	100			V
Gate-Source Leakage Current	I _{GSS}	V _{DS} =0V, V _{GS} =±20V			±100	nA
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} =100V, V _{GS} =0V			1	μA
Gate-Threshold Voltage	V _{GS(th)}	V _{DS} =V _{GS} , I _D =250μA	1.2	1.7	2.5	V
Drain-Source On-Resistance	R _{DS(on)}	V _{GS} =10V, I _D =20A		19	26	mΩ
		V _{GS} =6V, I _D =10A		21	27	
		V _{GS} =4.5V, I _D =5A		22	30	
Gate Resistance	R _G	f=1MHz, Open Drain		1.5		Ω
Diode Characteristics						
Continuous Body Diode Current	I _S				25	A
Diode Forward Voltage	V _{SD}	V _{GS} =0V, I _S =20A			1.3	V
Reverse Recovery Time	t _{rr}	I _F =20A, dI _F /dt=100A/μs		40		ns
Reverse Recovery Charge	Q _{rr}			42		nC
Dynamic Characteristics						
Input Capacitance	C _{iss}	V _{DS} =25V, V _{GS} =0V, f=1MHz		1270		pF
Output Capacitance	C _{oss}			750		
Reverse Transfer Capacitance	C _{rss}			35		
Total Gate Charge	Q _g	V _{GS} =10V, V _{DS} =50V, I _D =20A		17		nC
Gate-Source Charge	Q _{gs}			6		
Gate-Drain Charge	Q _{gd}			3		
Turn-On Delay Time	t _{d(on)}	V _{GS} =10V, V _{DD} =50V, I _{DS} =20A, R _G =3Ω		40		ns
Turn-On Rise Time	t _r			12		
Turn-Off Delay Time	t _{d(off)}			55		
Turn-Off Fall Time	t _f			16		

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	-100			V
Gate-Source Leakage Current	I _{GSS}	V _{DS} =0V, V _{GS} =±20V			±100	nA
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} =-100V, V _{GS} =0V			-1	μA
Gate-Threshold Voltage	V _{GS(th)}	V _{DS} =V _{GS} , I _D =-250μA	-1.2	-1.7	-2.5	V
Drain-Source On-Resistance	R _{DS(on)}	V _{GS} =-10V, I _D =-12A		90	120	mΩ
		V _{GS} =-6V, I _D =-6A		93	125	
		V _{GS} =-4.5V, I _D =-3A		96	130	
Gate Resistance	R _G	f=1MHz, Open Drain		10		Ω
Diode Characteristics						
Continuous Body Diode Current	I _S				-12	A
Diode Forward Voltage	V _{SD}	V _{GS} =0V, I _S =-12A			-1.2	V
Reverse Recovery Time	t _{rr}	I _F =-6A, dI _F /dt=100A/μs		70		ns
Reverse Recovery Charge	Q _{rr}			140		nC
Dynamic Characteristics						
Input Capacitance	C _{iss}	V _{DS} =-25V, V _{GS} =0V, f=1MHz		1120		pF
Output Capacitance	C _{oss}			180		
Reverse Transfer Capacitance	C _{rss}			25		
Total Gate Charge	Q _g	V _{GS} =-10V, V _{DS} =-50V, I _D =-6A		20		nC
Gate-Source Charge	Q _{gs}			4		
Gate-Drain Charge	Q _{gd}			4.5		
Turn-On Delay Time	t _{d(on)}	V _{GS} =-10V, V _{DD} =-50V, I _D =-6A, R _G =2.2Ω		10		ns
Turn-On Rise Time	t _r			30		
Turn-Off Delay Time	t _{d(off)}			77		
Turn-Off Fall Time	t _f			80		

Curve Characteristics(N-Channel)

Fig. 1 - Typical Output Characteristics

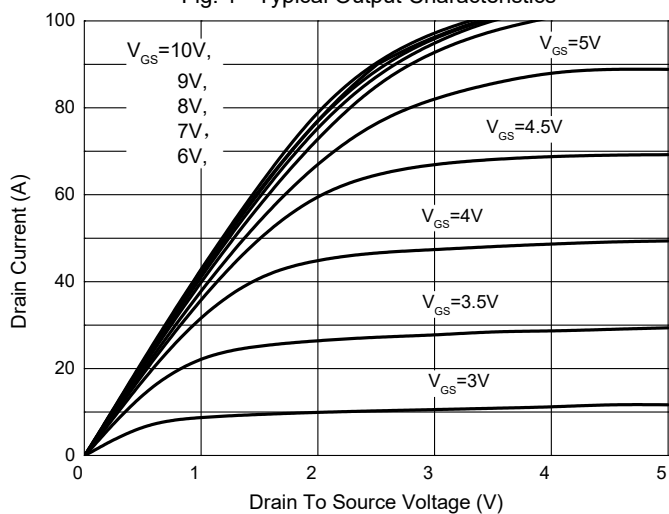


Fig. 2 - Transfer Characteristics

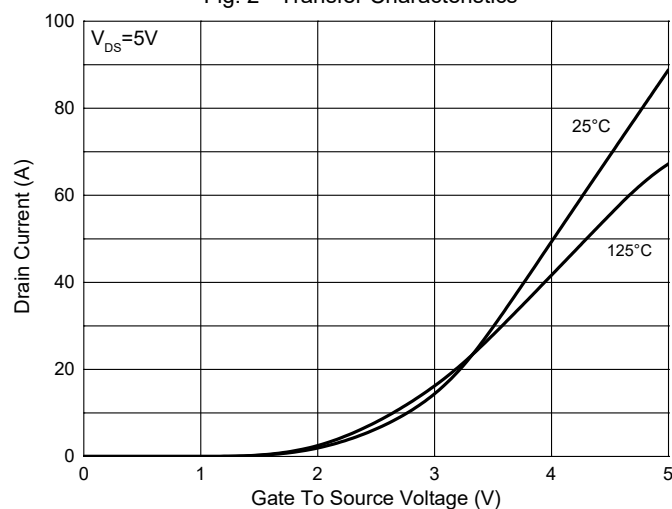


Fig. 3 - $R_{DS(ON)}$ — V_{GS}

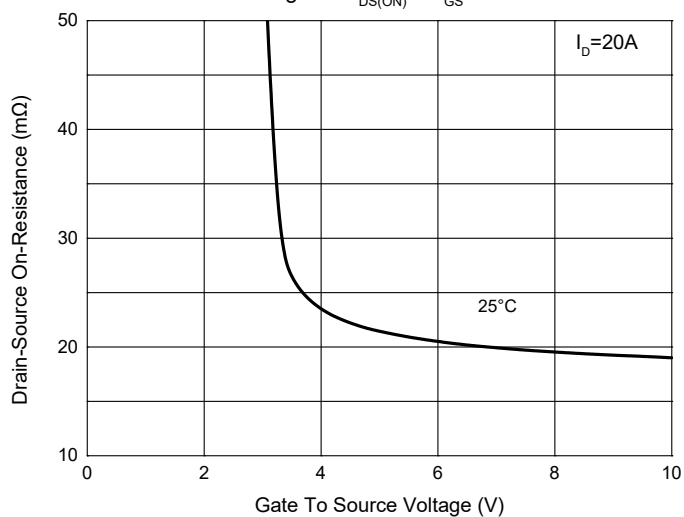


Fig. 4 - $R_{DS(ON)}$ — I_D

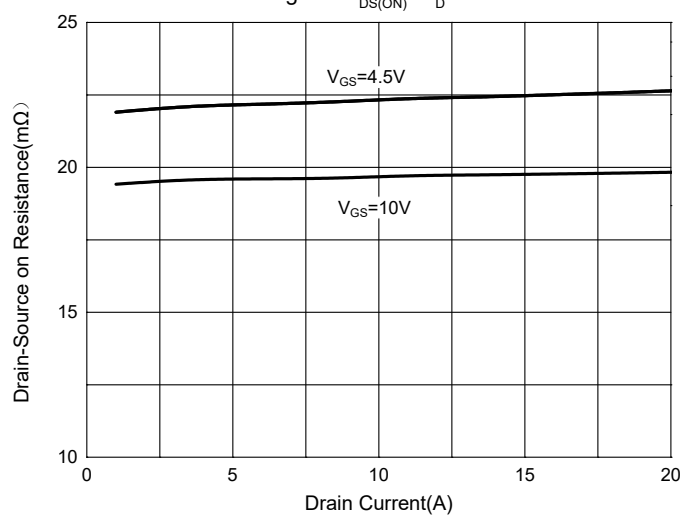


Fig. 5 - Capacitance Characteristics

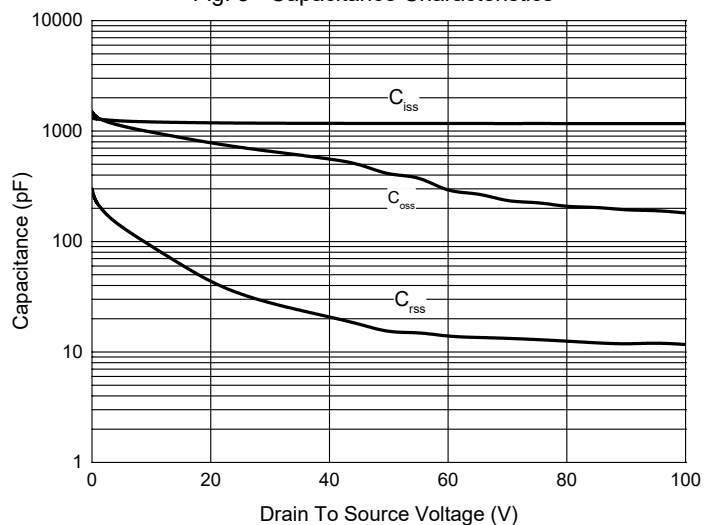
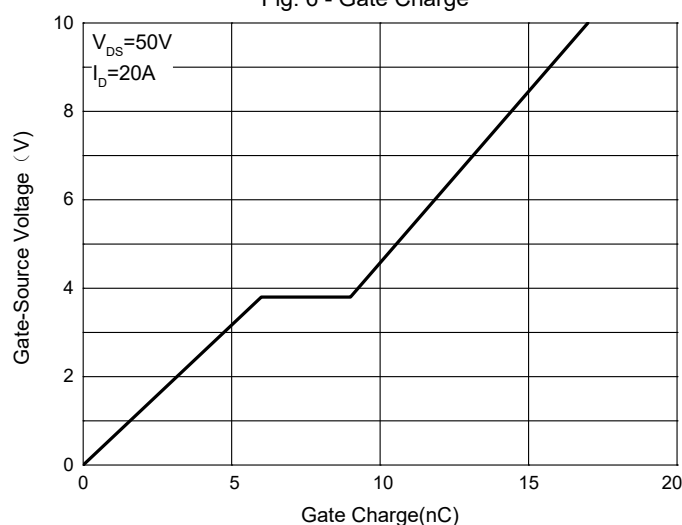


Fig. 6 - Gate Charge



Curve Characteristics(N-Channel)

Fig. 7 - Normalized Threshold Voltage

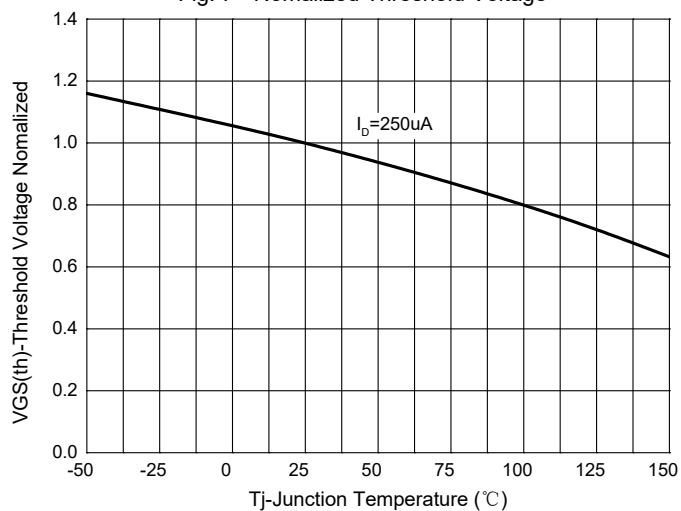


Fig.8-Normalized On Resistance Characteristics

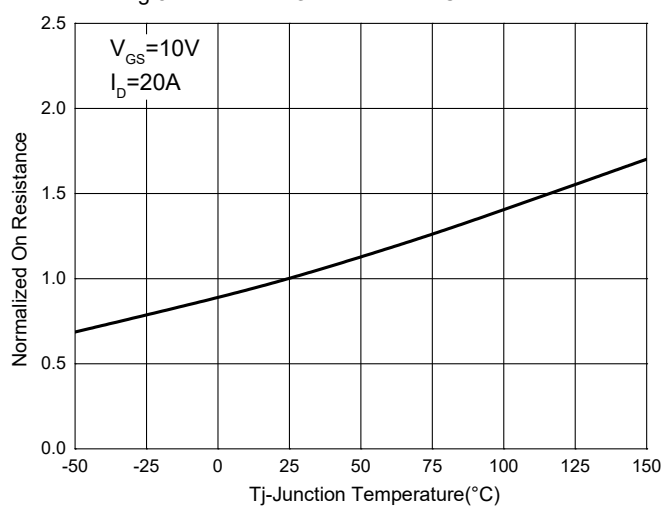


Fig.9 - $I_S - V_{SD}$

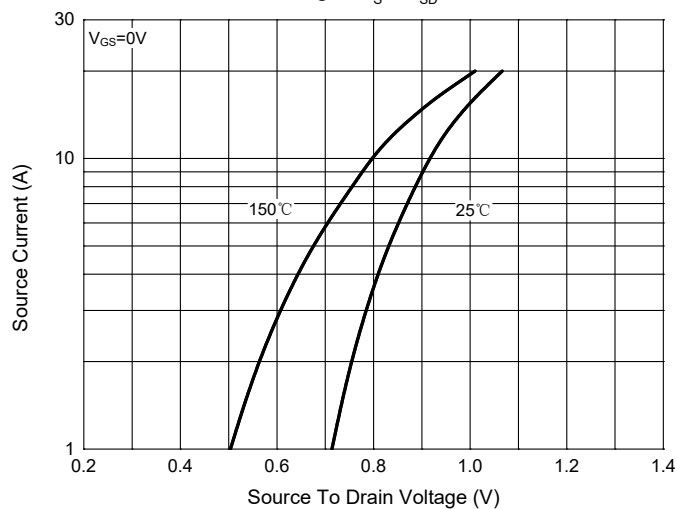


Fig. 10 - Drain Current

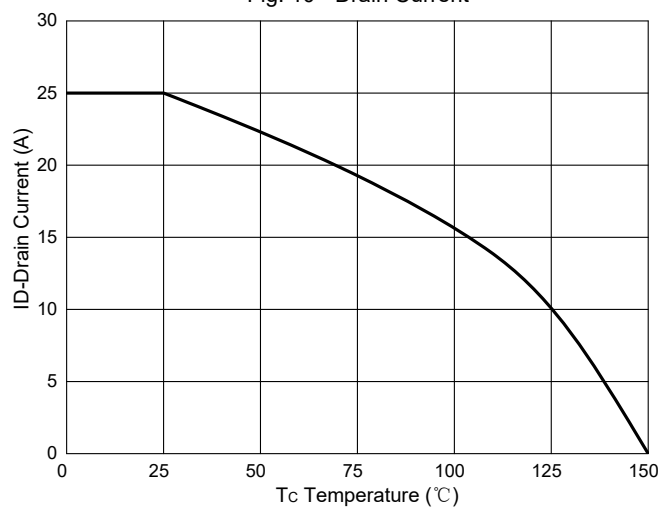
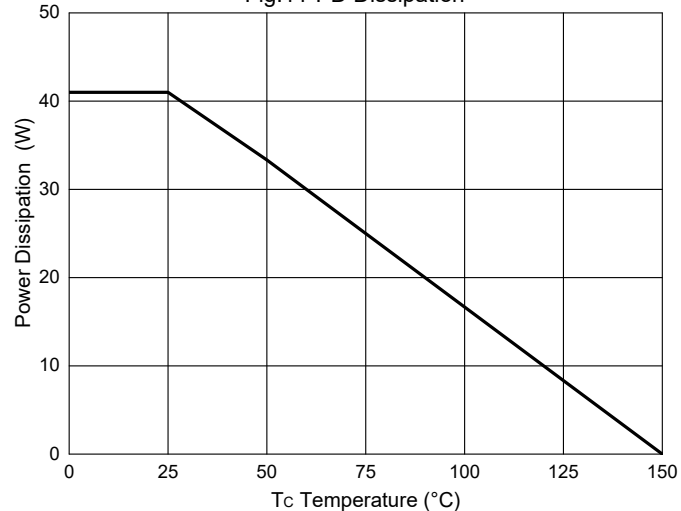


Fig.11-PD Dissipation



Curve Characteristics(N-Channel)

Fig. 12 - Safe Operation Area

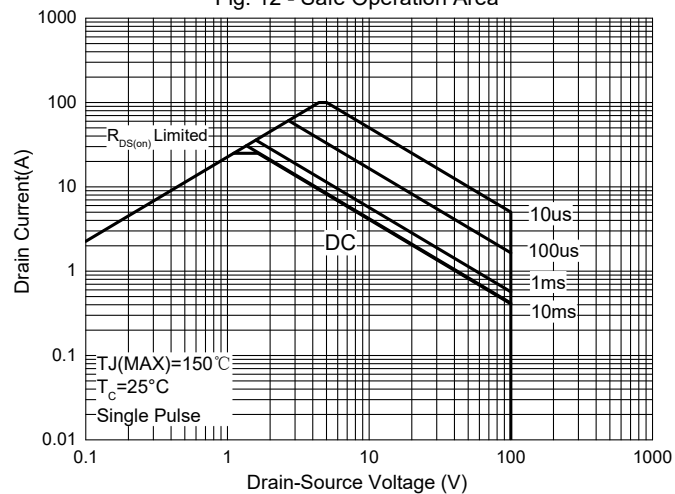
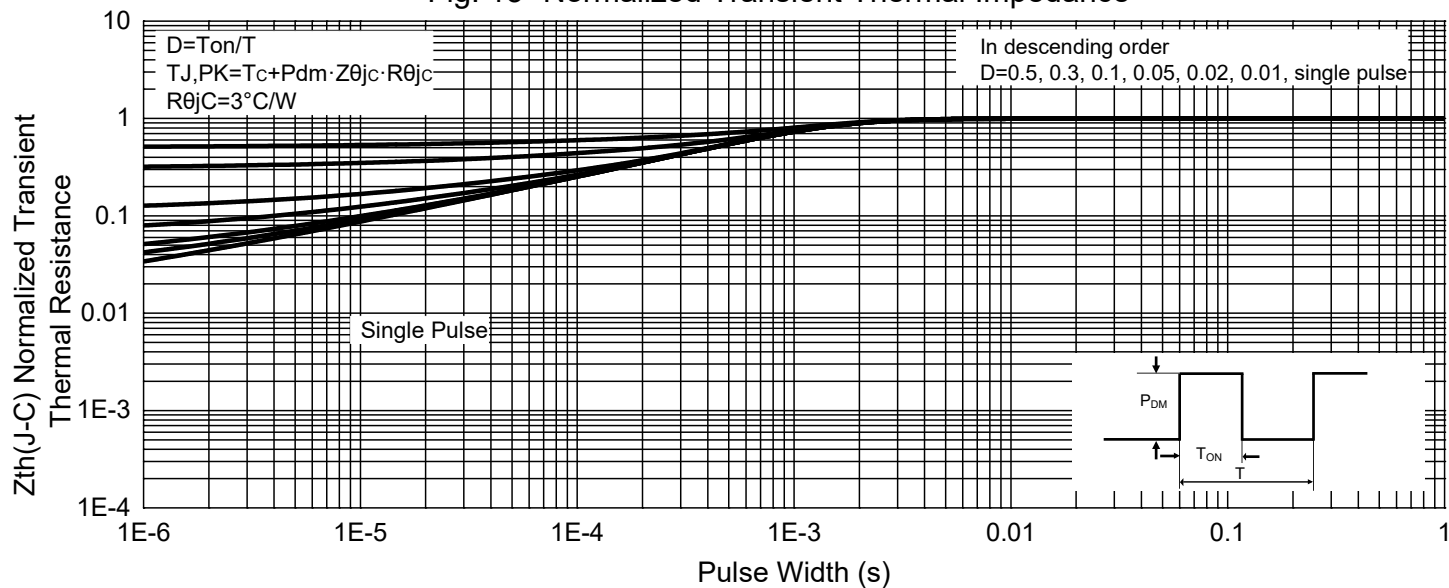


Fig. 13 -Normalized Transient Thermal Impedance



Curve Characteristics(P-Channel)

Fig. 1 - Typical Output Characteristics

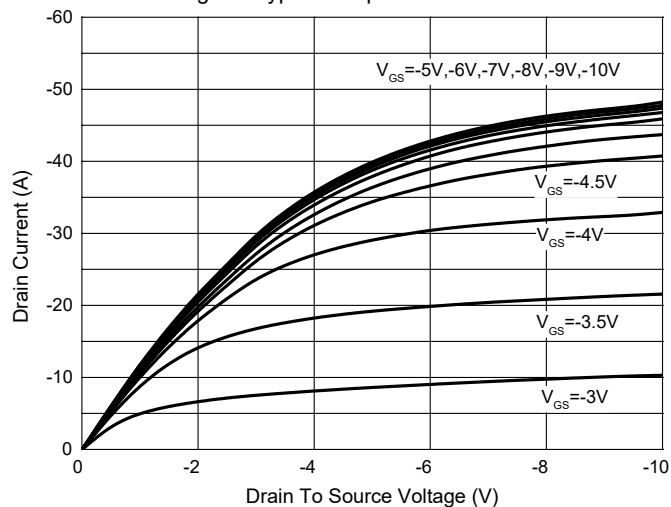


Fig. 2 - Transfer Characteristics

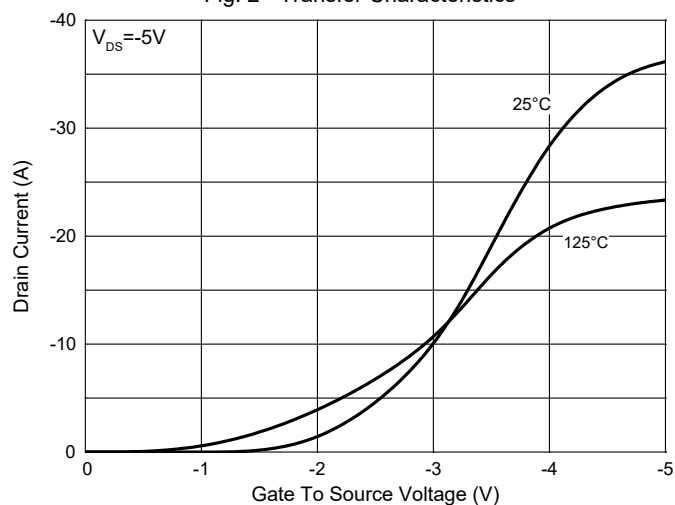


Fig. 3 - $R_{DS(ON)}$ - V_{GS}

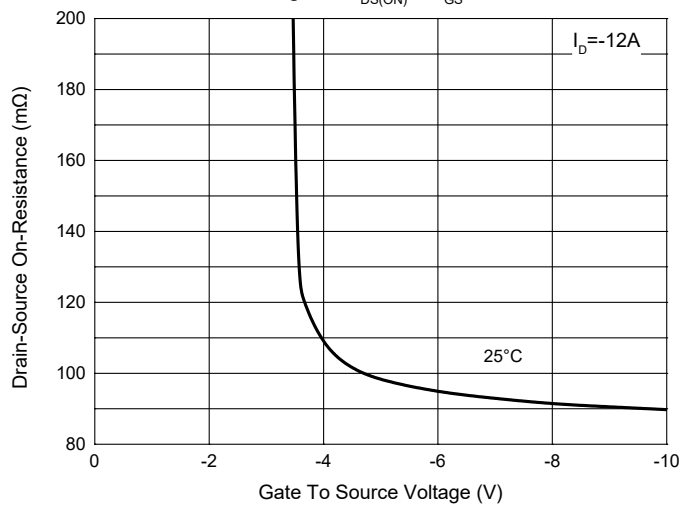


Fig. 4 - $R_{DS(ON)}$ - I_D

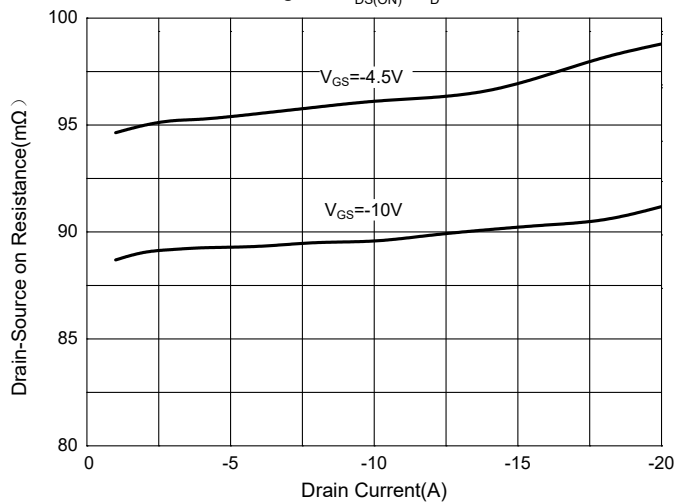


Fig. 5 - Capacitance Characteristics

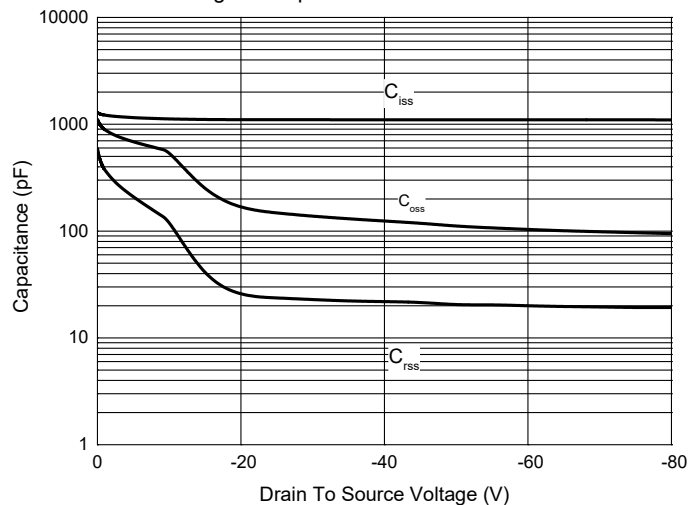
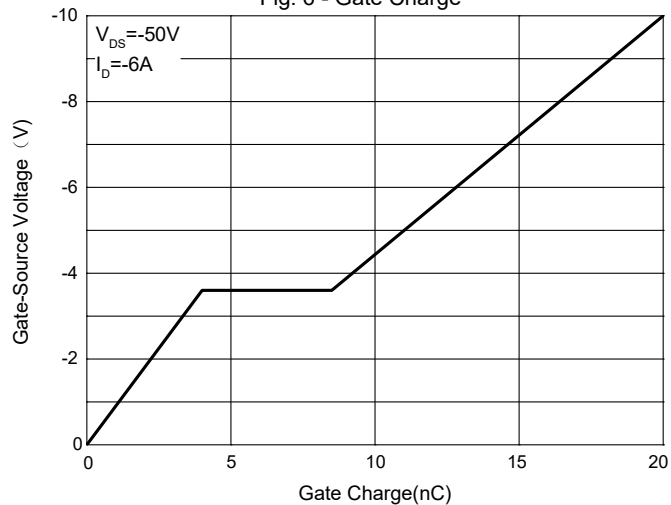


Fig. 6 - Gate Charge



Curve Characteristics(P-Channel)

Fig. 7 - Normalized Threshold Voltage

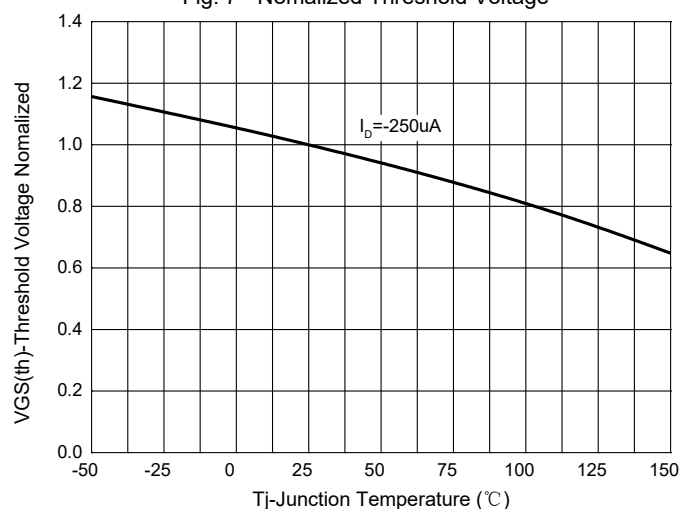


Fig.8-Normalized On Resistance Characteristics

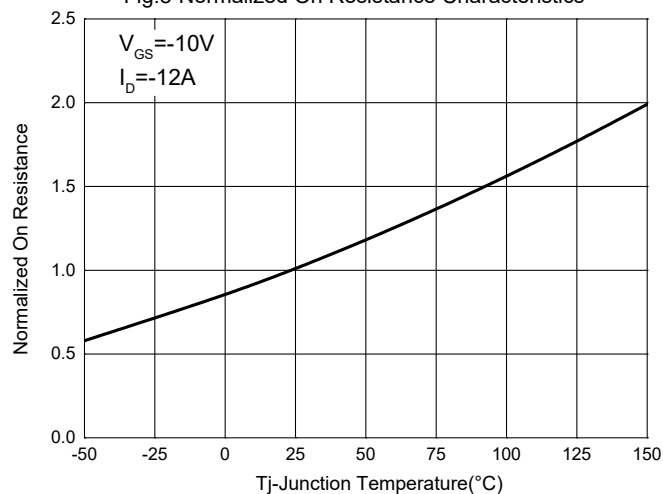


Fig.9 - $I_S - V_{SD}$

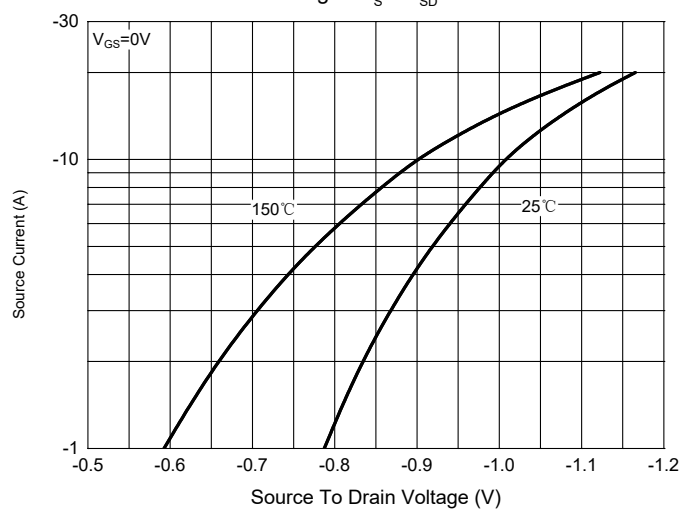


Fig. 10 - Drain Current

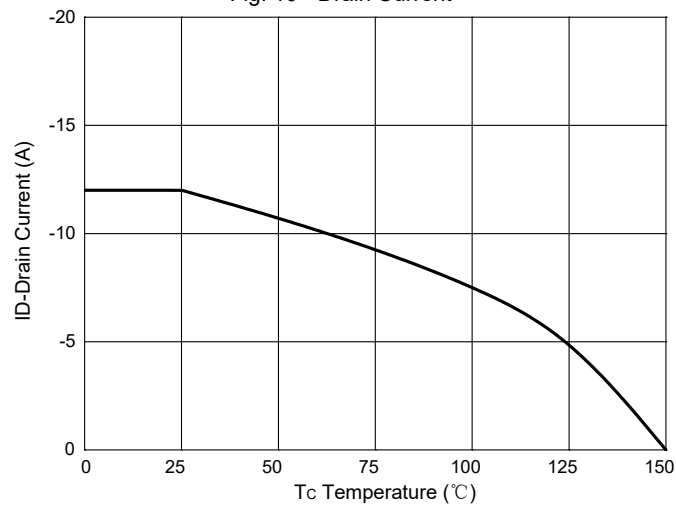
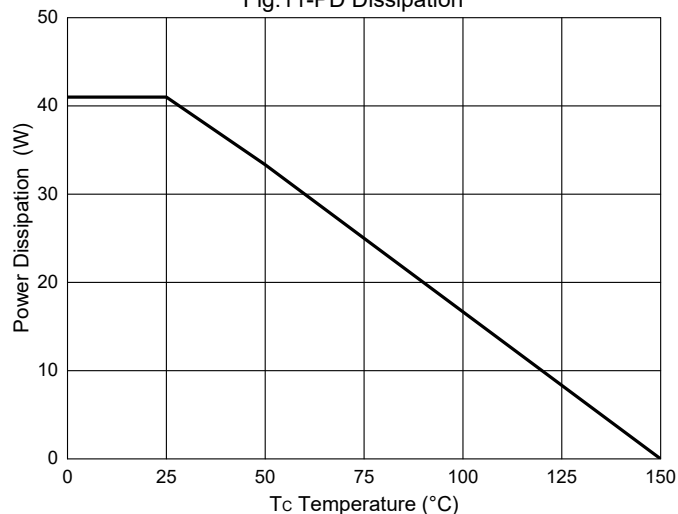


Fig.11-PD Dissipation



Curve Characteristics(P-Channel)

Fig. 12 - Safe Operation Area

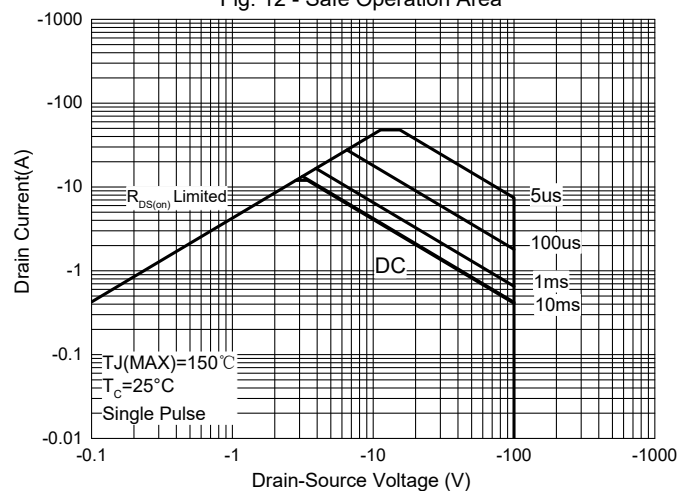
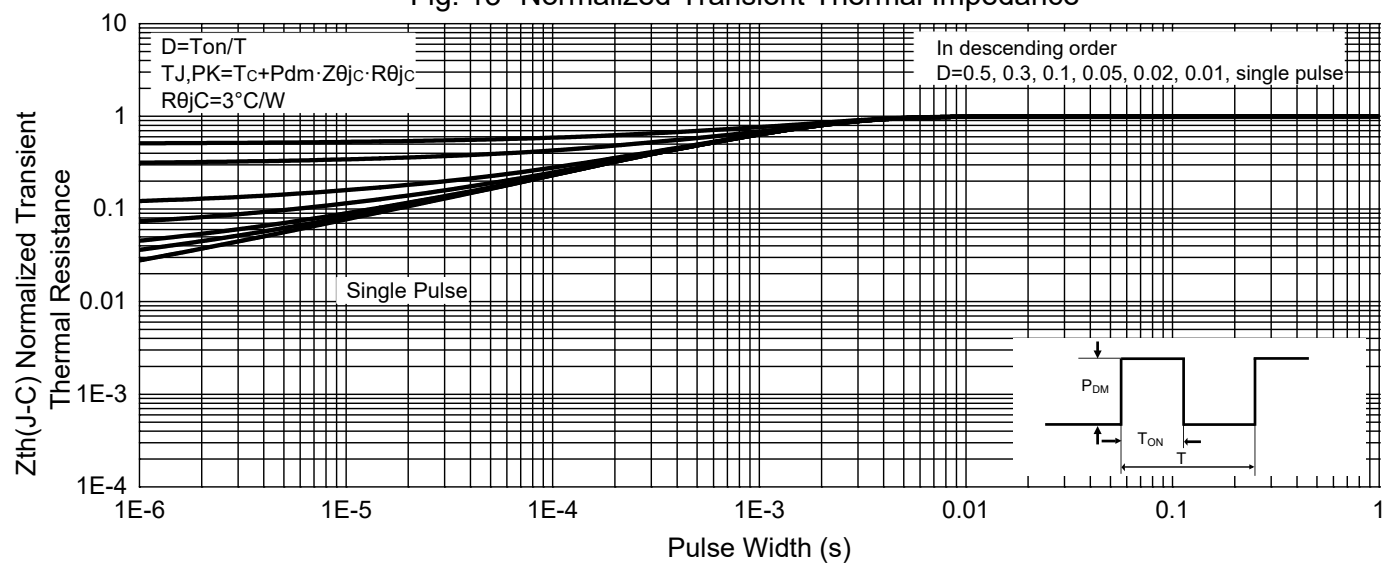


Fig. 13 -Normalized Transient Thermal Impedance



Ordering Information

Device	Packing
Part Number-TP	Tape&Reel: 5Kpcs/Reel

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