

Features

- Trench Power LV MOSFET Technology
- Excellent Package For Heat Dissipation
- 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

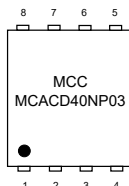
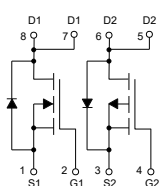
- Operating Junction Temperature Range : -55°C to +150°C
- Storage Temperature Range: -55°C to +150°C
- Thermal Resistance: 50°C/W Junction to Ambient^(Note2)
- NMOS:Thermal Resistance: 2.5°C/W Junction to Case
- PMOS:Thermal Resistance: 2.3°C/W Junction to Case

Parameter	Symbol	Rating	Unit
N-Channel MOSFET			
Drain-Source Voltage	V _{DS}	30	V
Gate-Source Voltage	V _{GS}	±20	V
Continuous Drain Current	I _D	T _C =25°C	40
		T _C =100°C	25
Pulsed Drain Current ^(Note 3)	I _{DM}	160	A
Total Power Dissipation ^(Note4)	P _D	50	W
Single Pulsed Avalanche Energy ^(Note5)	E _{AS}	56	mJ
P-Channel MOSFET			
Drain-Source Voltage	V _{DS}	-30	V
Gate-Source Voltage	V _{GS}	±25	V
Continuous Drain Current	I _D	T _C =25°C	-40
		T _C =100°C	-25
Pulsed Drain Current ^(Note 3)	I _{DM}	-160	A
Total Power Dissipation ^(Note4)	P _D	54	W
Single Pulsed Avalanche Energy ^(Note5)	E _{AS}	90	mJ

Note:

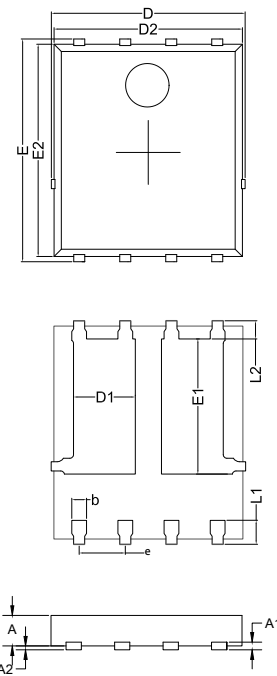
1. Halogen free "Green" products are defined as those which contain <900ppm bromine, <900ppm chlorine (<1500ppm total Br + Cl) and <1000ppm antimony compounds.
2. The value of R_{θJA} is measured with the device mounted on 1in² FR-4 board with 2oz. Copper, in a still air environment with T_A =25°C.
3.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

Internal Structure and Marking Code



**Dual
N&P-CHANNEL
MOSFET**

PDFN5060-8D



DIM	DIMENSIONS				NOTE
	INCHES		MM		
	MIN	MAX	MIN	MAX	
D	0.203	0.218	5.15	5.55	
D2	0.197	0.213	5.00	5.40	
E	0.234	0.250	5.95	6.35	
E2	0.223	0.238	5.66	6.06	
A	0.039	0.047	1.00	1.20	
A1	0.010		0.254		BSC
A2	0.000	0.004	0.00	0.10	
D1	0.059	0.075	1.50	1.90	
E1	0.139	0.154	3.52	3.92	
L1	0.022	0.030	0.56	0.76	
L2	0.019		0.50		BSC
b	0.012	0.020	0.31	0.51	
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	$V_{(BR)DSS}$	$V_{GS}=0V, I_D=250\mu A$	30			V
Gate-Source Leakage Current	I_{GSS}	$V_{DS}=0V, V_{GS}=\pm 20V$			± 100	nA
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS}=30V, V_{GS}=0V$			1	μA
Gate-Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=250\mu A$	1	1.5	2.5	V
Drain-Source On-Resistance	$R_{DS(on)}$	$V_{GS}=10V, I_D=20A$		6.5	9	m Ω
		$V_{GS}=4.5V, I_D=10A$		10	14	
Gate Resistance	R_G	f=1MHz, Open Drain		2.5		Ω
Diode Characteristics						
Continuous Body Diode Current	I_S				40	A
Diode Forward Voltage	V_{SD}	$V_{GS}=0V, I_S=20A$			1.2	V
Reverse Recovery Time	t_{rr}	$I_F=20A, dI_F/dt=100A/\mu s$		5		ns
Reverse Recovery Charge	Q_{rr}			0.2		nC
Dynamic Characteristics						
Input Capacitance	C_{iss}	$V_{DS}=15V, V_{GS}=0V, f=1MHz$		1050		pF
Output Capacitance	C_{oss}			180		
Reverse Transfer Capacitance	C_{rss}			160		
Total Gate Charge	Q_g	$V_{GS}=10V, V_{DS}=15V, I_D=20A$		23.6		nC
Gate-Source Charge	Q_{gs}			3.9		
Gate-Drain Charge	Q_{gd}			7		
Turn-On Delay Time	$t_{d(on)}$	$V_{GS}=10V, V_{DD}=15V$ $I_{DS}=20A, R_G=2.2\Omega$		7		ns
Turn-On Rise Time	t_r			19		
Turn-Off Delay Time	$t_{d(off)}$			24		
Turn-Off Fall Time	t_f			24		

P-Channel Electrical Characteristics @ 25°C (Unless Otherwise Specified)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Static Characteristics						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	$V_{GS}=0V, I_D=-250\mu A$	-30			V
Gate-Source Leakage Current	I_{GSS}	$V_{DS}=0V, V_{GS}=\pm 25V$			± 100	nA
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS}=-30V, V_{GS}=0V$			-1	μA
Gate-Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=-250\mu A$	-1.2	-1.8	-2.7	V
Drain-Source On-Resistance	$R_{DS(on)}$	$V_{GS}=-10V, I_D=-20A$		9	12	m Ω
		$V_{GS}=-4.5V, I_D=-10A$		15	20	
Gate Resistance	R_G	f=1MHz, Open Drain		17		Ω
Diode Characteristics						
Continuous Body Diode Current	I_S				-40	A
Diode Forward Voltage	V_{SD}	$V_{GS}=0V, I_S=-20A$			-1.2	V
Reverse Recovery Time	t_{rr}	$I_F=-20A, dI_F/dt=100A/\mu s$		43		ns
Reverse Recovery Charge	Q_{rr}			22		nC
Dynamic Characteristics						
Input Capacitance	C_{iss}	$V_{DS}=-15V, V_{GS}=0V, f=1MHz$		1860		pF
Output Capacitance	C_{oss}			310		
Reverse Transfer Capacitance	C_{rss}			280		
Total Gate Charge	Q_g	$V_{GS}=-10V, V_{DS}=-15V, I_D=-20A$		38		nC
Gate-Source Charge	Q_{gs}			6		
Gate-Drain Charge	Q_{gd}			10		
Turn-On Delay Time	$t_{d(on)}$	$V_{GS}=-10V, V_{DD}=-15V$ $I_D=-20A, R_G=2.2\Omega$		8		ns
Turn-On Rise Time	t_r			6		
Turn-Off Delay Time	$t_{d(off)}$			108		
Turn-Off Fall Time	t_f			69		

Curve Characteristics(N-Channel)

Fig. 1 - Typical Output Characteristics

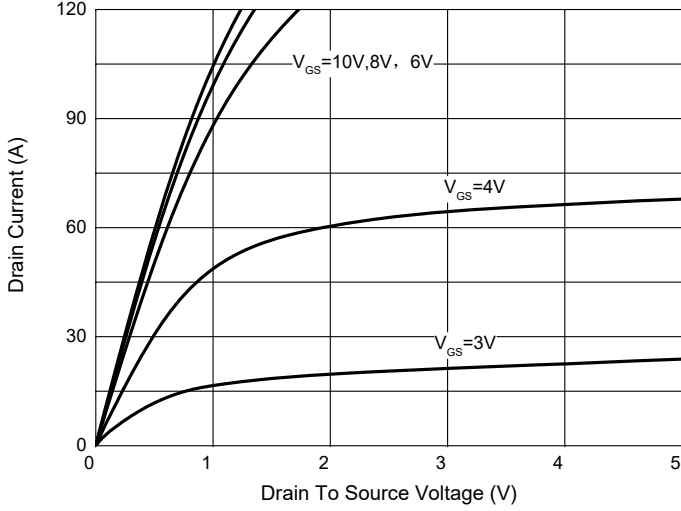


Fig. 2 - Transfer Characteristics

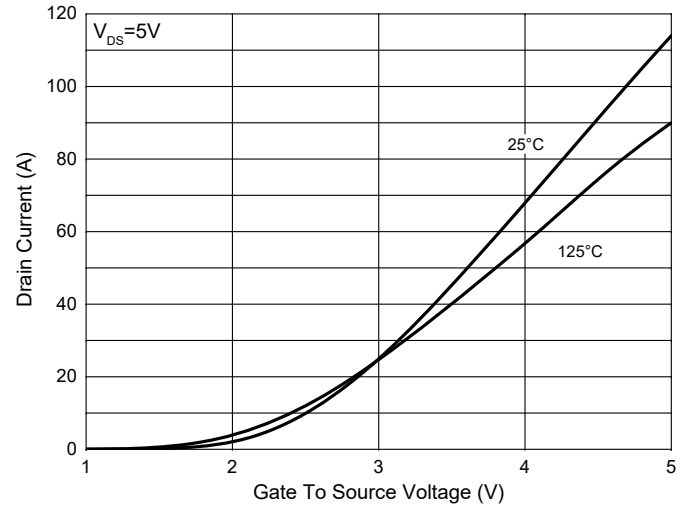


Fig. 3 - $R_{DS(ON)} - V_{GS}$

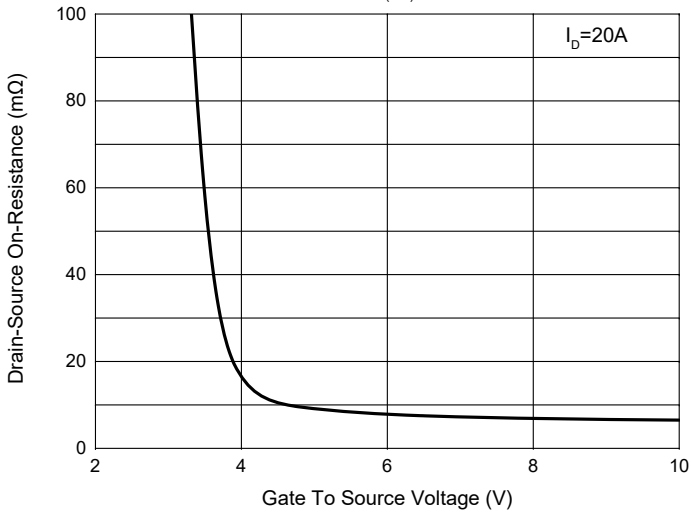


Fig. 4 - $R_{DS(ON)} - I_D$

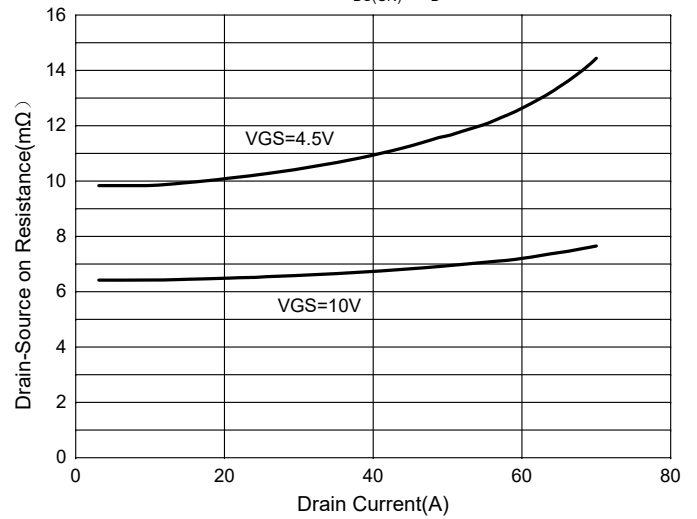


Fig. 5 - Capacitance Characteristics

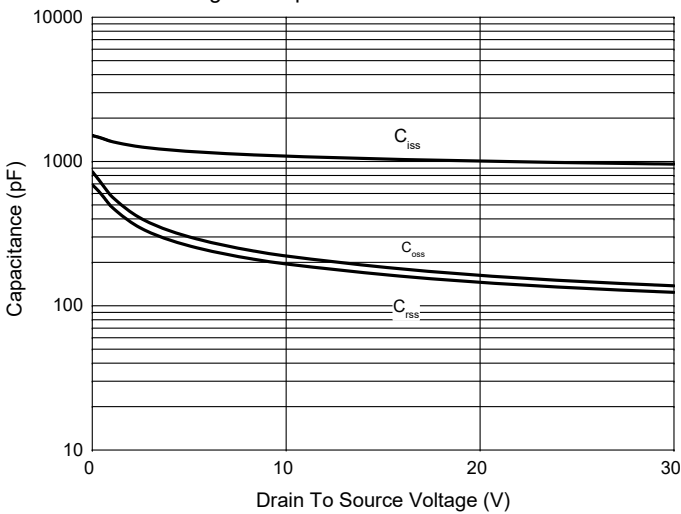
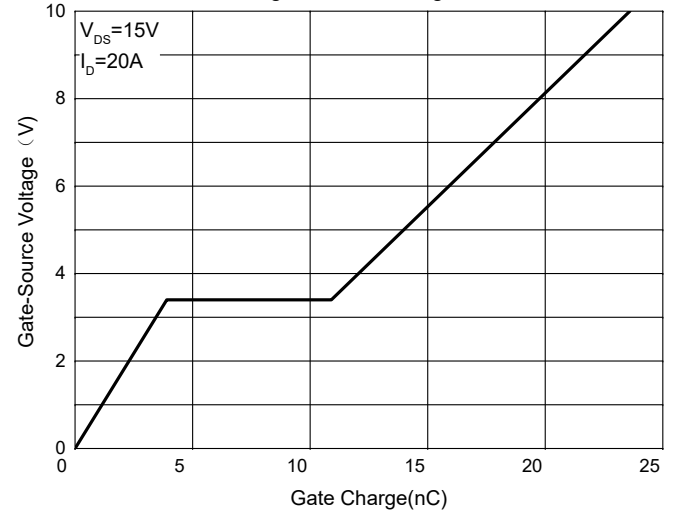


Fig. 6 - Gate Charge



Curve Characteristics(N-Channel)

Fig. 7 - Normalized Threshold Voltage

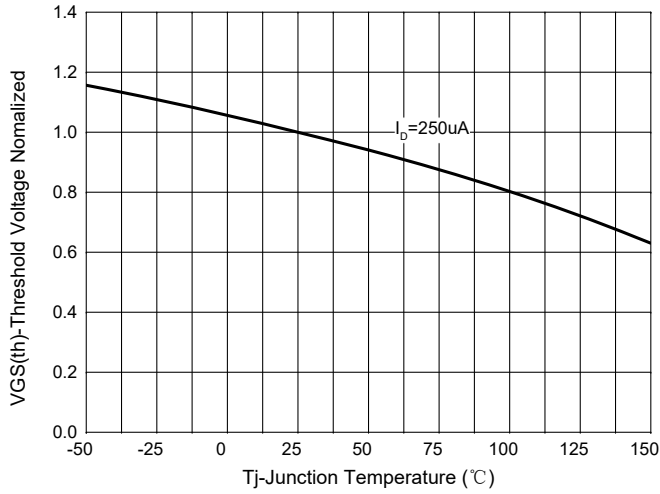


Fig.8-Normalized On Resistance Characteristics

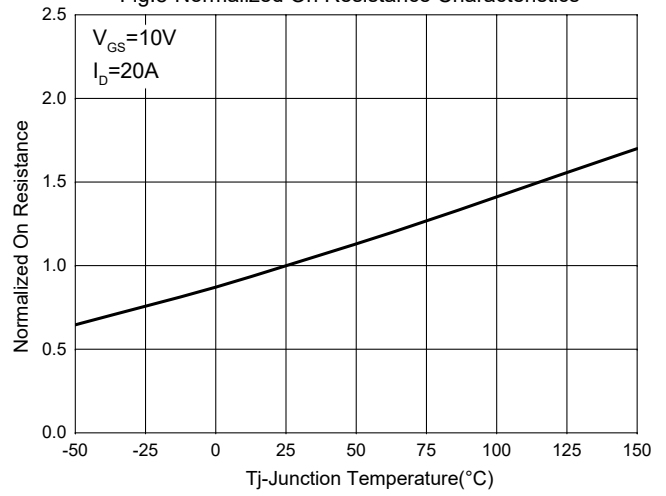


Fig.9 - $I_S - V_{SD}$

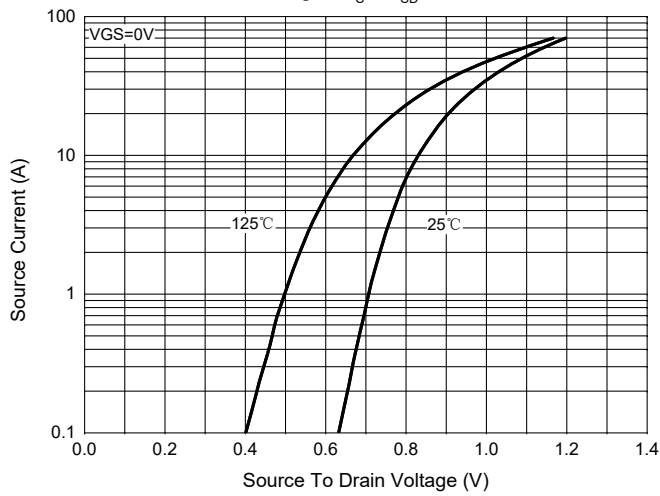


Fig. 10 - Drain Current

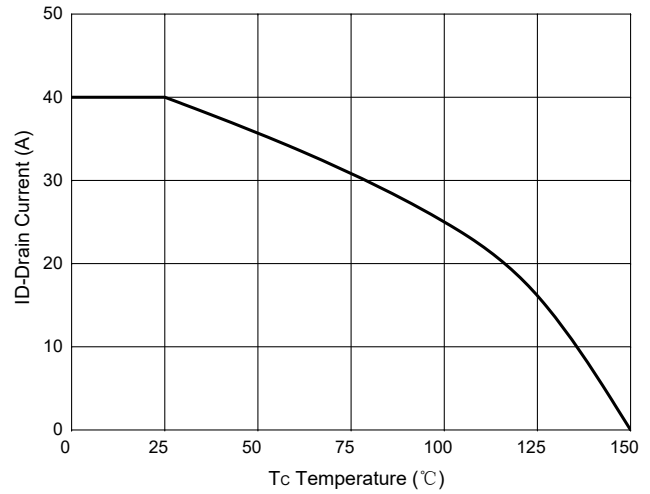
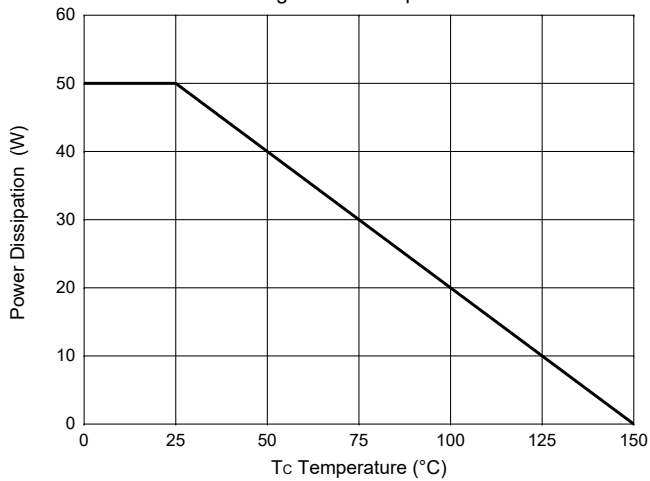


Fig.11-PD Dissipation



Curve Characteristics(N-Channel)

Fig. 12 - Safe Operation Area

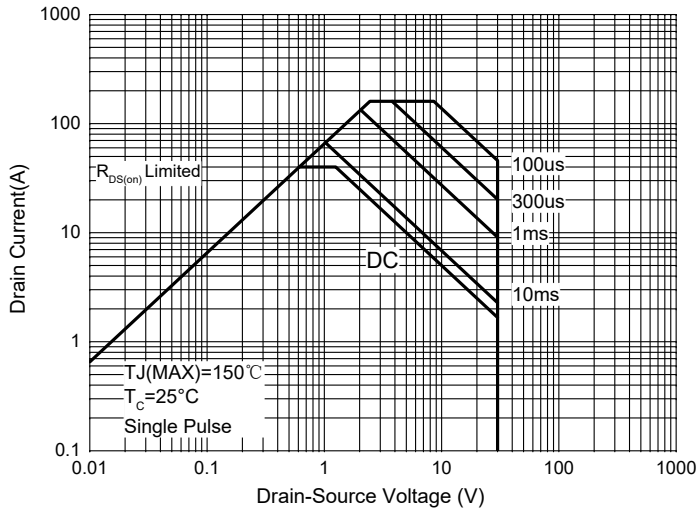
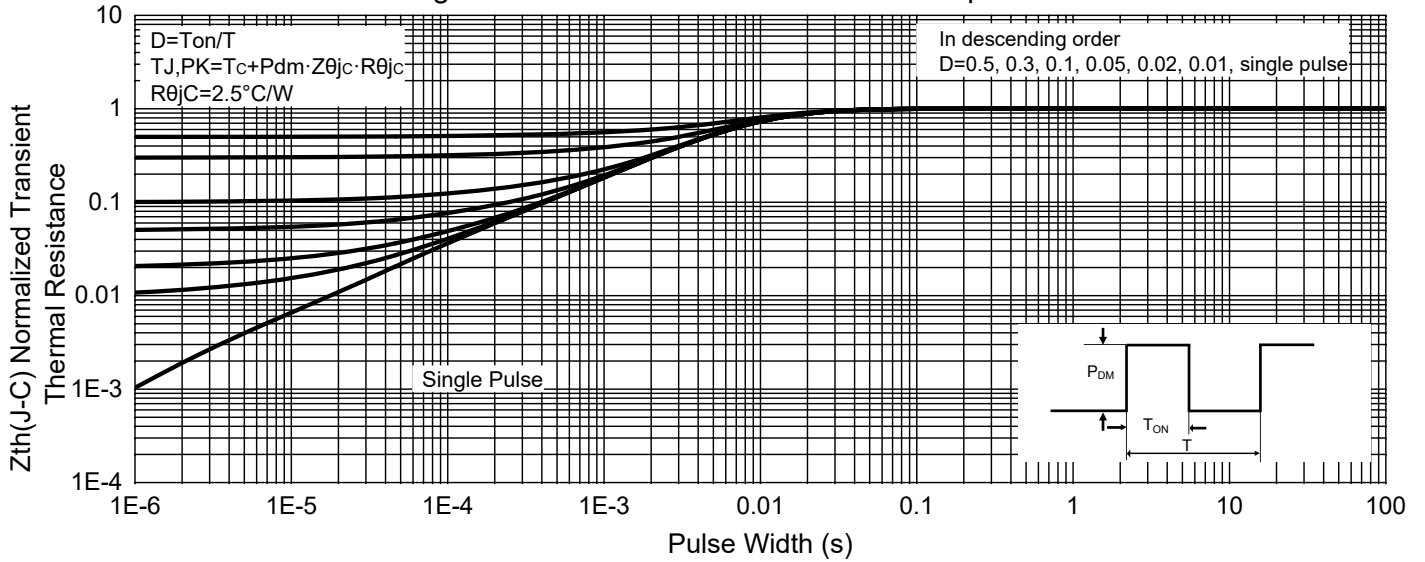


Fig. 13 -Normalized Transient Thermal Impedance



Curve Characteristics(P-Channel)

Fig. 1 - Typical Output Characteristics

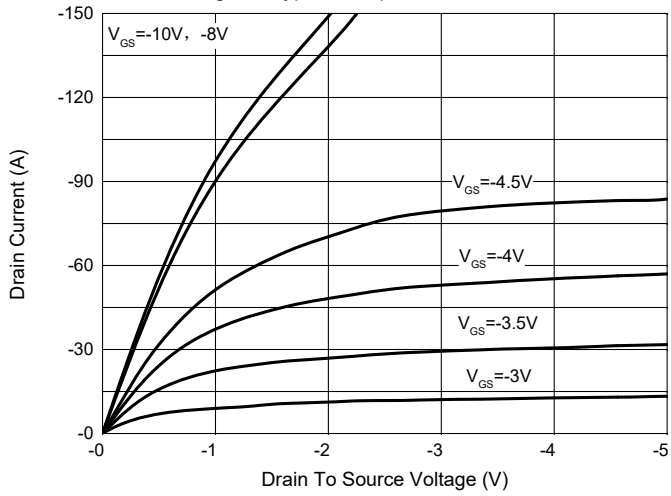


Fig. 2 - Transfer Characteristics

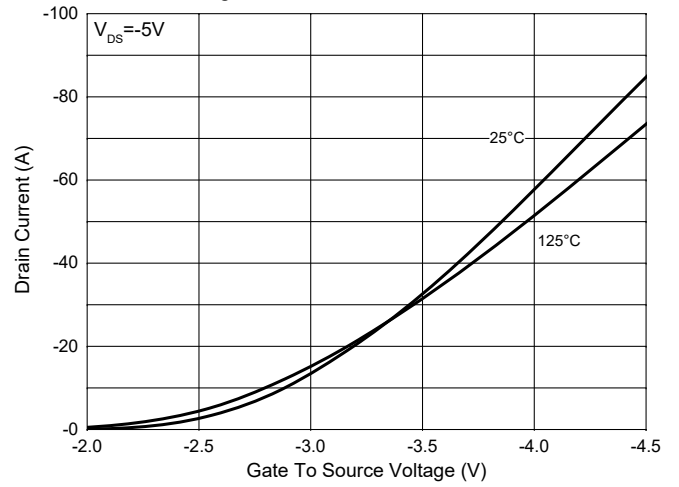


Fig. 3 - $R_{DS(ON)}$ - V_{GS}

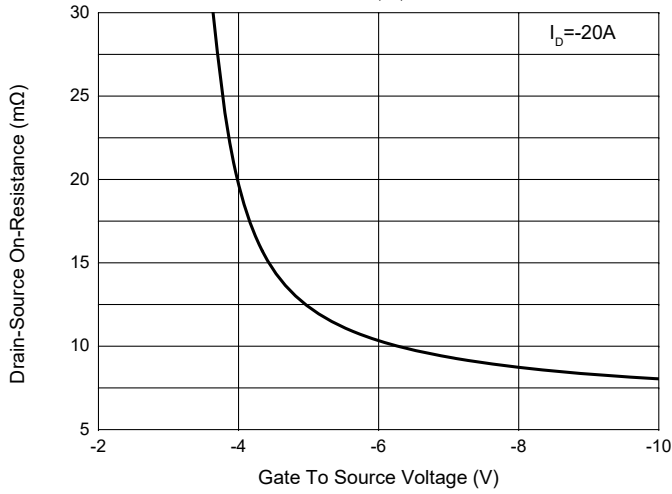


Fig. 4 - $R_{DS(ON)}$ - I_D

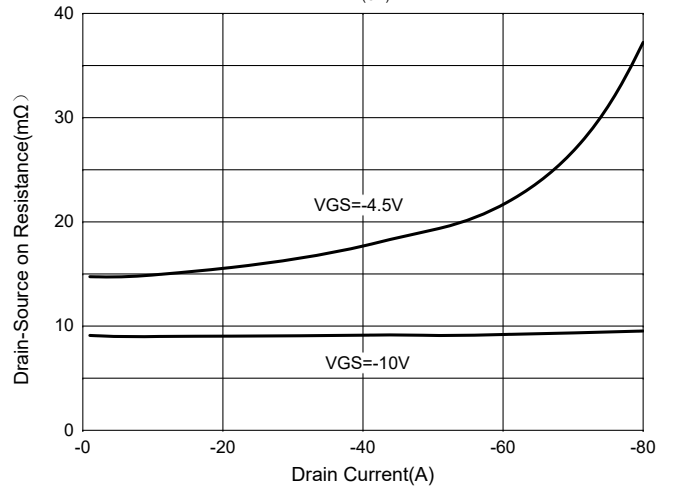


Fig. 5 - Capacitance Characteristics

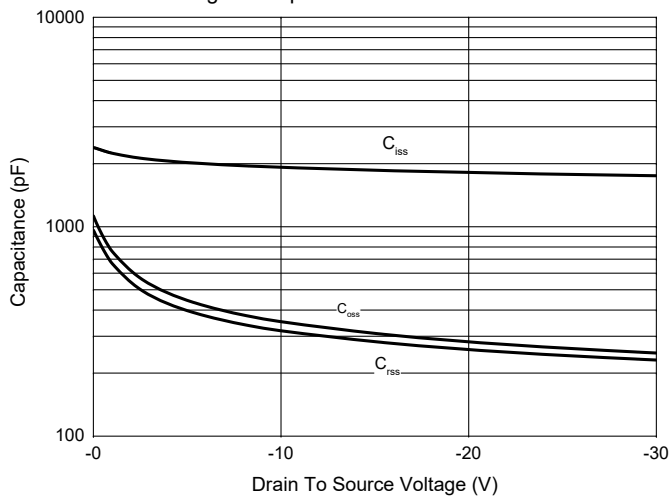
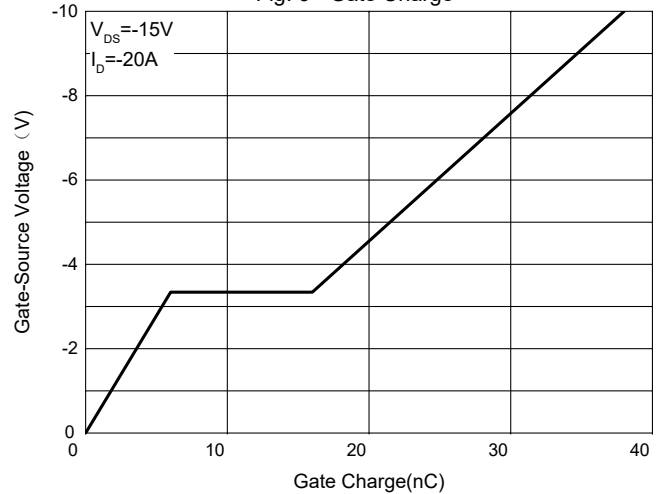


Fig. 6 - Gate Charge



Curve Characteristics(P-Channel)

Fig. 7 - Normalized Threshold Voltage

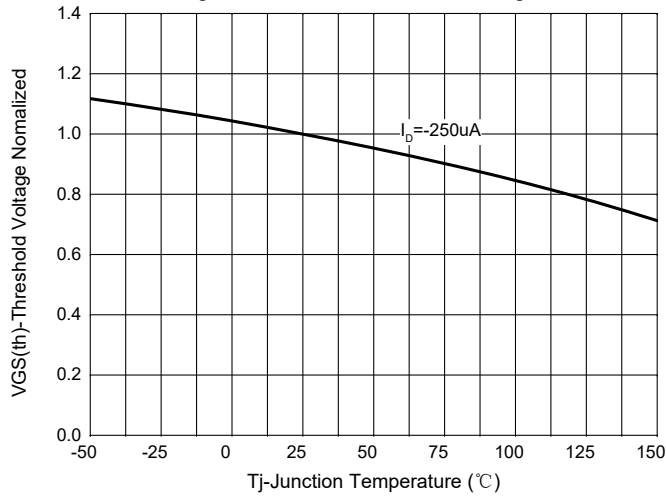


Fig.8-Normalized On Resistance Characteristics

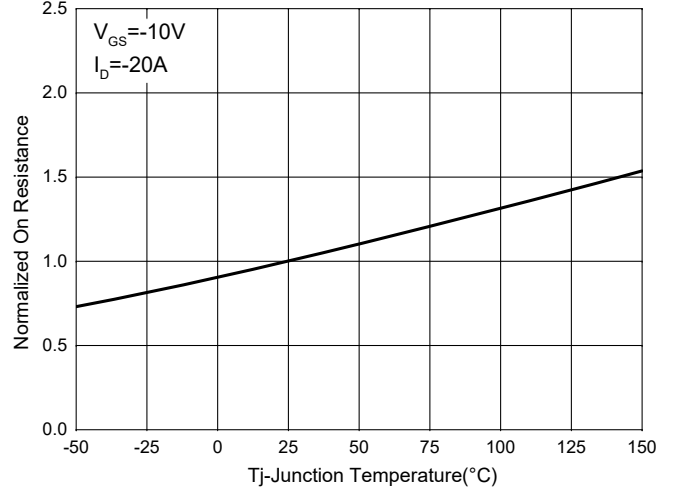


Fig.9 - $I_S - V_{SD}$

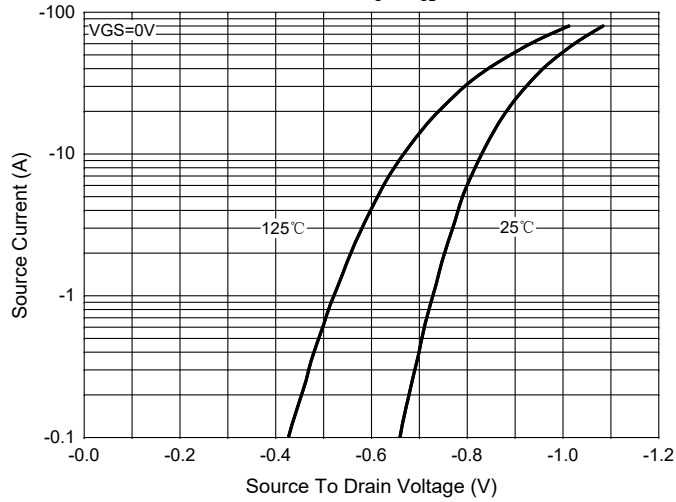


Fig. 10 - Drain Current

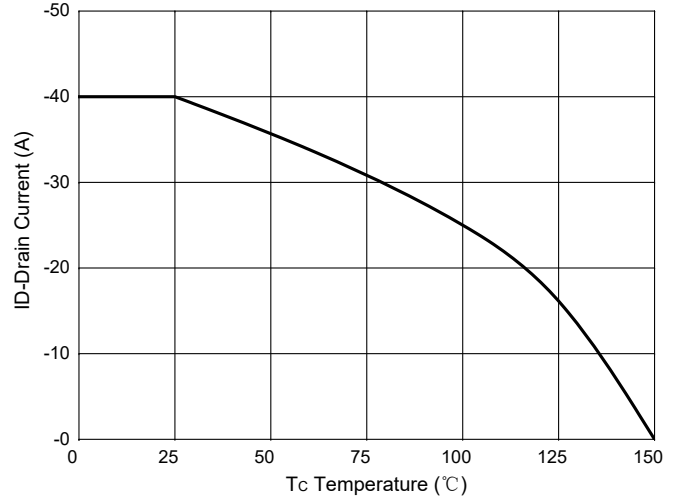
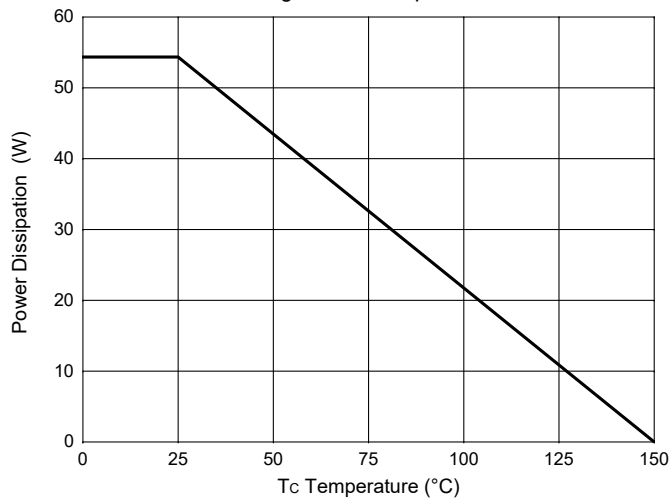


Fig.11-PD Dissipation



Curve Characteristics(P-Channel)

Fig. 12 - Safe Operation Area

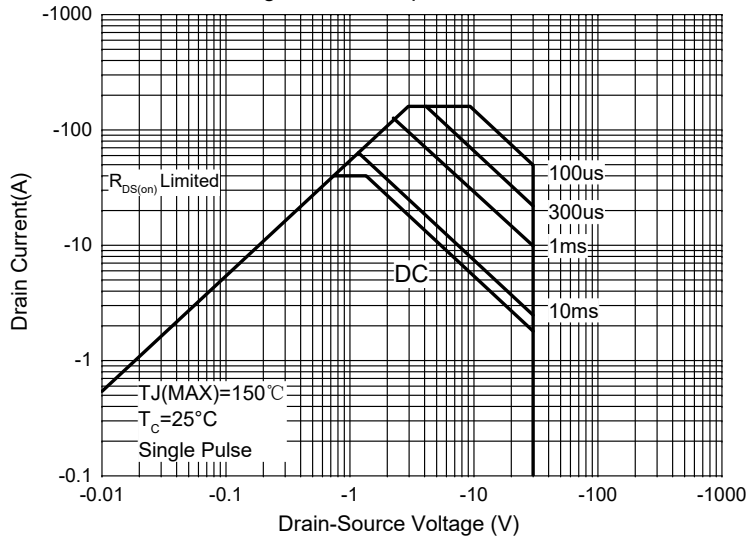
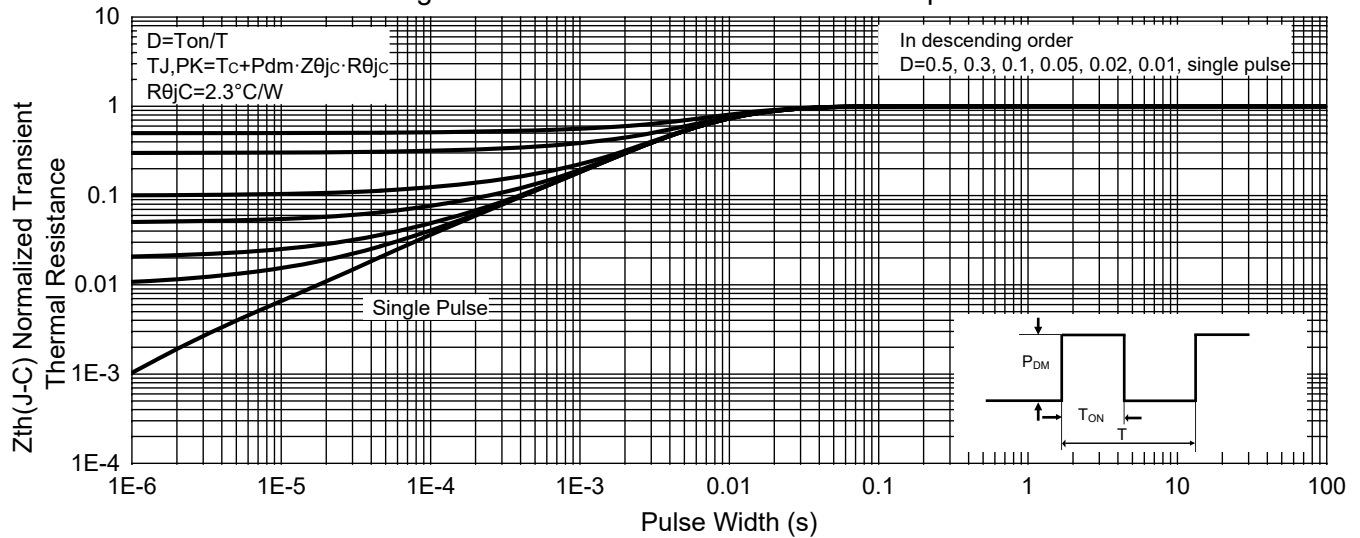


Fig. 13 -Normalized Transient Thermal Impedance



Ordering Information

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

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