

Features

- AEC-Q101 Qualified
- Split Gate Trench MOSFET Technology
- High Density Cell Design For Low $R_{DS(ON)}$
- 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

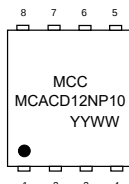
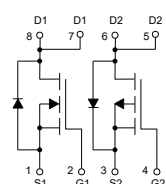
- Operating Junction Temperature Range : -55°C to +150°C
- Storage Temperature Range: -55°C to +150°C
- Thermal Resistance: 50°C/W Junction to Ambient^(Note2)
- NMOS: Thermal Resistance: 1.2°C/W Junction to Case
- PMOS: Thermal Resistance: 1.8°C/W Junction to Case

Parameter	Symbol	Rating	Unit
N-Channel MOSFET			
Drain-Source Voltage	V_{DS}	100	V
Gate-Source Voltage	V_{GS}	±20	V
Continuous Drain Current	$T_C=25^\circ\text{C}$	40	A
	$T_C=100^\circ\text{C}$	25	
Pulsed Drain Current ^(Note 3)	I_{DM}	80	A
Total Power Dissipation ^(Note4)	P_D	104	W
Single Pulsed Avalanche Energy ^(Note5)	E_{AS}	72	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}	-40	A
Total Power Dissipation ^(Note4)	P_D	69	W
Single Pulsed Avalanche Energy ^(Note5)	E_{AS}	36	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 $T_A=25^\circ\text{C}$. The Power dissipation P_{DSM} is based on $R_{\theta JA} \leq 10\text{s}$ and the maximum allowed junction temperature of 150°C. The value in any given application depends on the user's specific board design.
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: $T_J=25^\circ\text{C}$, $V_{DD}=50\text{V}$, $V_{GS}=10\text{V}$, $L=0.5\text{mH}$.
PMOS: $T_J=25^\circ\text{C}$, $V_{DD}=-50\text{V}$, $V_{GS}=-10\text{V}$, $L=10\text{mH}$.

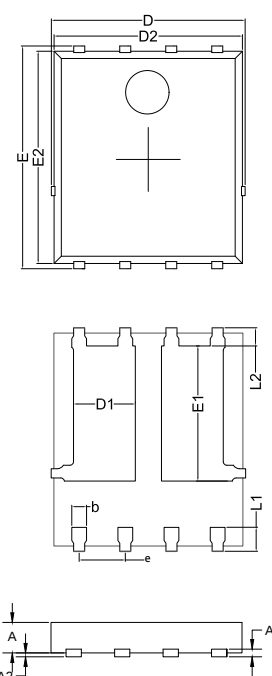
Internal Structure and Marking Code



4 codes in total
YY is the year
WW is the week

Dual N&P-CHANNEL MOSFET

PDFN5060-8D



DIM	INCHES		MM		NOTE
	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 =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		16	24	mΩ
		V _{GS} =4.5V, I _D =5A		18	30	
Gate Resistance	R _G	f=1MHz, Open Drain		1.5		Ω
Diode Characteristics						
Continuous Body Diode Current	I _S				40	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	$V_{(BR)DSS}$	$V_{GS}=0V, I_D=-250\mu A$	-100			V
Gate-Source Leakage Current	I_{GSS}	$V_{DS}=0V, V_{GS}=\pm 20V$			± 100	nA
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS}=-100V, V_{GS}=0V$			-1	μA
Gate-Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=-250\mu A$	-1.2	-1.7	-2.5	V
Drain-Source On-Resistance	$R_{DS(on)}$	$V_{GS}=-10V, I_D=-12A$		85	115	m Ω
		$V_{GS}=-4.5V, I_D=-3A$		92	138	
Gate Resistance	R_G	f=1MHz, Open Drain		10		Ω
Diode Characteristics						
Continuous Body Diode Current	I_S				-18	A
Diode Forward Voltage	V_{SD}	$V_{GS}=0V, I_S=-12A$			-1.2	V
Reverse Recovery Time	t_{rr}	$I_F=-6A, dI_F/dt=100A/\mu s$		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	$t_{d(on)}$	$V_{GS}=-10V, V_{DD}=-50V, I_D=-6A, R_G=2.2\Omega$		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

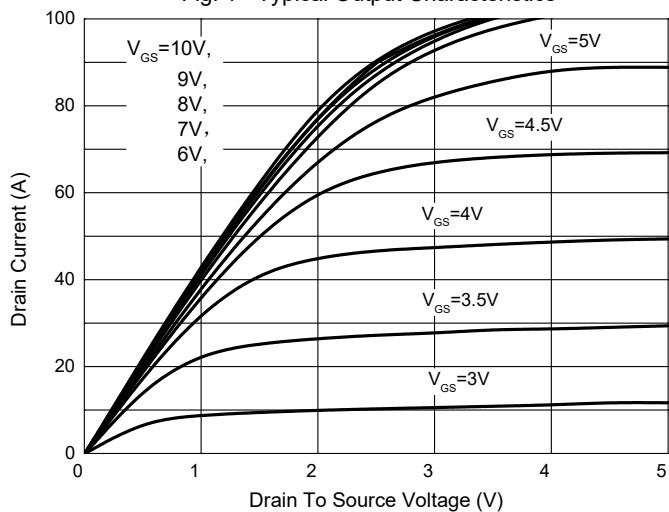


Fig. 2 - Transfer Characteristics

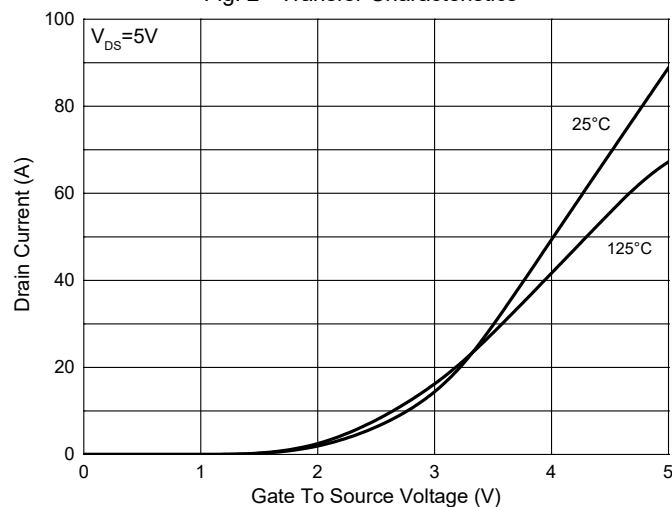


Fig. 3 - $R_{DS(ON)}$ — V_{GS}

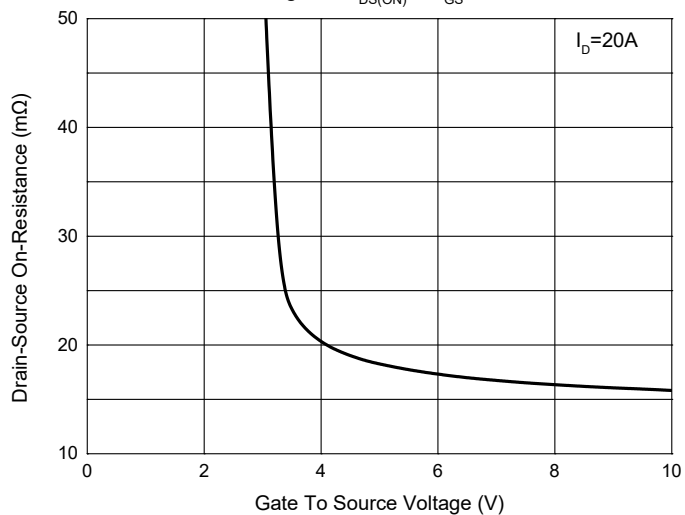


Fig. 4 - $R_{DS(ON)}$ — I_D

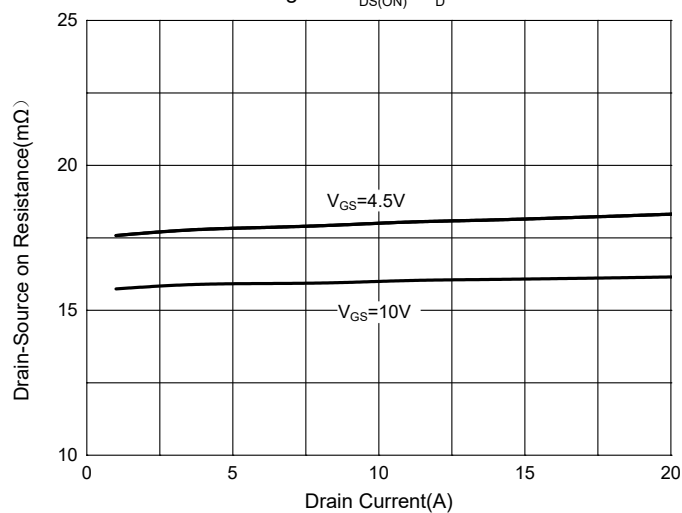


Fig. 5 - Capacitance Characteristics

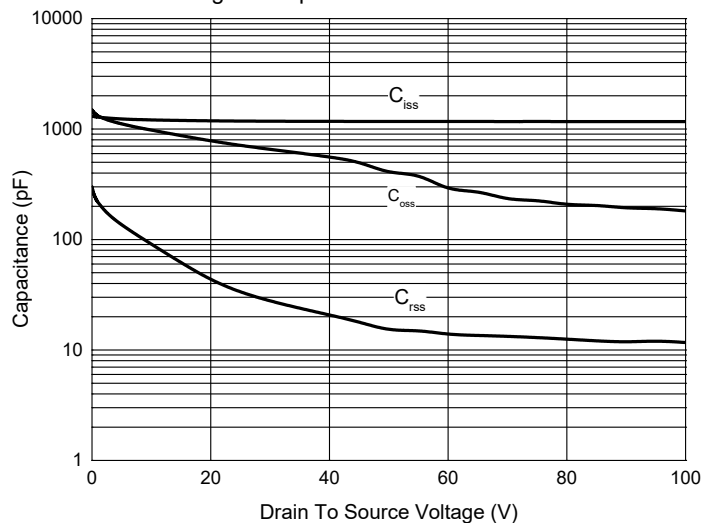
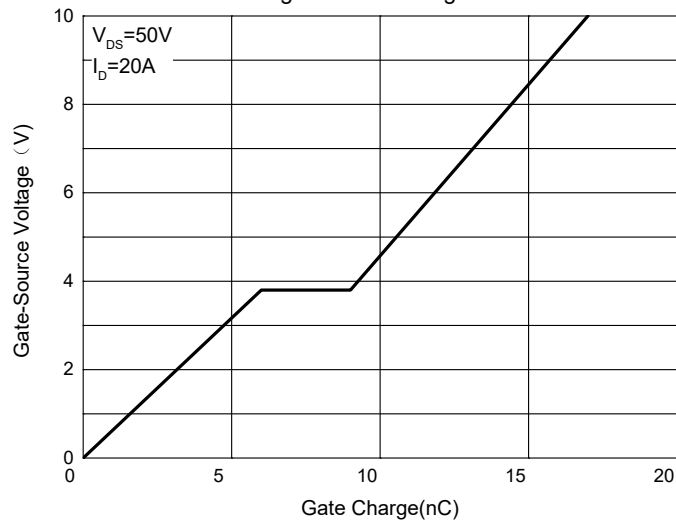


Fig. 6 - Gate Charge



Curve Characteristics(N-Channel)

Fig. 7 - Normalized Threshold Voltage

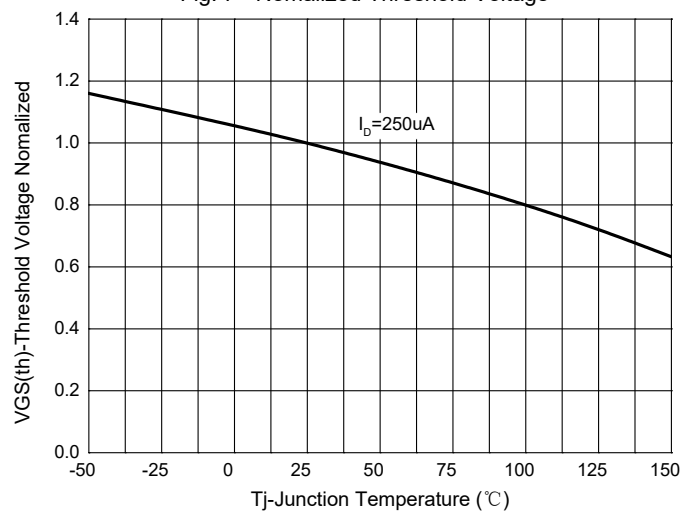


Fig.8-Normalized On Resistance Characteristics

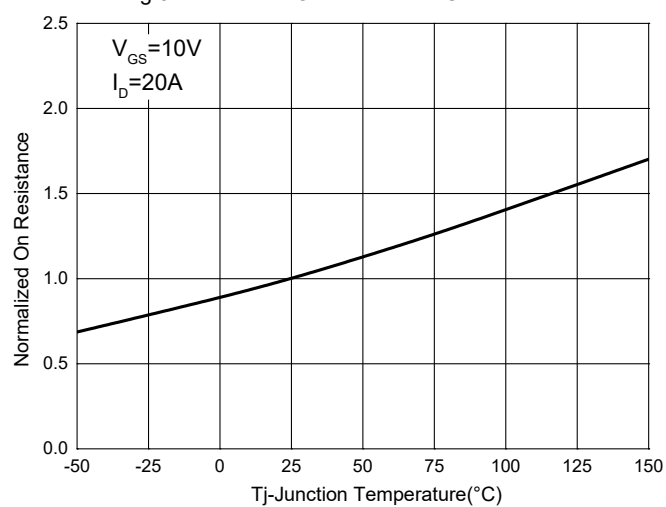


Fig.9 - $I_S - V_{SD}$

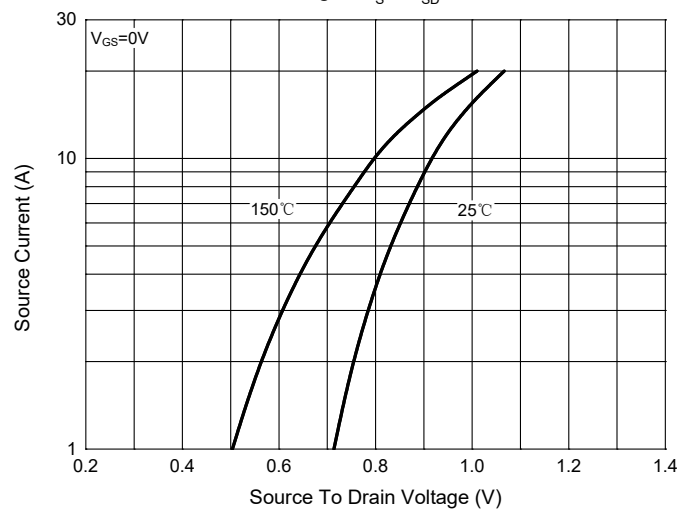


Fig. 10 - Drain Current

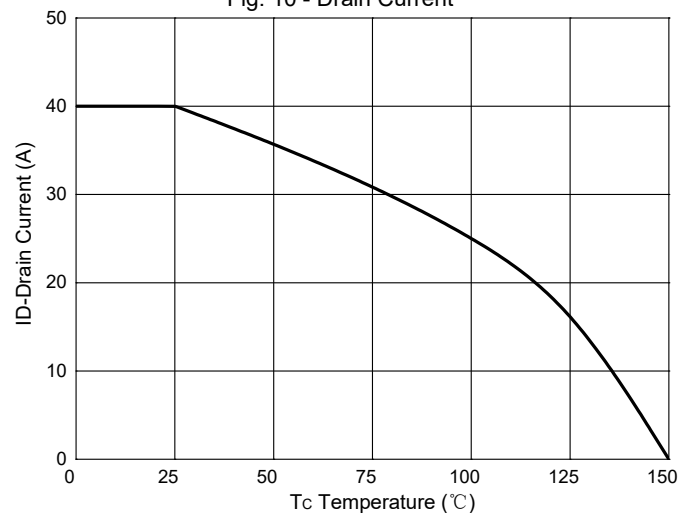
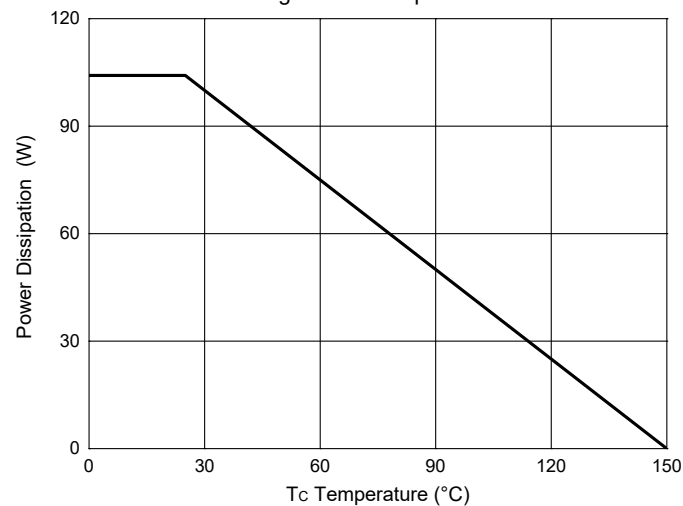


Fig.11-PD Dissipation



Curve Characteristics(N-Channel)

Fig. 12 - Safe Operation Area

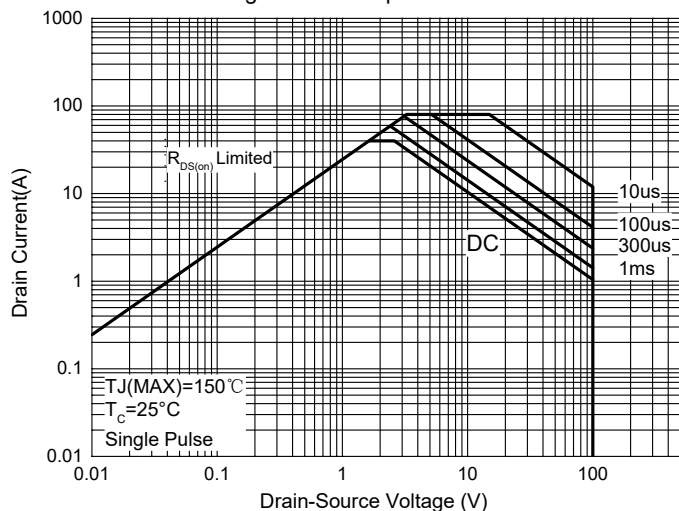
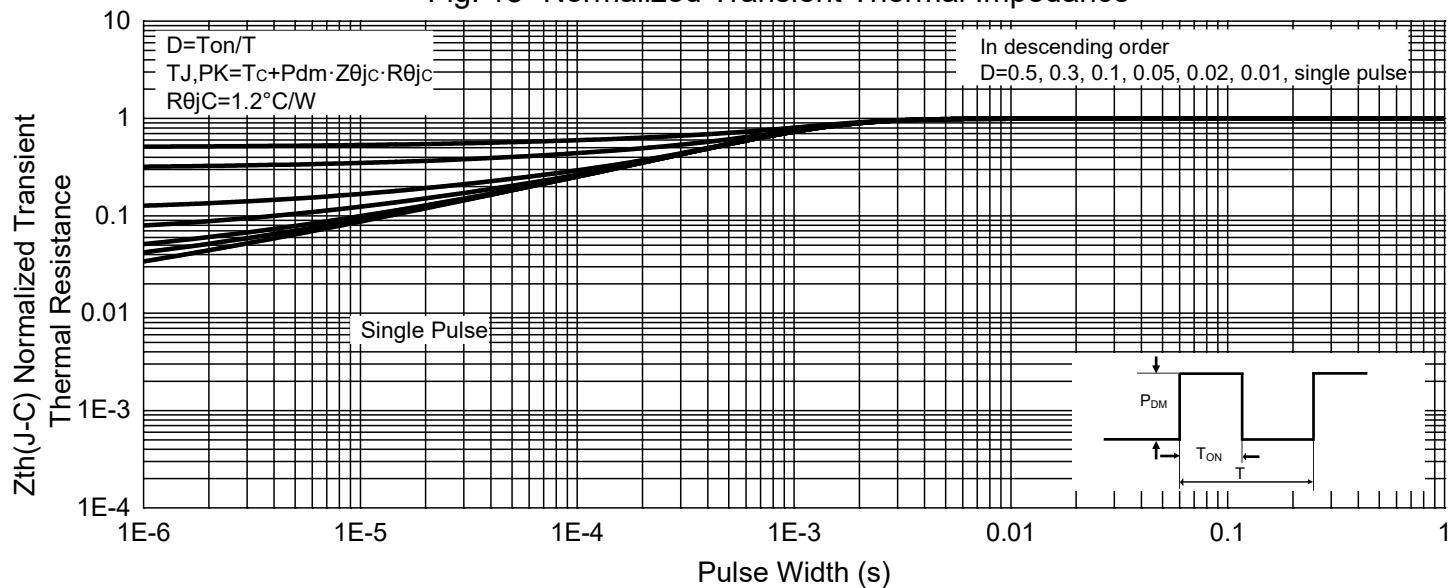


Fig. 13 -Normalized Transient Thermal Impedance



Curve Characteristics(P-Channel)

Fig. 1 - Typical Output Characteristics

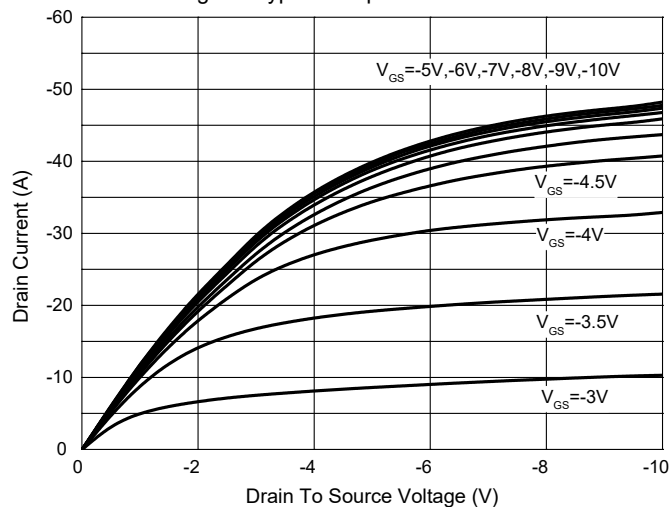


Fig. 2 - Transfer Characteristics

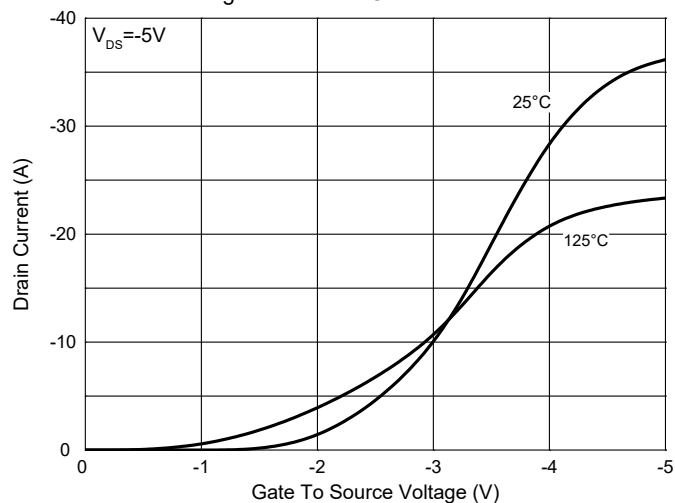


Fig. 3 - $R_{DS(ON)} - V_{GS}$

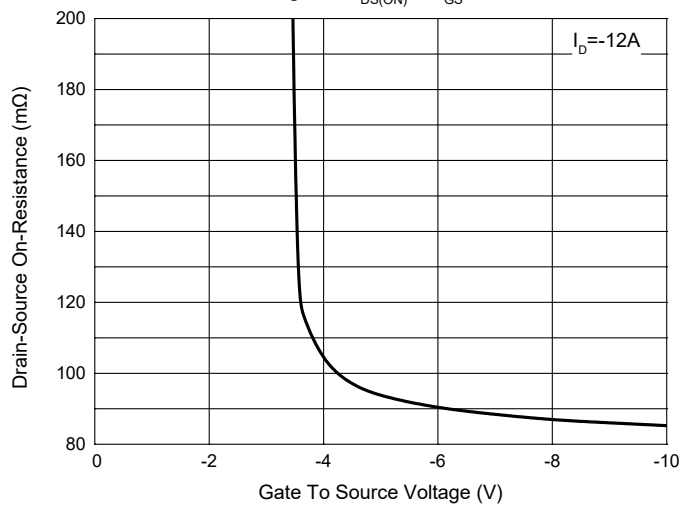


Fig. 4 - $R_{DS(ON)} - I_D$

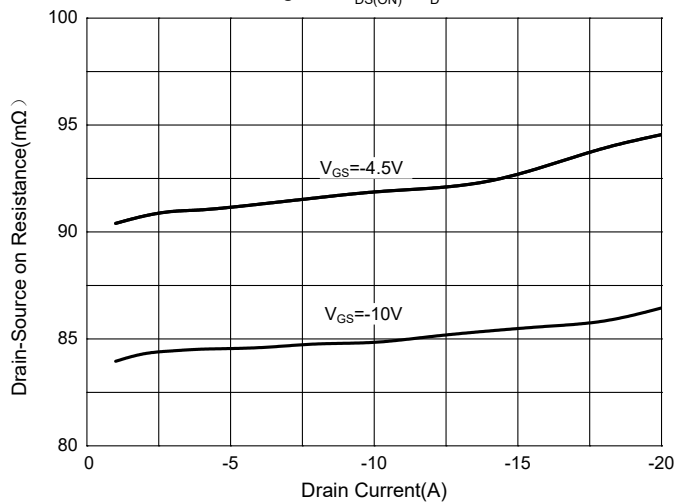


Fig. 5 - Capacitance Characteristics

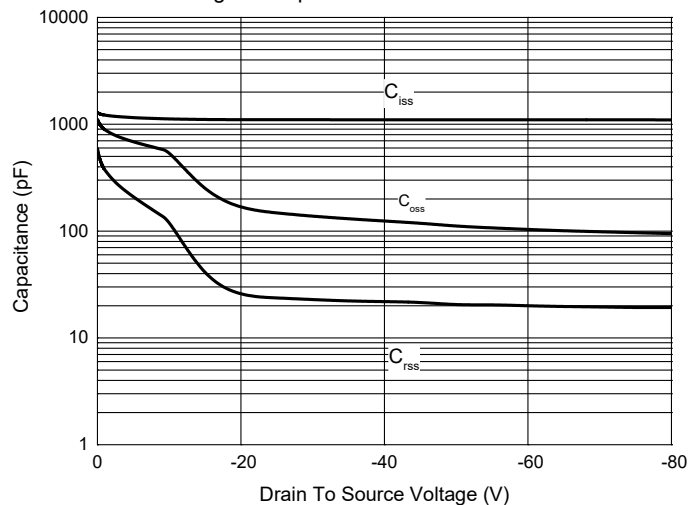
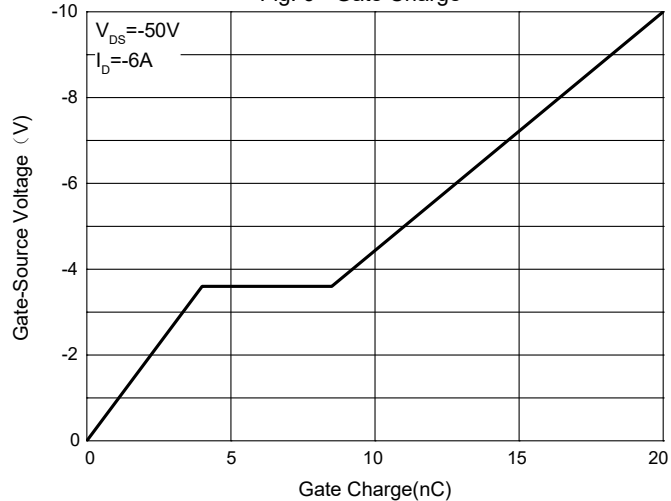


Fig. 6 - Gate Charge



Curve Characteristics(P-Channel)

Fig. 7 - Normalized Threshold Voltage

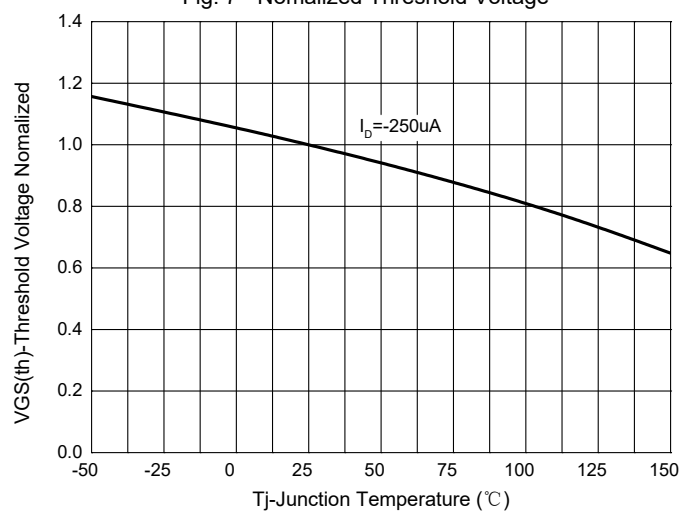


Fig.8-Normalized On Resistance Characteristics

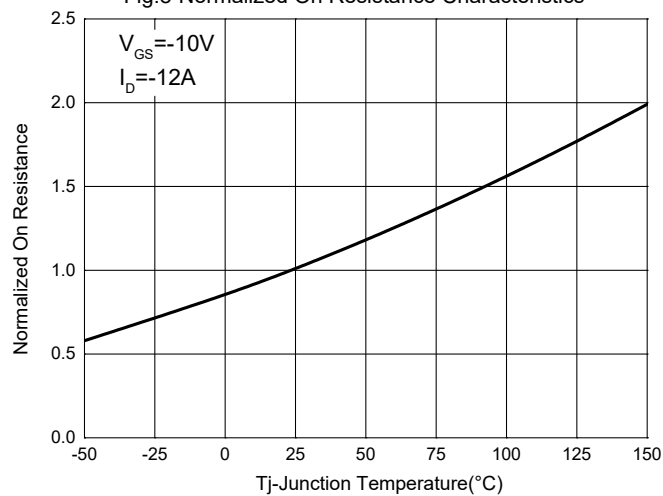


Fig.9 - $I_S - V_{SD}$

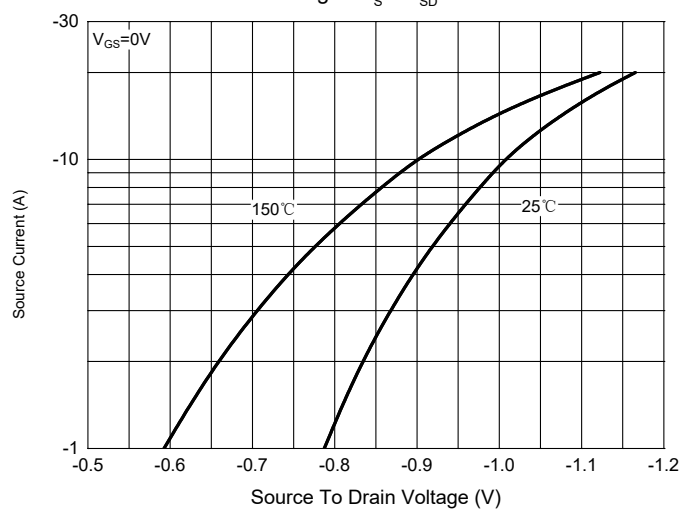


Fig. 10 - Drain Current

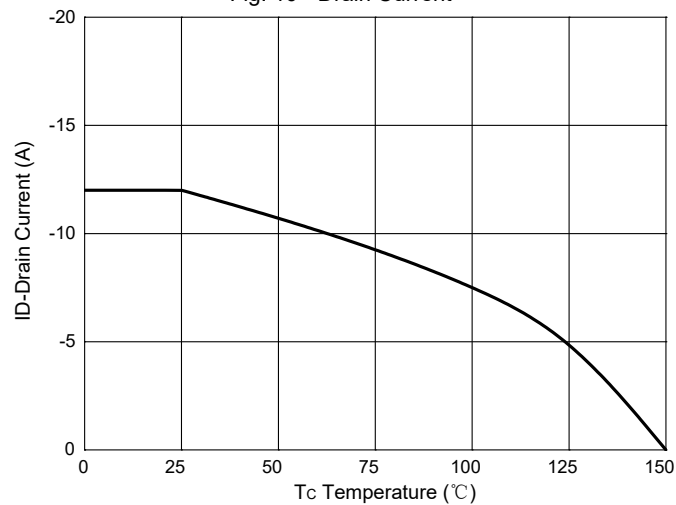
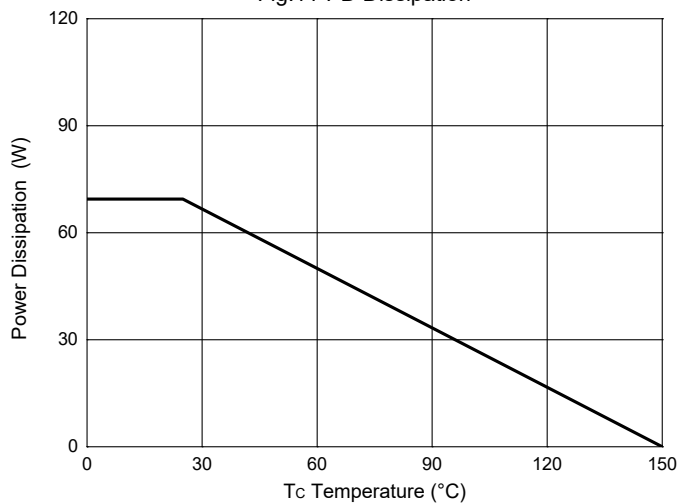


Fig.11-PD Dissipation



Curve Characteristics(P-Channel)

Fig. 12 - Safe Operation Area

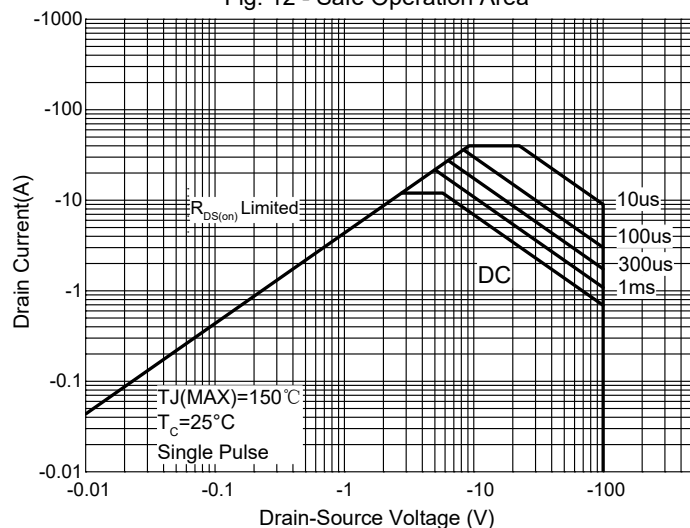
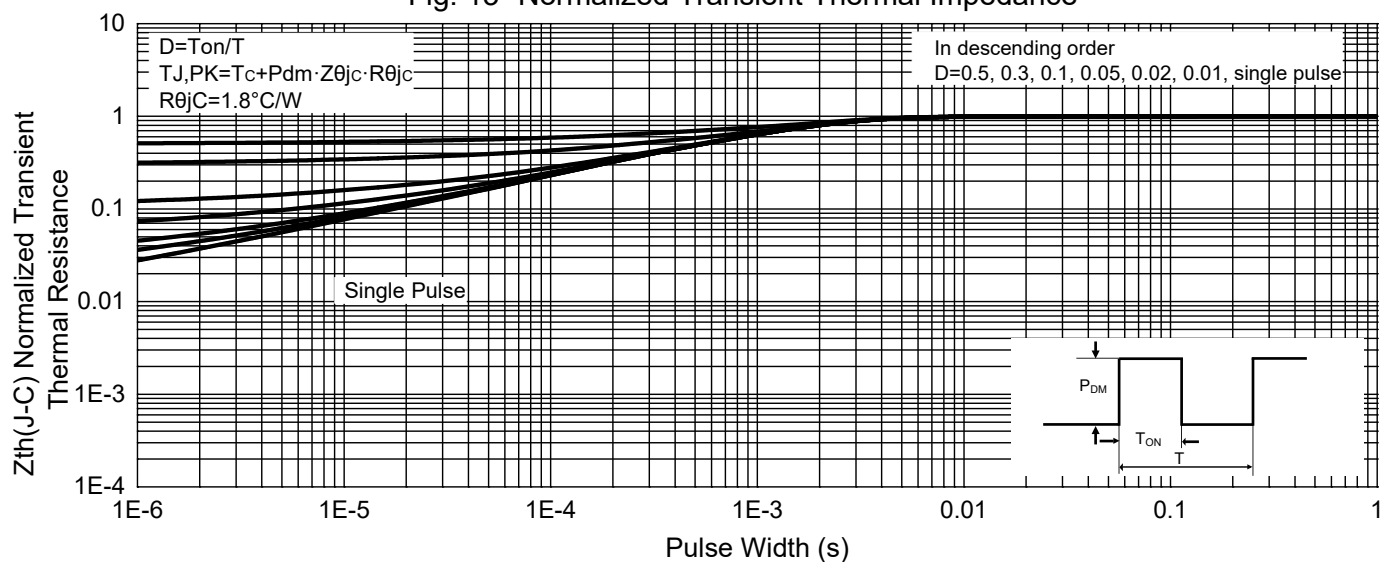


Fig. 13 -Normalized Transient Thermal Impedance



Ordering Information

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

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