

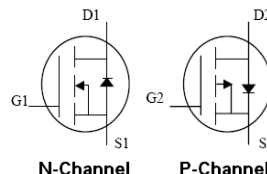
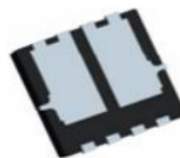
**N And P-Channel Enhancement Mode Power MOSFET****Features**

- Low $R_{DS(on)}$ @ $V_{GS}=5V$
- 5V Logic Level Control
- N+P Dual Channel PDFN5X6-8L Package
- Pb-Free, RoHS Compliant

Key Items	NMOS	PMOS	Unit
BVDSS	30	-30	V
ID	25	-25	A
$R_{DS(on)1}$	13	26	mΩ
$R_{DS(on)2}$	18	38	mΩ

Applications

- DC Fan
- Brushless motor
- Optimized for Power Management Applications for Portable Products, such as H-bridge, Inverters Car Charger and Others

**Order Information**

PDFN5X6-8L

Product	Package	Marking	Packing	Min Unit Quantity
PTN25C03	PDFN5X6-8L	PTN25C03	5000PCS/Reel	5000PCS

Absolute Maximum Ratings

Stresses exceeding Maximum Ratings may damage the device. Maximum Ratings are stress ratings only. Functional operation above the Recommended Operating Conditions is not implied. Extended exposure to stresses above the Recommended Operating Conditions may affect device reliability.

Symbol	Parameter		Rating		Unit
			NMOS	PMOS	
Common Ratings (TC=25°C Unless Otherwise Noted)					
V _{GS}	Gate-Source Voltage		±20	±20	V
V _{(BR)DSS}	Drain-Source Breakdown Voltage		30	-30	V
T _J	Maximum Junction Temperature		150		°C
T _{STG}	Storage Temperature Range		-50 to 150		°C
I _S	Diode Continuous Forward Current ^①	T _C =25°C	25	-25	A
Mounted on Large Heat Sink					
I _{DM}	Pulse Drain Current Tested ^②	T _C =25°C	75	-75	A
I _D	Continuous Drain Current(V _{GS} =10V)	T _C =25°C	25	-25	A
P _D	Maximum Power Dissipation	T _C =25°C	35		W
R _{θJA}	Thermal Resistance Junction-Ambient		3.57		°C/W



N And P-Channel Enhancement Mode Power MOSSFET

N-Channel

Symbol	Parameter	Condition	Min	Typ	Max	Unit
Static Electrical Characteristics @ TJ = 25°C (unless otherwise stated)						
V _{(BR)DSS}	Drain-Source Breakdown Voltage	V _{GS} =0V I _D =250μA	30	--	--	V
I _{DSS}	Zero Gate Voltage Drain Current (Tc=25°C)	V _{DS} =30V,V _{GS} =0V	--	--	1	μA
	Zero Gate Voltage Drain Current (Tc=125°C)	V _{DS} =30V,V _{GS} =0V	--	--	100	μA
I _{GSS}	Gate-Body Leakage Current	V _{GS} =±20V,V _{DS} =0V	--	--	±100	nA
V _{GS(TH)}	Gate Threshold Voltage	V _{DS} =V _{GS} ,I _D =250μA	1.0	1.6	2.5	V
R _{DS(ON)}	Drain-Source On-State Resistance	V _{GS} =10V, I _D =20A	--	--	13	mΩ
R _{DS(ON)}	Drain-Source On-State Resistance	V _{GS} =4.5V, I _D =10A	--	--	18	mΩ
Dynamic Electrical Characteristics @ TJ = 25°C (unless otherwise stated)						
C _{iss}	Input Capacitance	V _{DS} =15V,V _{GS} =0V, f=1MHz	--	970	--	pF
C _{oss}	Output Capacitance		--	197	--	pF
C _{rss}	Reverse Transfer Capacitance		--	113	--	pF
Q _g	Total Gate Charge	V _{DS} =15V,I _D =20A, V _{GS} =10V	--	12	--	nC
Q _{gs}	GateSource Charge		--	3	--	nC
Q _{gd}	GateDrain Charge		--	4	--	nC
Switching Characteristics						
t _{d(on)}	Turnon Delay Time	V _{DD} =15V, I _D =20A, R _G =1.8Ω, V _{GS} =10V	--	6	--	ns
t _r	Turnon Rise Time		--	11	--	ns
t _{d(off)}	TurnOff Delay Time		-	12	--	ns
t _f	TurnOff Fall Time		--	5	--	ns
Source Drain Diode Characteristics						
I _{SD}	Sourcedrain current(Body Diode) ^①	Tc=25°C	--	--	25	A
V _{SD}	Forward on voltage	T _J =25°C,I _{SD} =20A, V _{GS} =0V	--	0.82	1.2	V

Notes:

① Pulse test ; Pulse width≤300μs, duty cycle≤2%.

② Pulse width limited by maximum allowable junction temperature



N And P-Channel Enhancement Mode Power MOSSFET

P-Channel

Symbol	Parameter	Condition	Min	Typ	Max	Unit
Static Electrical Characteristics @ TJ = 25°C (unless otherwise stated)						
V _{(BR)DSS}	Drain-Source Breakdown Voltage	V _{GS} =0V I _D =-250μA	-30	--	--	V
I _{DSS}	Zero Gate Voltage Drain Current (Tc=25°C)	V _{DS} =-30V, V _{GS} =0V	--	--	1	μA
	Zero Gate Voltage Drain Current (Tc=125°C)	V _{DS} =-30V, V _{GS} =0V	--	--	100	μA
I _{GSS}	Gate-Body Leakage Current	V _{GS} =±20V, V _{DS} =0V	--	--	±100	nA
V _{GS(TH)}	Gate Threshold Voltage	V _{DS} =V _{GS} , I _D =-250μA	-1.0	-2.0	-2.5	V
R _{DS(ON)}	Drain-Source On-State Resistance	V _{GS} =-10V, I _D =-10.5A	--	--	26	mΩ
R _{DS(ON)}	Drain-Source On-State Resistance	V _{GS} =-5V, I _D =-6A	--	--	38	mΩ
Dynamic Electrical Characteristics @ TJ = 25°C (unless otherwise stated)						
C _{iss}	Input Capacitance	V _{DS} =-15V, V _{GS} =0V, f=1MHz	--	3980	--	pF
C _{oss}	Output Capacitance		--	450	--	pF
C _{rss}	Reverse Transfer Capacitance		--	420	--	pF
Q _g	Total Gate Charge	V _{DS} =-15V, I _D =-15A, V _{GS} =-10V	--	81	--	nC
Q _{gs}	Gate-Source Charge		--	12	--	nC
Q _{gd}	Gate-Drain Charge		--	9.7	--	nC
Switching Characteristics						
t _{d(on)}	Turn-on Delay Time	V _{DD} =-15V, I _D =-15A , R _G = 3Ω, V _{GS} =-10V	--	17	--	ns
t _r	Turn-on Rise Time		--	21	--	nS
t _{d(off)}	Turn-Off Delay Time		--	36	--	nS
t _f	Turn-Off Fall Time		--	15	--	nS
Source- Drain Diode Characteristics						
I _{SD}	Source-drain current(Body Diode)	T _c =25°C	--	--	-25	A
V _{SD}	Forward on voltage	T _j =25°C, I _{SD} =-20A V _{GS} =0V	--	-0.80	-1.2	V

Notes:

① Pulse test ; Pulse width $\leq 300\mu s$, duty cycle $\leq 2\%$.

3 ② Pulse width limited by maximum allowable junction temperature.



N And P-Channel Enhancement Mode Power MOSFET

N-Channel Typical Characteristics

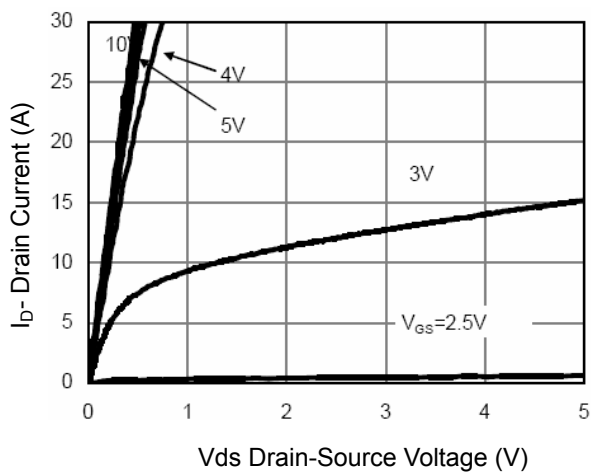


Figure 1 Output Characteristics

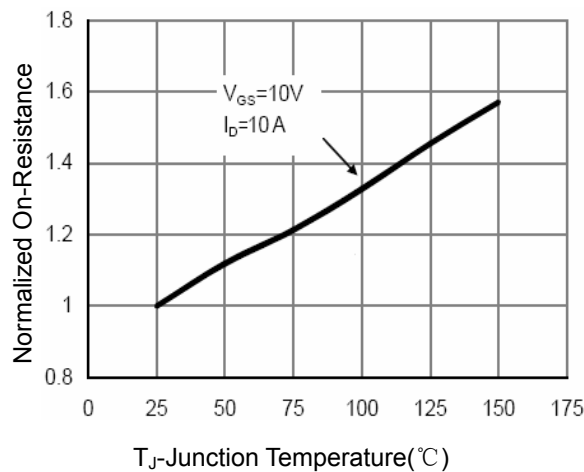


Figure 4 Rdson-Junction Temperature

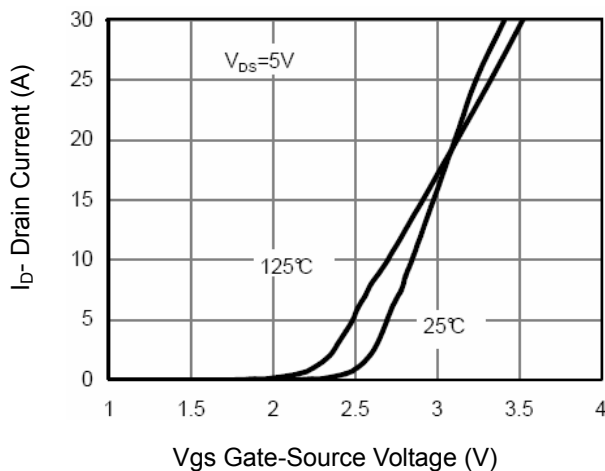


Figure 2 Transfer Characteristics

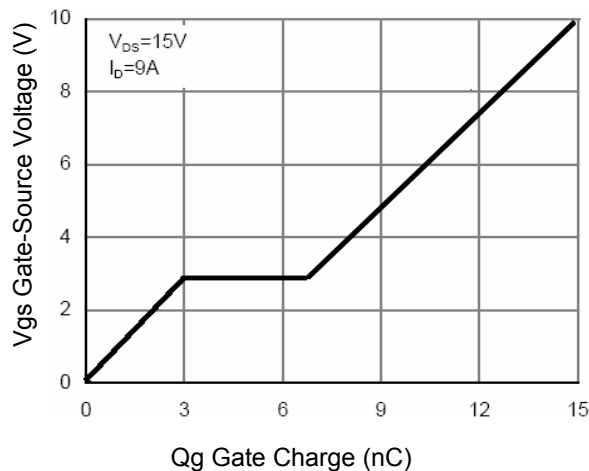


Figure 5 Gate Charge

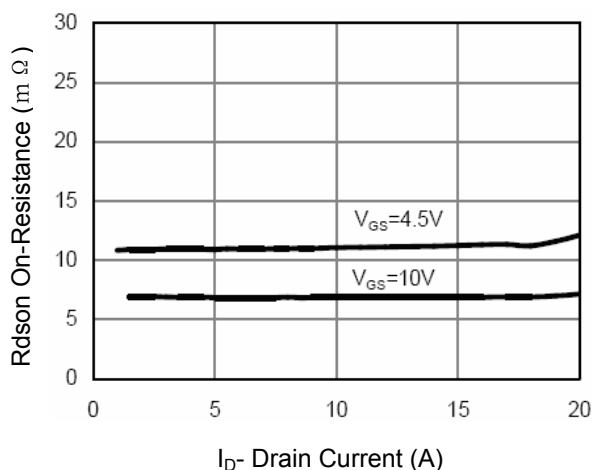


Figure 3 Rdson- Drain Current

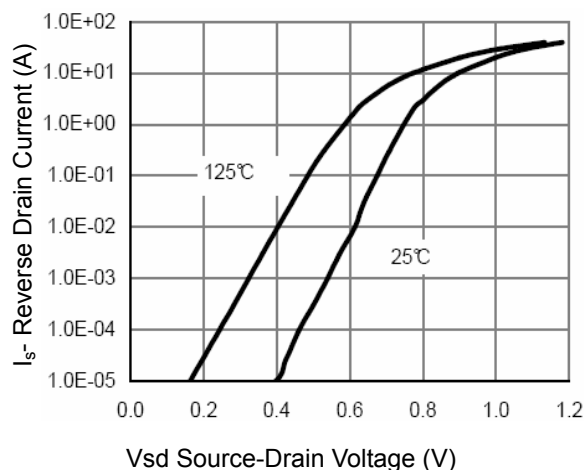
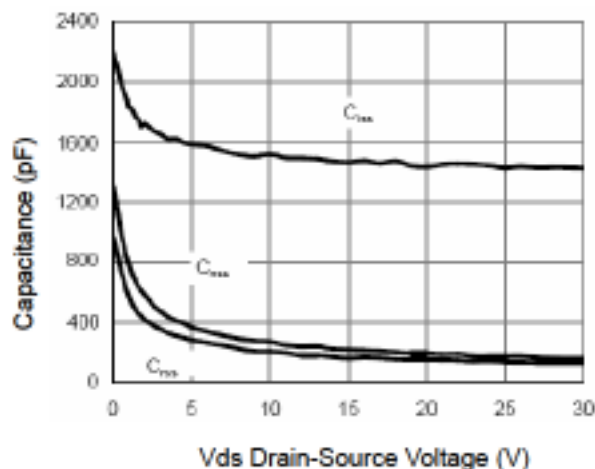
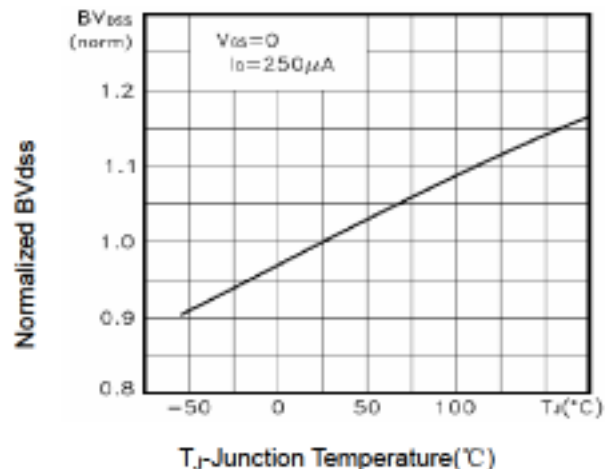
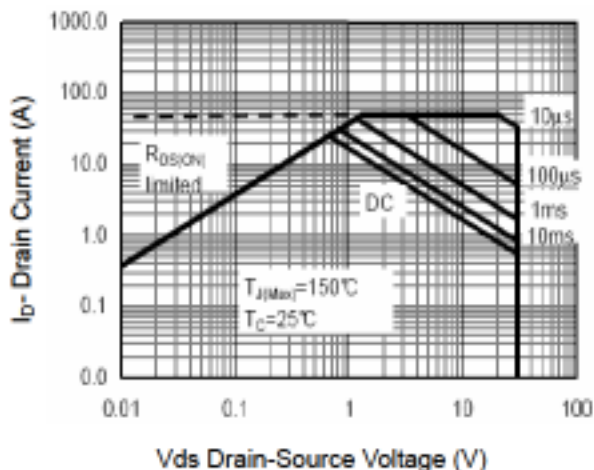
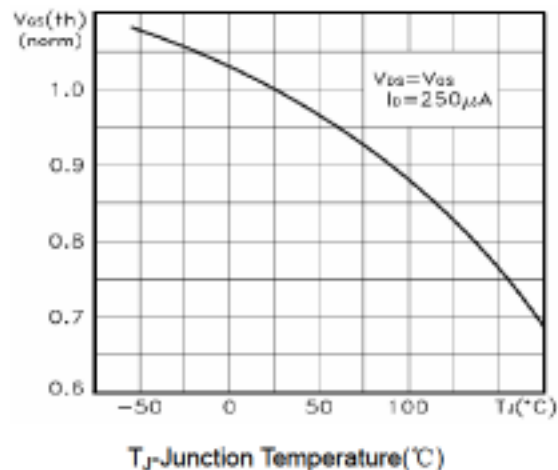
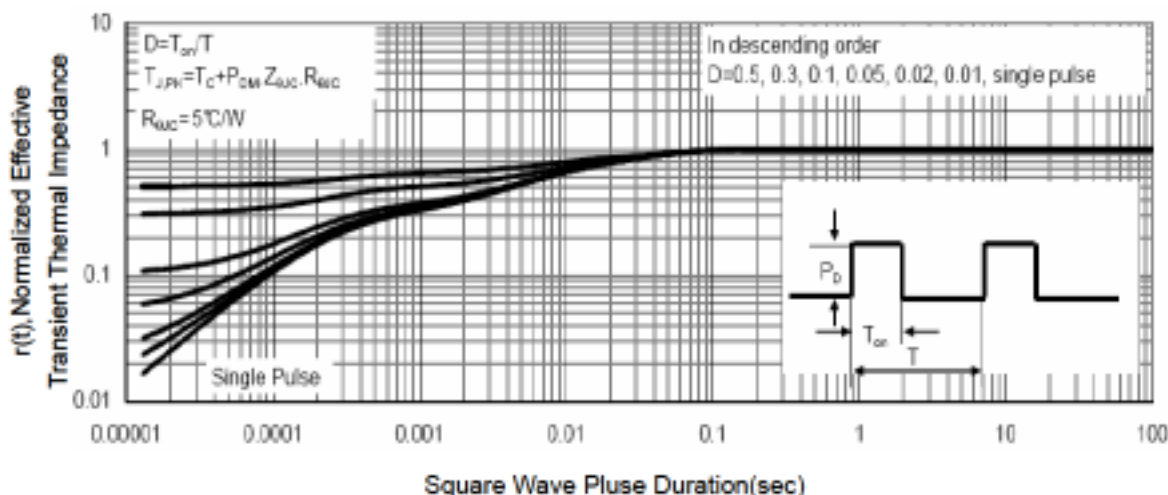


Figure 6 Source- Drain Diode Forward

N And P-Channel Enhancement Mode Power MOSSFET

N-Channel Typical Characteristics


Figure 7 Capacitance vs Vds

Figure 9 BV_{DSS} vs Junction Temperature

Figure 8 Safe Operation Area

Figure 10 V_{GS(th)} vs Junction Temperature

Figure 11 Normalized Maximum Transient Thermal Impedance

N And P-Channel Enhancement Mode Power MOSSFET

P-Channel Typical Characteristics

Typical Electrical and Thermal Characteristics

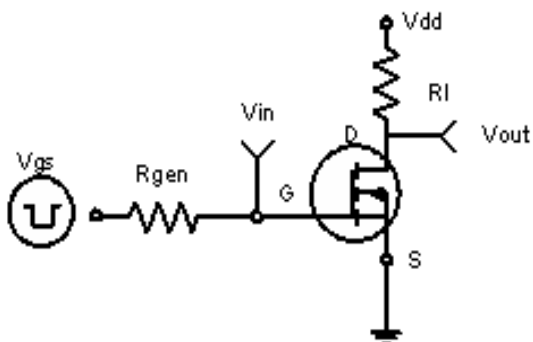


Figure 1 Switching Test Circuit

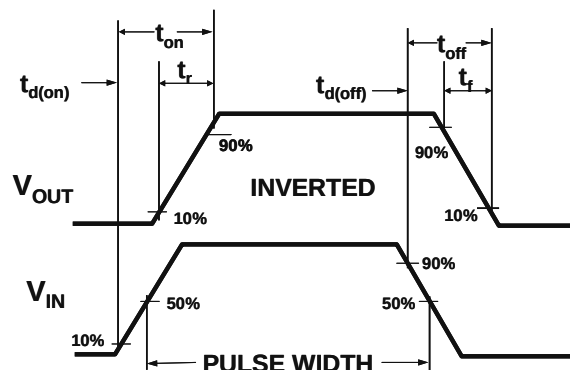


Figure 2 Switching Waveforms

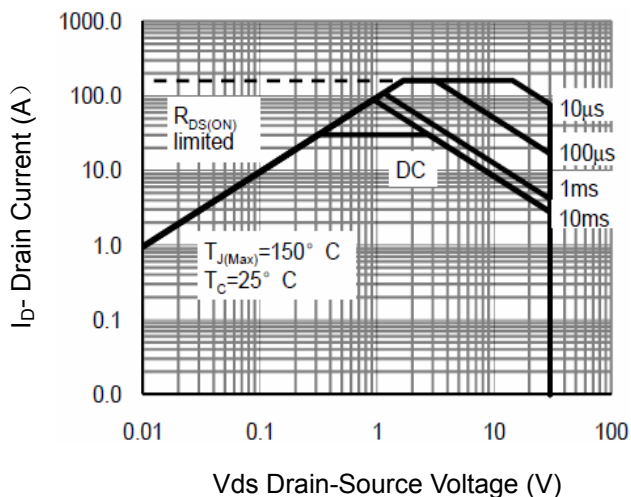


Figure 3 Safe Operation Area

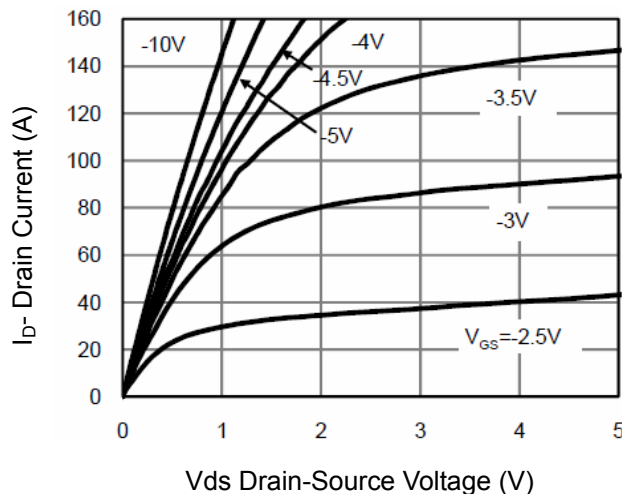


Figure 4 Output Characteristics

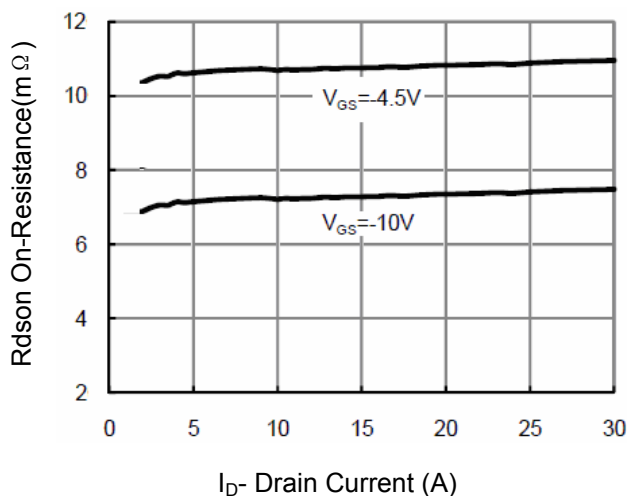


Figure 5 Drain-Source On-Resistance

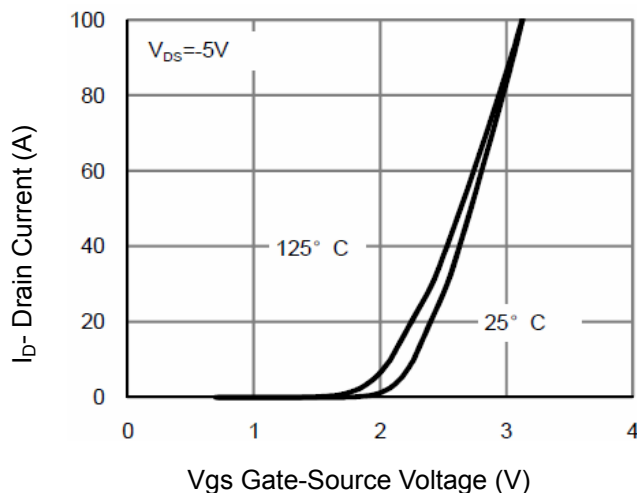
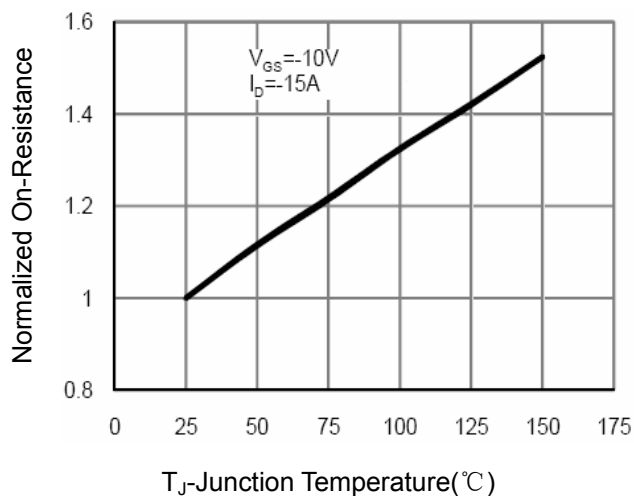
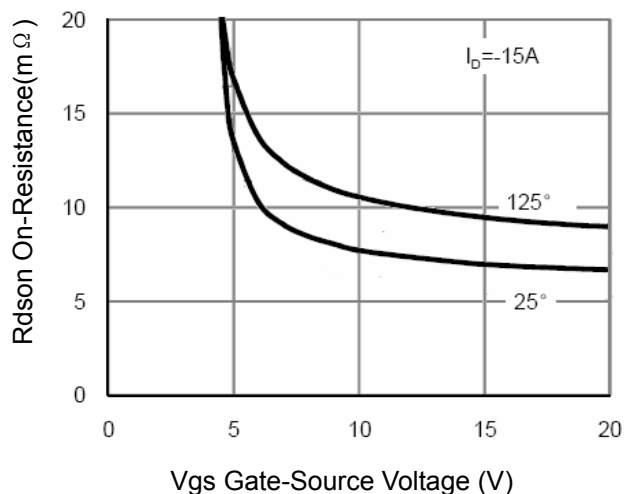
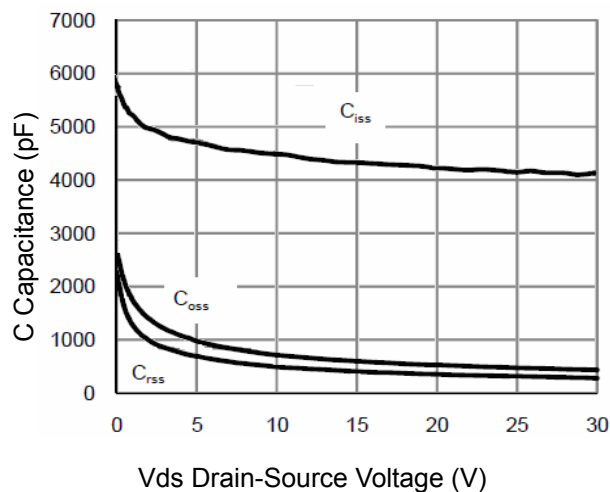
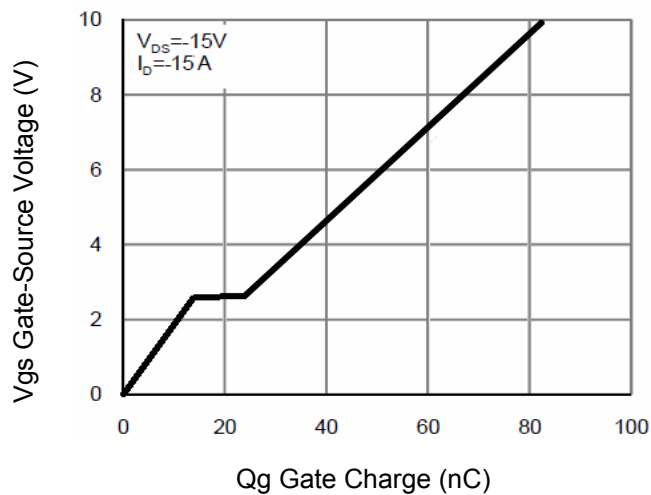
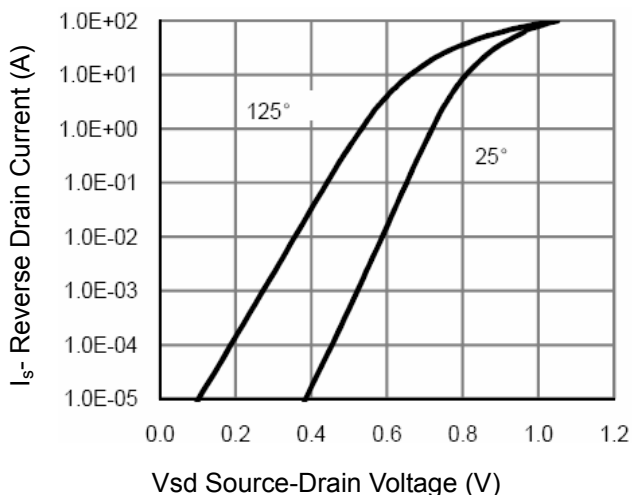


Figure 6 Transfer Characteristics

N And P-Channel Enhancement Mode Power MOSSFET

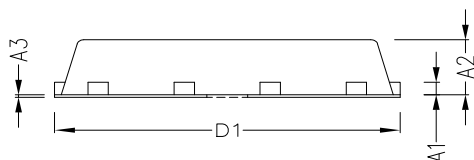
P-Channel Typical Characteristics


Figure 7 Drain-Source On-Resistance

Figure 8 Rdson vs Vgs

Figure 9 Capacitance vs Vds

Figure 10 Gate Charge

Figure 11 Source- Drain Diode Forward

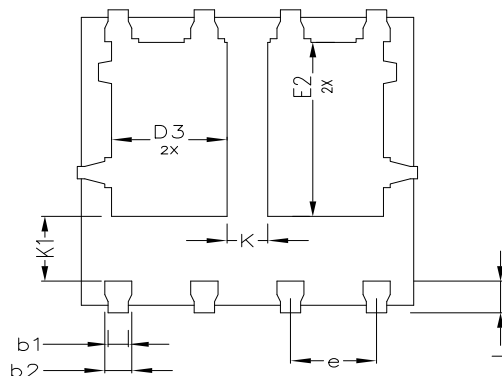


N And P-Channel Enhancement Mode Power MOSSFET

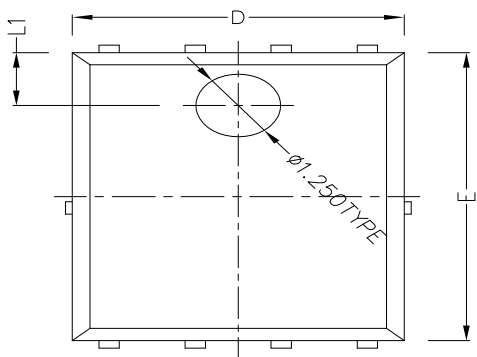
PDFN5X6-8L Package Outline Dimensions (Units: mm)



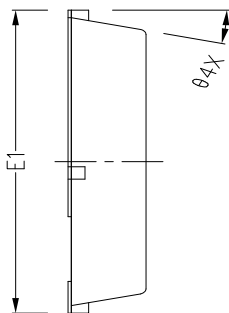
SIDE VIEW



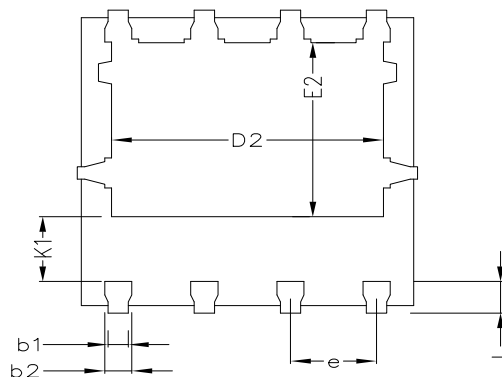
BOTTOM VIEW
OPTION 2



TOP VIEW



SIDE VIEW



BOTTOM VIEW
OPTION 1

COMMON DIMENSIONS (UNITS OF MEASURE IS mm)			
	MIN	NORMAL	MAX
A1	0.254 BSC		
A2	1.000	1.100	1.200
A3	0.005	—	0.020
b1	0.250	0.300	0.350
b2	0.350	0.400	0.450
D	4.800	4.900	5.000
D1	5.000	5.100	5.200
D2	3.910	4.010	4.110
D3	1.605	1.705	1.805
E	5.650	5.750	5.850
E1	5.950	6.050	6.150
E2	3.375	3.475	3.575
e	1.270 TYPE		
L	0.530	0.630	0.730
L1	1.00REF		
θ	13° TYPE		
K	0.600 REF		
K1	1.235 REF		