

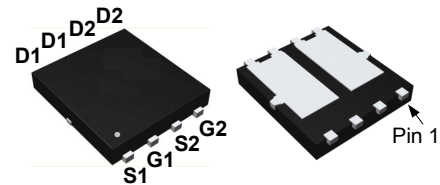
Features

- N Channel (Integrated Schottky Diode)**
30V/45A,
 $R_{DS(ON)} = 7 \text{ m}\Omega \text{ (typ.) @ } V_{GS} = 10\text{V}$
 $R_{DS(ON)} = 9 \text{ m}\Omega \text{ (typ.) @ } V_{GS} = 4.5\text{V}$
- P Channel**
-30V/-45A,
 $R_{DS(ON)} = 10 \text{ m}\Omega \text{ (typ.) @ } V_{GS} = -10\text{V}$
 $R_{DS(ON)} = 13 \text{ m}\Omega \text{ (typ.) @ } V_{GS} = -4.5\text{V}$
- 100% UIS + R_g Tested
- Reliable and Rugged
- Lead Free Available (RoHS Compliant)

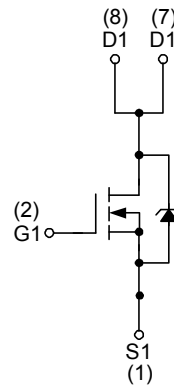
Applications

- Synchronous Rectification.
- Motor Control.
- High Current, High Speed Switching.
- Portable equipment application.

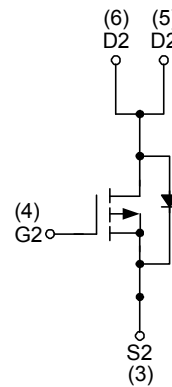
Pin Description



PDFN5*6-8L



N-Channel MOSFET



P-Channel MOSFET

Absolute Maximum Ratings ($T_A = 25^\circ\text{C}$ unless otherwise noted)

Symbol	Parameter		N Channel	P Channel	Unit
V _{DSS}	Drain-Source Voltage		30	-30	V
V _{GSS}	Gate-Source Voltage		±20	±20	
T _J	Maximum Junction Temperature		150		°C
T _{STG}	Storage Temperature Range		-55 to 150		
I _S	Diode Continuous Forward Current	T _C =25°C	45	-45	A
I _D	Continuous Drain Current	T _C =25°C	45	-45	A
		T _C =100°C	33.8	-33.8	
P _D	Maximum Power Dissipation	T _C =25°C	18.9		W
		T _C =100°C	7.6		
R _{θJC}	Thermal Resistance-Junction to Case	Steady State	6.6		°C/W
R _{θJA} ^b	Thermal Resistance-Junction to Ambient	t ≤ 10s	45		°C/W
		Steady State	95		°C/W
I _{AS} ^c	Avalanche Current, Single pulse	L=0.1mH	13	19	A
E _{AS} ^c	Avalanche Energy, Single pulse	L=0.1mH	8.5	18	mJ

Note a : Pulse width limited by max. junction temperature.

Note b : Surface mounted on 1in^2 pad area.

Note c : UIS tested and pulse width limited by maximum junction temperature 150°C (initial temperature $T_J = 25^\circ\text{C}$)

N Channel Electrical Characteristics (T_A = 25°C unless otherwise noted)

Symbol	Parameter	Test Conditions	N Channel			Unit
			Min.	Typ.	Max.	
Static Characteristics						
BV _{DSS}	Drain-Source Breakdown Voltage	V _{GS} =0V, I _{DS} =250μA	30	-	-	V
I _{DSS}	Zero Gate Voltage Drain Current	V _{DS} =24V, V _{GS} =0V	-	-	50	μA
		T _J =85°C	-	-	5	mA
V _{GS(th)}	Gate Threshold Voltage	V _{DS} =V _{GS} , I _{DS} =250μA	1.3	1.8	2.3	V
I _{GSS}	Gate Leakage Current	V _{GS} =±20V, V _{DS} =0V	-	-	±100	nA
R _{DS(ON)} ^d	Drain-Source On-state Resistance	V _{GS} =10V, I _{DS} =9A	-	7	10	mΩ
		V _{GS} =4.5V, I _{DS} =8A	-	9	12	mΩ
Diode Characteristics						
V _{SD} ^d	Diode Forward Voltage	I _{SD} =1A, V _{GS} =0V	0.3	0.4	0.55	V
t _{rr}	Reverse Recovery Time	I _{SD} =4.0A, dI _{SD} /dt=100A/μs	-	11	-	ns
Q _{rr}	Reverse Recovery Charge		-	3.5	-	nC
Dynamic Characteristics ^e						
R _G	Gate Resistance	V _{GS} =0V, V _{DS} =0V, f=1MHz	-	3.3	-	Ω
C _{iss}	Input Capacitance	V _{GS} =0V, V _{DS} =15V, Frequency=1.0MHz	-	395	514	pF
C _{oss}	Output Capacitance		-	105	-	
C _{rss}	Reverse Transfer Capacitance		-	42	-	
t _{d(ON)}	Turn-on Delay Time	V _{DD} =15V, R _L =15Ω, I _{DS} =1A, V _{GEN} =10V, R _G =6Ω	-	5.5	-	ns
t _r	Turn-on Rise Time		-	10.5	-	
t _{d(OFF)}	Turn-off Delay Time		-	15	-	
t _f	Turn-off Fall Time		-	3.7	-	
Gate Charge Characteristics ^e						
Q _g	Total Gate Charge	V _{DS} =15V, V _{GS} =4.5V, I _{DS} =4.0A	-	4	-	nC
Q _g	Total Gate Charge	V _{DS} =15V, V _{GS} =10V, I _{DS} =4.0A	-	8.3	12.5	
Q _{gs}	Gate-Source Charge		-	1.1	-	
Q _{gd}	Gate-Drain Charge		-	1.8	-	

Note d : Pulse test ; pulse width≤300μs, duty cycle≤2%.

Note e : Guaranteed by design, not subject to production testing.

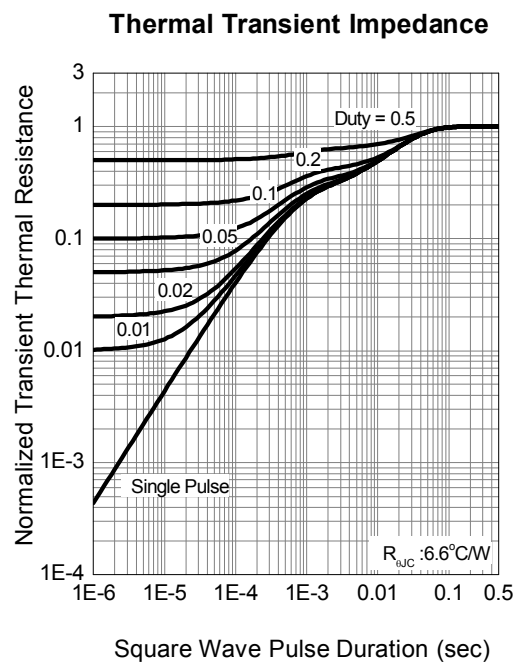
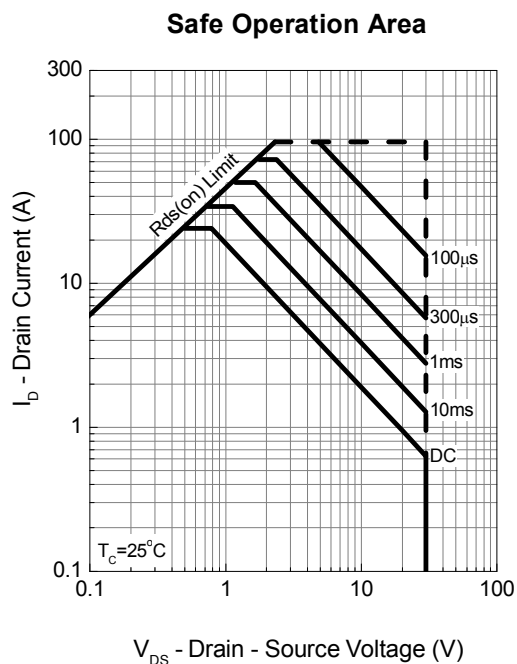
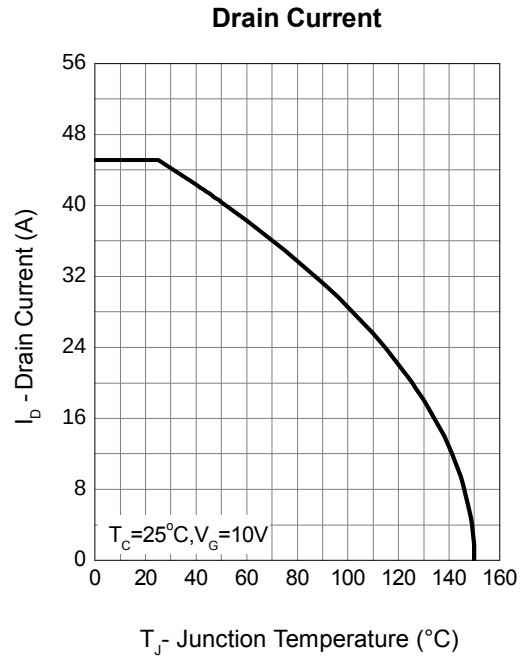
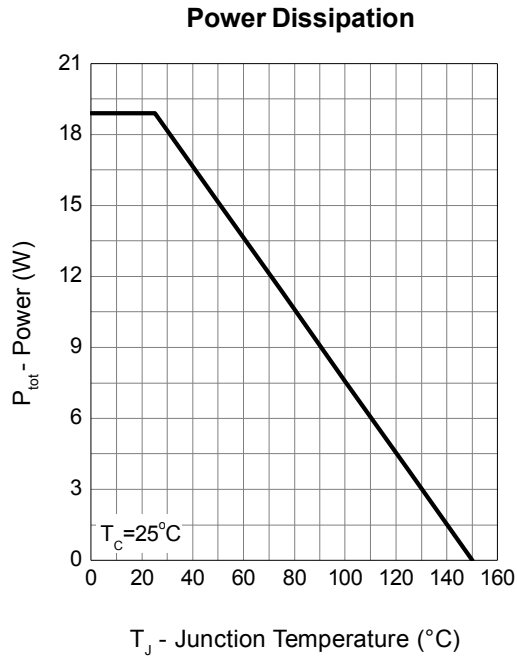
P Channel Electrical Characteristics (T_A = 25°C unless otherwise noted)

Symbol	Parameter	Test Conditions	P Channel			Unit
			Min.	Typ.	Max.	
Static Characteristics						
BV _{DSS}	Drain-Source Breakdown Voltage	V _{GS} =0V, I _{DS} =-250μA	-30	-	-	V
I _{DSS}	Zero Gate Voltage Drain Current	V _{DS} =-24V, V _{GS} =0V	-	-	-1	μA
		T _J =85°C	-	-	-30	
V _{GS(th)}	Gate Threshold Voltage	V _{DS} =V _{GS} , I _{DS} =-250μA	-1.3	-1.8	-2.3	V
I _{GSS}	Gate Leakage Current	V _{GS} =±20V, V _{DS} =0V	-	-	±100	nA
R _{DS(ON)} ^d	Drain-Source On-state Resistance	V _{GS} =-10V, I _{DS} =-7A	-	10	13	mΩ
		V _{GS} =-4.5V, I _{DS} =-4A	-	13	16	mΩ
Diode Characteristics						
V _{SD} ^d	Diode Forward Voltage	I _{SD} =-1A, V _{GS} =0V	-	-0.75	-1	V
t _{rr}	Reverse Recovery Time	I _{SD} =-7.0A,	-	17	-	ns
Q _{rr}	Reverse Recovery Charge	di _{SD} /dt=100A/μs	-	9	-	nC
Dynamic Characteristics ^e						
R _G	Gate Resistance	V _{GS} =0V, V _{DS} =0V, f=1MHz	-	12	-	Ω
C _{iss}	Input Capacitance	V _{GS} =0V, V _{DS} =-15V, Frequency=1.0MHz	-	750	975	pF
C _{oss}	Output Capacitance		-	142	-	
C _{rss}	Reverse Transfer Capacitance		-	102	-	
t _{d(ON)}	Turn-on Delay Time	V _{DD} =-15V, R _L =15Ω, I _{DS} =-1A, V _{GEN} =-10V, R _G =6Ω	-	9	17	ns
t _r	Turn-on Rise Time		-	11	20	
t _{d(OFF)}	Turn-off Delay Time		-	55	99	
t _f	Turn-off Fall Time		-	34	62	
Gate Charge Characteristics ^e						
Q _g	Total Gate Charge	V _{DS} =-15V, V _{GS} =-4.5V, I _{DS} =-7.0A	-	8	-	nC
Q _g	Total Gate Charge	V _{DS} =-15V, V _{GS} =-10V, I _{DS} =-7.0A	-	17	24	
Q _{gth}	Threshold Gate Charge		-	1	-	
Q _{gs}	Gate-Source Charge		-	2	-	
Q _{gd}	Gate-Drain Charge		-	4	-	

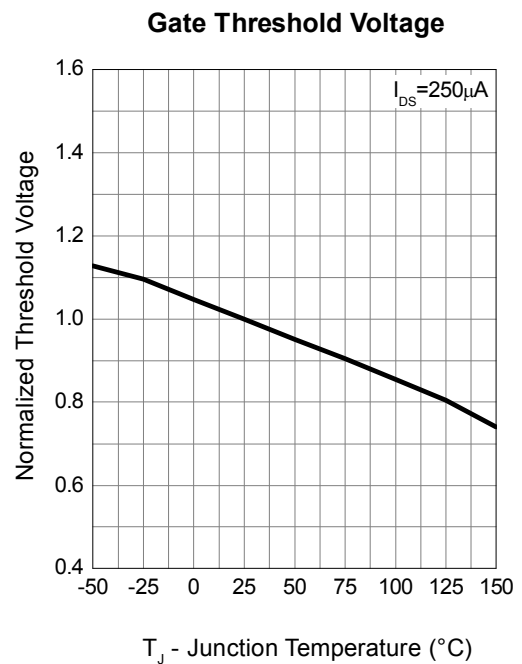
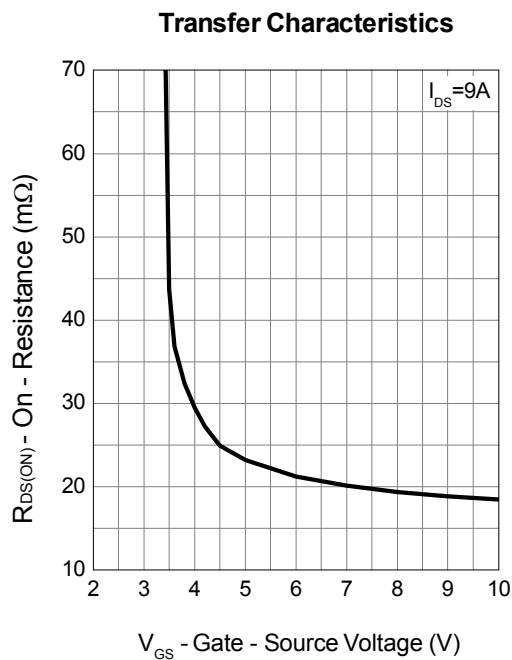
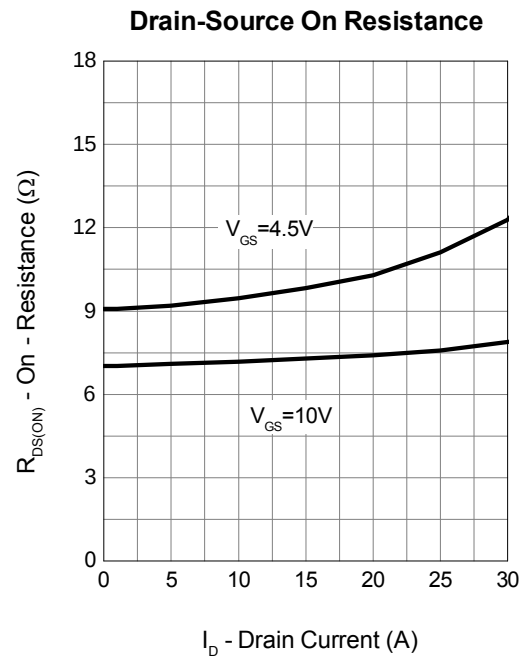
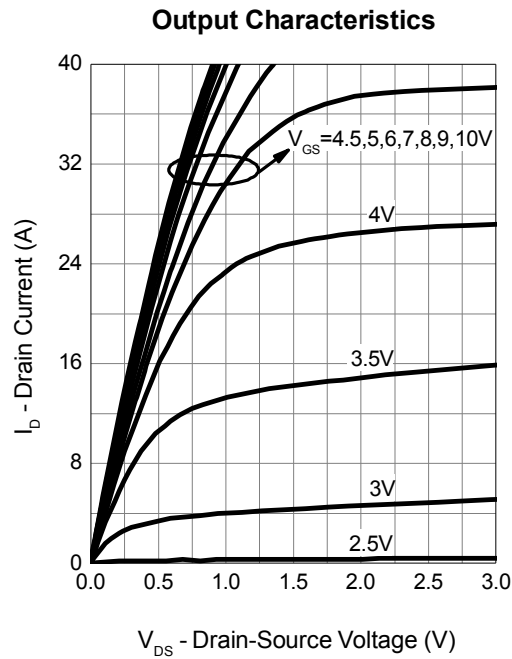
Note d : Pulse test ; pulse width≤300μs, duty cycle≤2%.

Note e : Guaranteed by design, not subject to production testing.

N Channel Typical Operating Characteristics

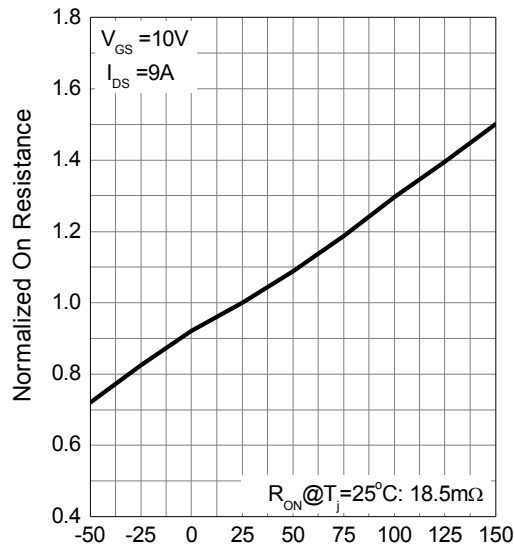


N Channel Typical Operating Characteristics (Cont.)



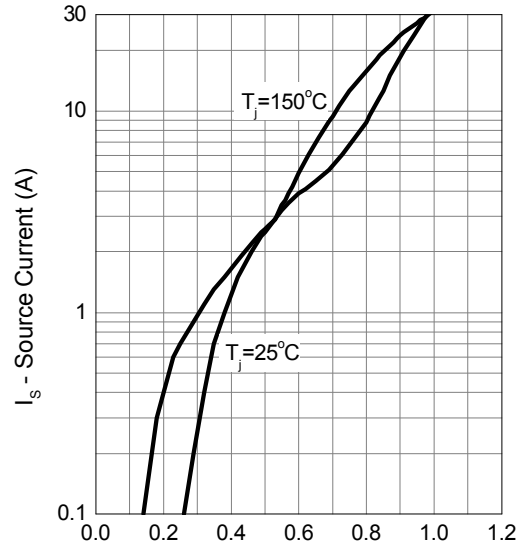
N Channel Typical Operating Characteristics (Cont.)

Drain-Source On Resistance



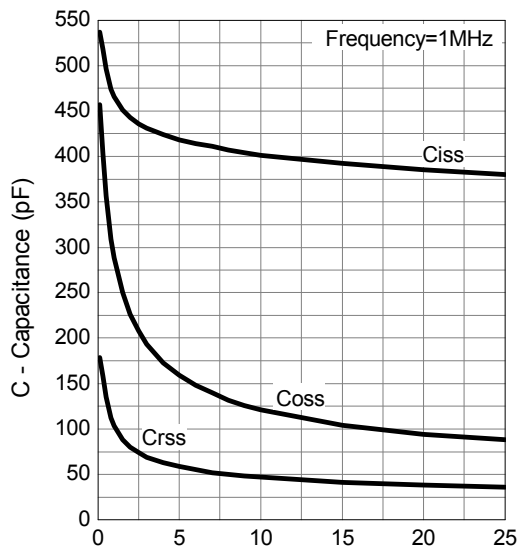
T_J - Junction Temperature ($^{\circ}\text{C}$)

Source-Drain Diode Forward



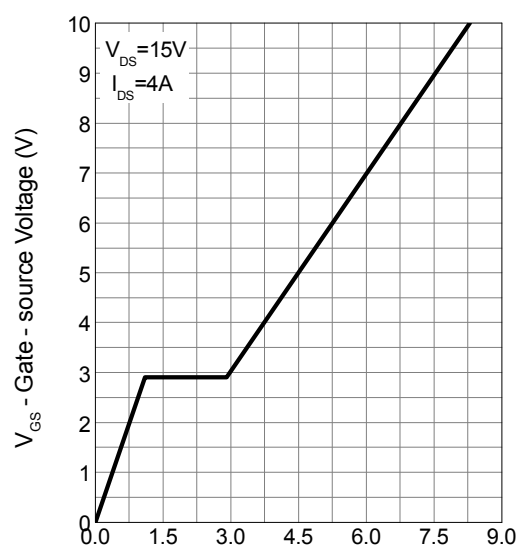
V_{SD} - Source - Drain Voltage (V)

Capacitance



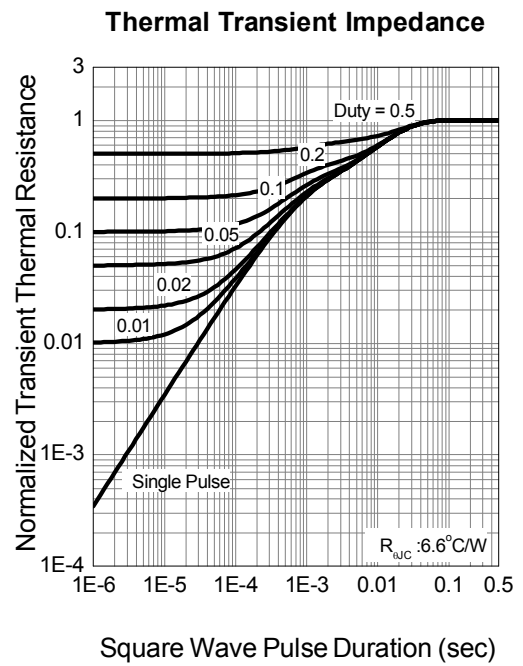
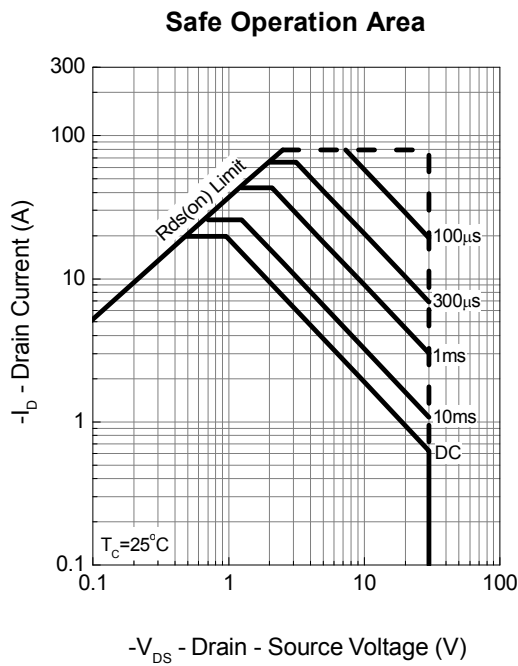
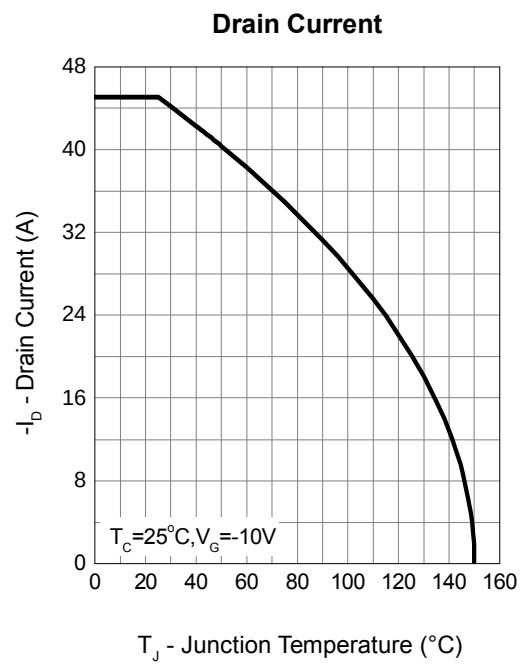
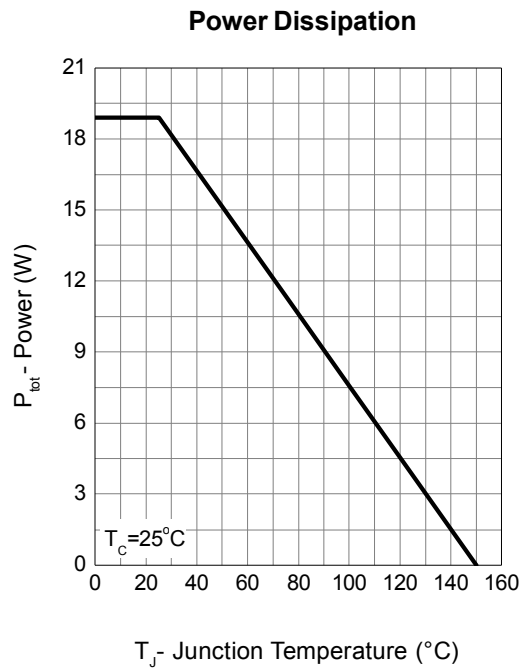
V_{DS} - Drain - Source Voltage (V)

Gate Charge

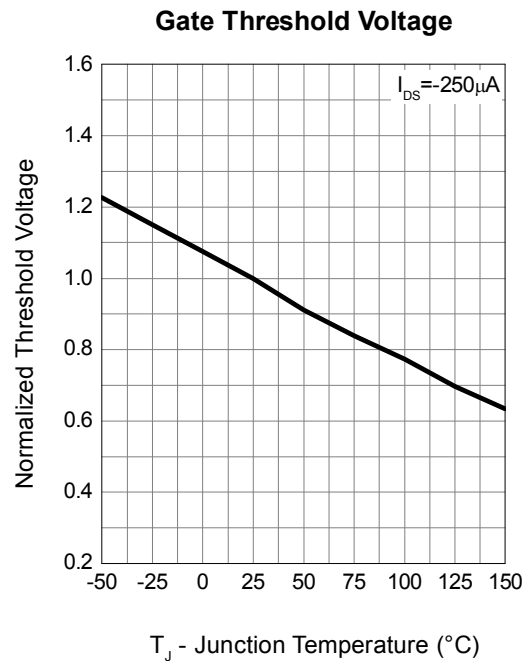
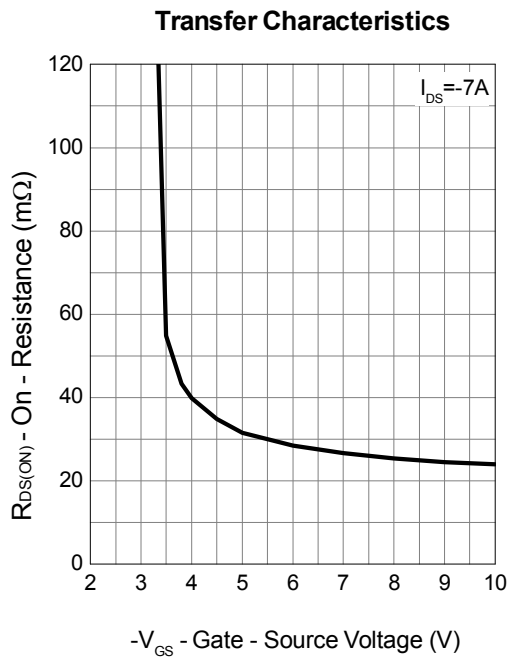
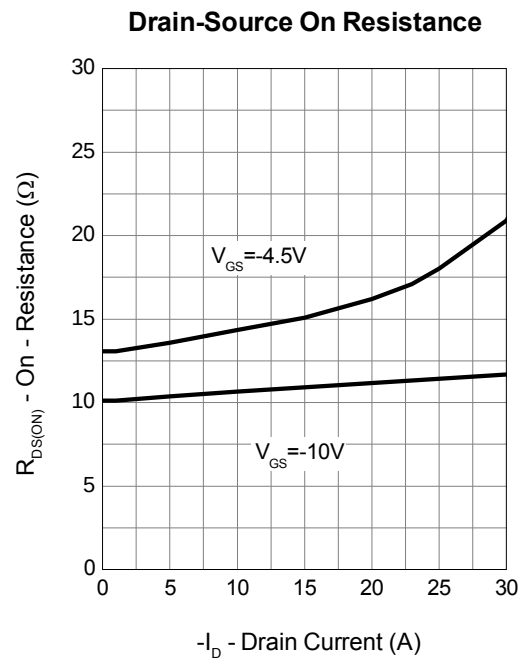
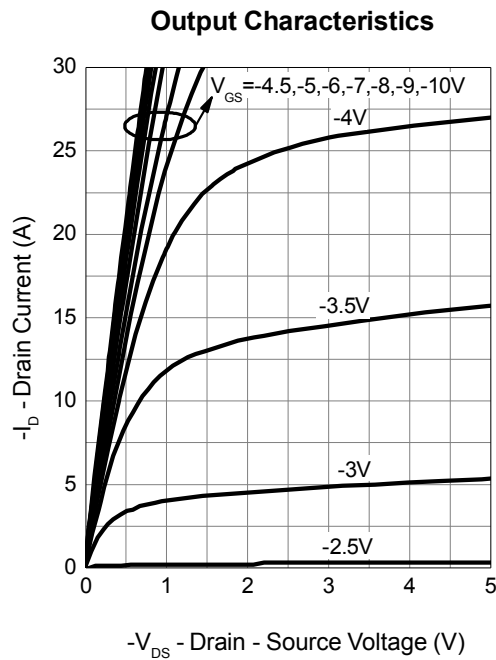


Q_G - Gate Charge (nC)

P Channel Typical Operating Characteristics

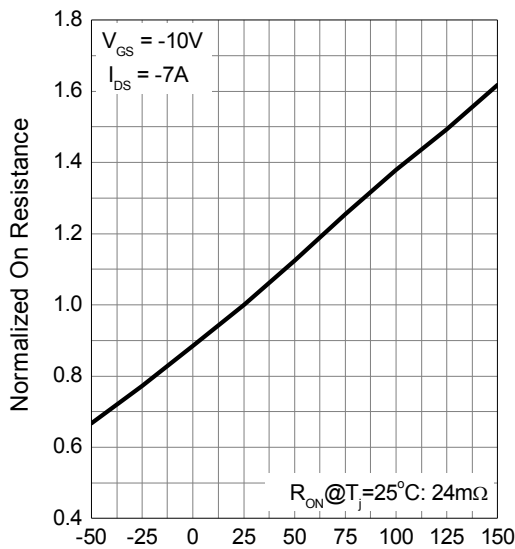


P Channel Typical Operating Characteristics (Cont.)



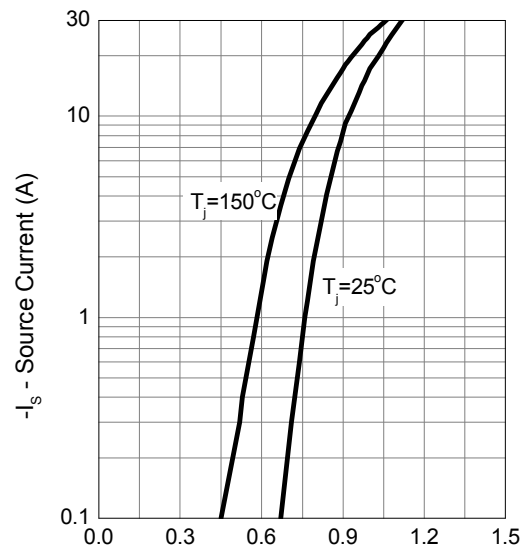
P Channel Typical Operating Characteristics (Cont.)

Drain-Source On Resistance



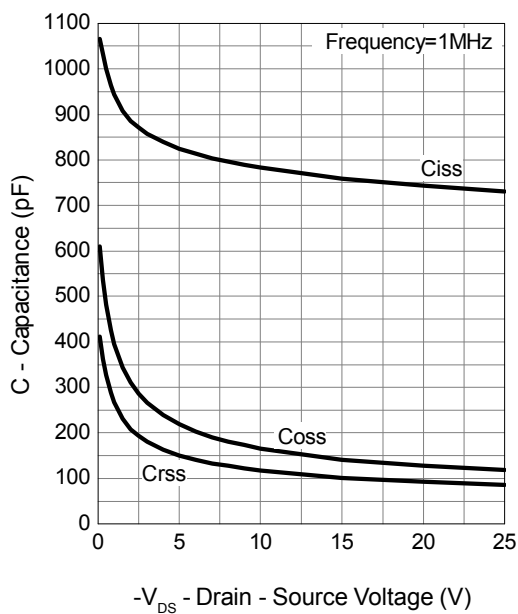
T_j - Junction Temperature ($^{\circ}\text{C}$)

Source-Drain Diode Forward



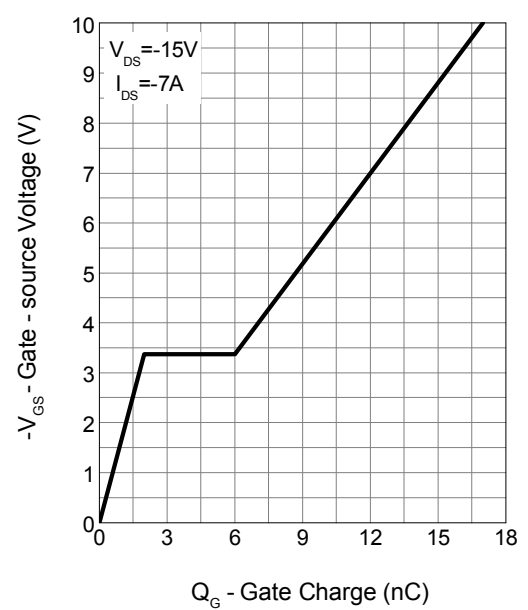
$-V_{SD}$ - Source - Drain Voltage (V)

Capacitance



$-V_{DS}$ - Drain - Source Voltage (V)

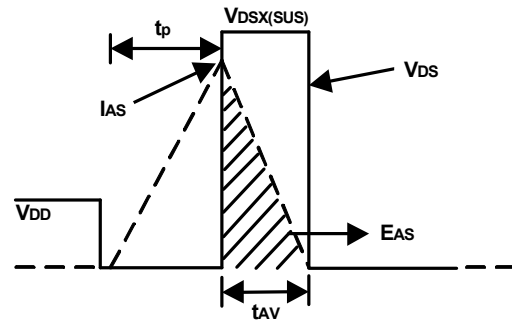
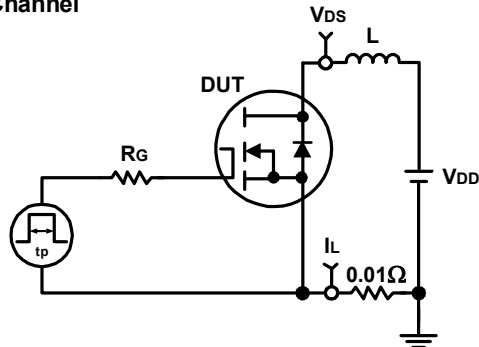
Gate Charge



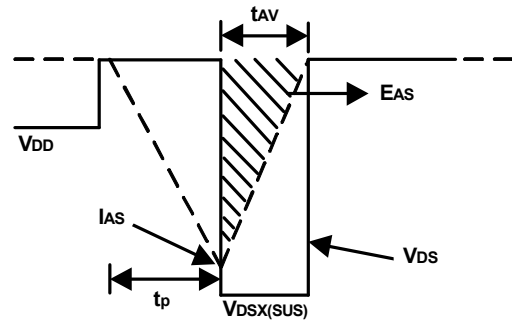
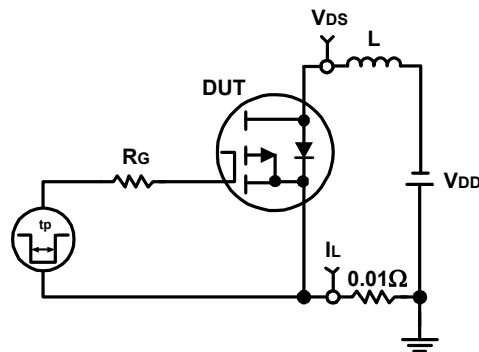
Q_g - Gate Charge (nC)

Avalanche Test Circuit and Waveforms

N Channel

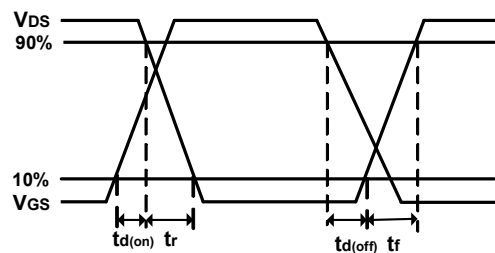
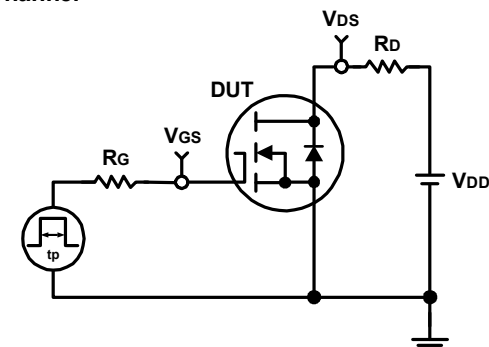


P Channel

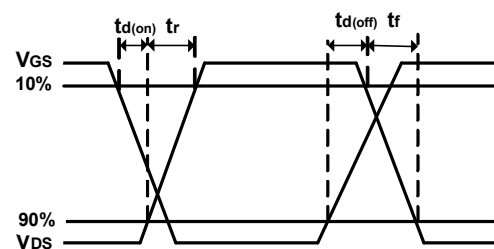
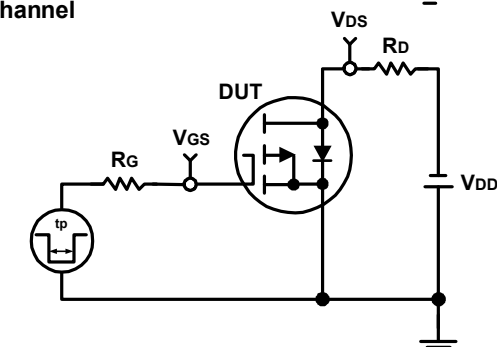


Switching Time Test Circuit and Waveforms

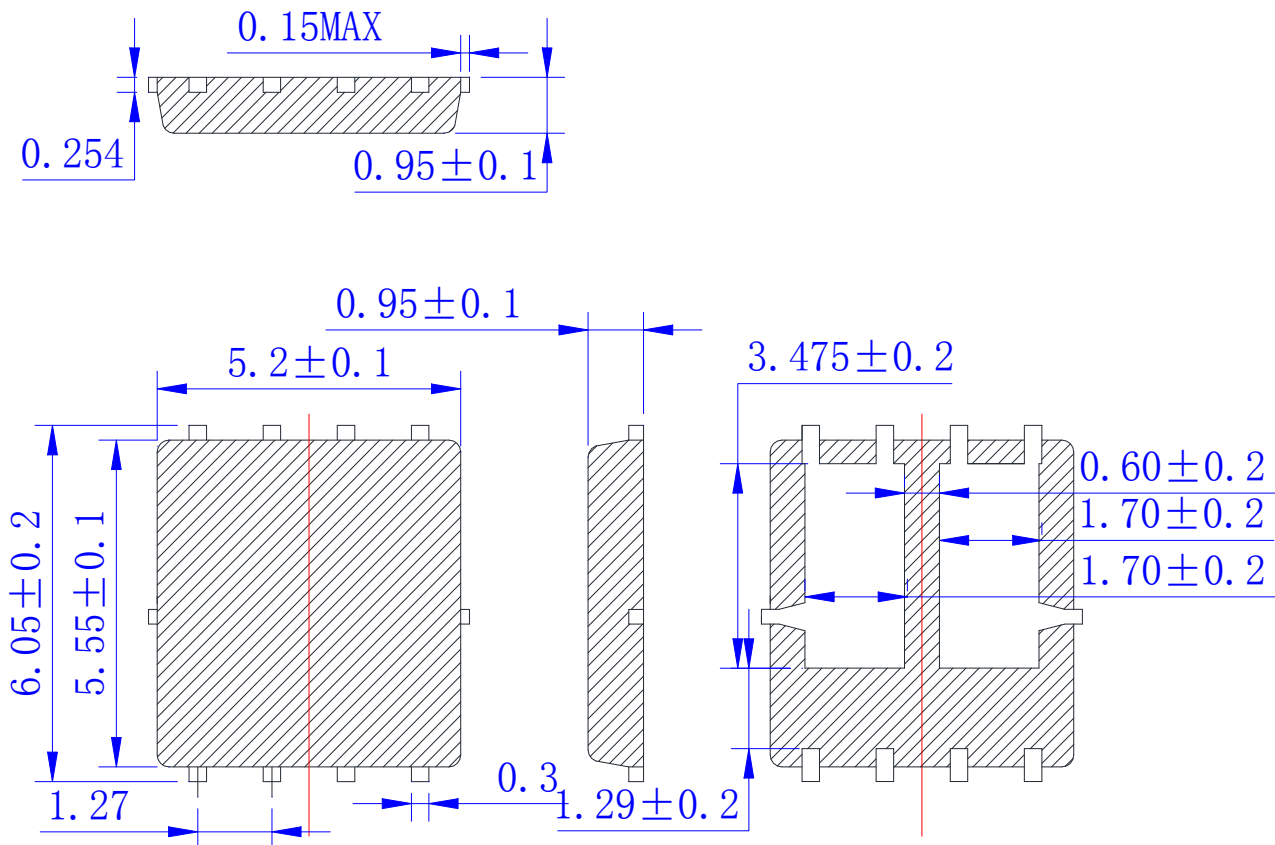
N Channel

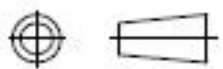


P Channel



PDFN5*6-8L OUTLINE



NAME	DFN5X6 OUTLINE	UNIT	mm	DESIGNED		THIRD ANGLE SYSTEM 
DWGNO		PAGE	1 OF 1	CHECKED		
VERSION	Ver. B	ISSUE DATE		APPROVED		