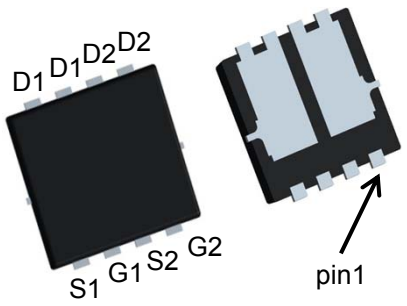
Features

• N-Channel
30V/30A,
$R_{DS\ (ON)}$ =7.5mΩ(Typ.) @ V_{GS}=10V
$R_{DS\ (ON)}$ =10mΩ(Typ.) @ V_{GS}=4.5V
• P-Channel
-30V/-30A,
$R_{DS\ (ON)}$ =13mΩ (Typ.) @ V_{GS}=-10V
$R_{DS\ (ON)}$ =22mΩ (Typ.) @ V_{GS}=-4.5V
• Fast Switching Speed
• ESD Protected
• Low gate Charge
• Lead Free and Green Devices Available (RoHS Compliant)

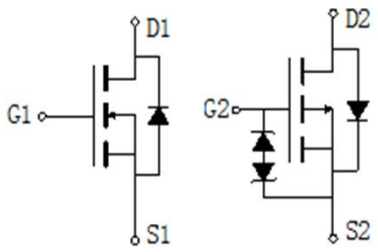
Applications

• Load Switch

Pin Description



PDFN5060



Complementary MOSFET

Absolute Maximum Ratings

Symbol	Parameter		N-Channel	P-Channel	Unit
Common Ratings (T_A=25°C Unless Otherwise Noted)					
V_{DSS}	Drain-Source Voltage		30	-30	V
V_{GSS}	Gate-Source Voltage		±20	±20	
T_J	Maximum Junction Temperature		150	150	°C
T_{STG}	Storage Temperature Range		-55 to 150	-55 to 150	°C
I_S	Diode Continuous Forward Current	T_A=25°C	20	-20	A
Mounted on Large Heat Sink					
I_{DP} ①	300μs Pulse Drain Current Tested	T_A=25°C	120	-120	A
I_D ②	Continuous Drain Current(V_{GS}=±10V)	T_A=25°C	30	-30	A
		T_A=100°C	19	-19	
P_D	Maximum Power Dissipation	T_A=25°C	42	36	W
		T_A=100°C	17	14	
$R_{\theta JC}$	Thermal Resistance-Junction to Case		3	3.5	°C/W
$R_{\theta JA}$ ③	Thermal Resistance-Junction to Ambient		50	50	°C/W
Drain-Source Avalanche Ratings					
E_{AS} ④	Avalanche Energy, Single Pulsed		42	42	mJ

Electrical Characteristics (T_A=25°C Unless Otherwise Noted)

Symbol	Parameter	Test Condition		RU30C30M Min.	RU30C30M Typ.	RU30C30M Max.	Unit
Static Characteristics							
BV_{DSS}	Drain-Source Breakdown Voltage	V_{GS}=0V, I_{DS}=250μA	N	30			V
		V_{GS}=0V, I_{DS}=-250μA	P	-30			
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS}=30V, V_{GS}=0V	N			1	μA
		T_J=125°C	N			30	
		V_{DS}=-30V, V_{GS}=0V	P			-1	
		T_J=125°C	P			-30	
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS}=V_{GS}, I_{DS}=250μA	N	1		2.5	V
		V_{DS}=V_{GS}, I_{DS}=-250μA	P	-1		-2.5	
I_{GSS}	Gate Leakage Current	V_{GS}=±20V, V_{DS}=0V	N			±1	μA
		V_{GS}=±20V, V_{DS}=0V	P			±10	
$R_{DS(ON)}$ ⑤	Drain-Source On-state Resistance	V_{GS}=10V, I_{DS}=20A	N		7.5	10	mΩ
		V_{GS}=-10V, I_{DS}=-20A	P		13	18	
		V_{GS}=4.5V, I_{DS}=16A	N		10	15	
		V_{GS}=-4.5V, I_{DS}=-16A	P		22	28	
Diode Characteristics							
V_{SD} ⑤	Diode Forward Voltage	I_{SD}=20A, V_{GS}=0V	N			1.2	V
		I_{SD}=-20A, V_{GS}=0V	P			-1.3	
t_{rr}	Reverse Recovery Time	N-Channel I_{SD}=20A, dI_{SD}/dt=100A/μs	N		24		ns
			P		45		
Q_{rr}	Reverse Recovery Charge	P-Channel I_{SD}=-20A, dI_{SD}/dt=100A/μs	N		16		nC
			P		26		
Dynamic Characteristics ⑥							
R_G	Gate Resistance	V_{GS}=0V,V_{DS}=0V,F=1MHz	N		1.2		Ω
			P		1.8		
C_{iss}	Input Capacitance	N-Channel V_{GS}=0V,V_{DS}=15V, Frequency=1.0MHz	N		780		pF
			P		1560		
C_{oss}	Output Capacitance	P-Channel V_{GS}=0V,V_{DS}=-15V, Frequency=1.0MHz	N		190		
			P		245		
C_{rss}	Reverse Transfer Capacitance		N		70		
			P		135		

Electrical Characteristics (T_A=25°C Unless Otherwise Noted)

Symbol	Parameter	Test Condition		XPX3033RD			Unit
				Min.	Typ.	Max.	
Dynamic Characteristics⑥							
$t_{d(ON)}$	Turn-on Delay Time	N-Channel V_{DD}=15V, I_{DS}=20A, V_{GEN}=10V, R_G=4.7Ω	N		6		ns
			P		27		
t_r	Turn-on Rise Time		N		8		
			P		32		
$t_{d(OFF)}$	Turn-off Delay Time	P-Channel V_{DD}=-15V, I_{DS}=-20A, V_{GEN}= -10V, R_G=4.7Ω	N		20		
			P		37		
t_f	Turn-off Fall Time		N		4		
			P		14		
Gate Charge Characteristics⑥							
Q_g	Total Gate Charge	N-Channel V_{DS}=24V, V_{GS}=10V, I_{DS}=20A	N		18		nC
			P		42		
Q_{gs}	Gate-Source Charge	P-Channel V_{DS}=-24V, V_{GS}= -10V, I_{DS}=-20A	N		6		
			P		9		
Q_{gd}	Gate-Drain Charge		N		5		
			P		13		

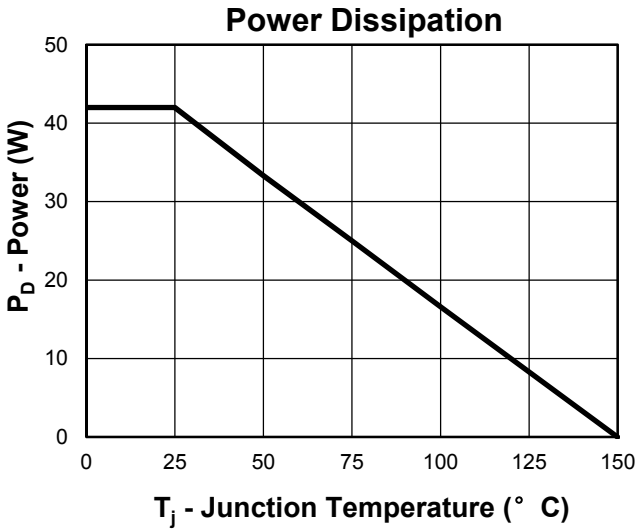
Notes:

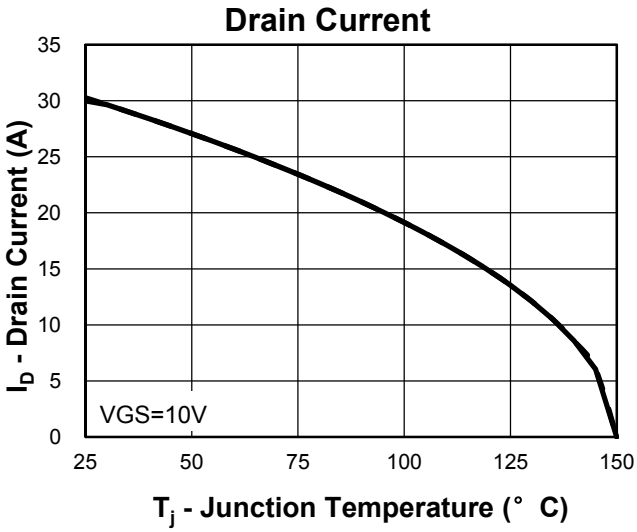
① Pulse width limited by safe operating area.
② Calculated continuous current based on maximum allowable junction temperature.
③ When mounted on 1 inch square copper board, t≤10sec.
④ Limited by TJmax, IAS =13A, VDD =24V, RG = 50Ω , Starting TJ = 25° C.
⑤ Pulse test ; Pulse width300s, duty cycle2%.
⑥ Guaranteed by design, not subject to production testing.

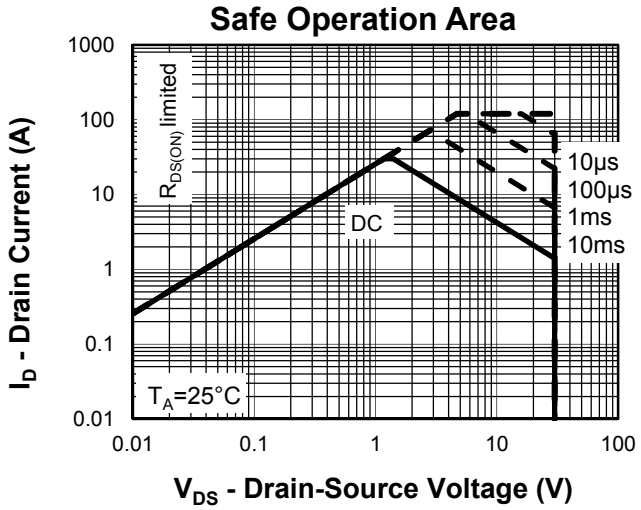
Ordering and Marking Information

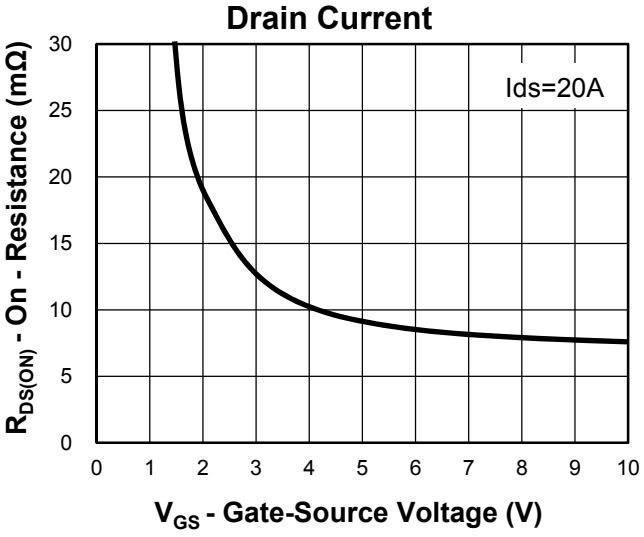
Device	Marking	Package	Packaging	Quantity	Reel Size	Tape width
XPX3033RD	XPX3033RD	PDFN5060	Tape&Reel	5000	13''	12mm

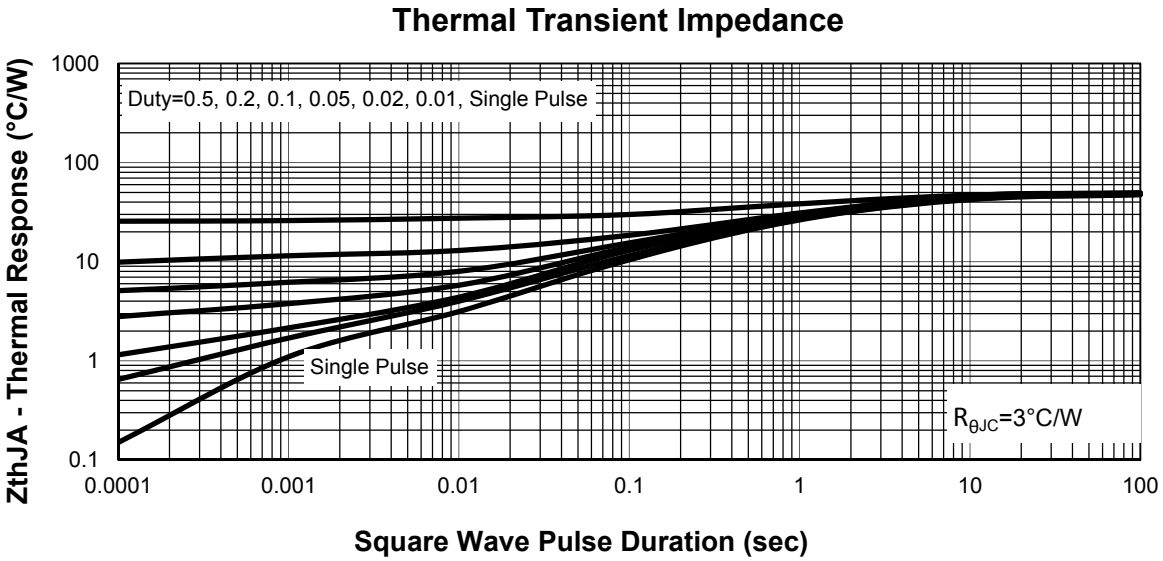
Typical Characteristics(N-Channel)





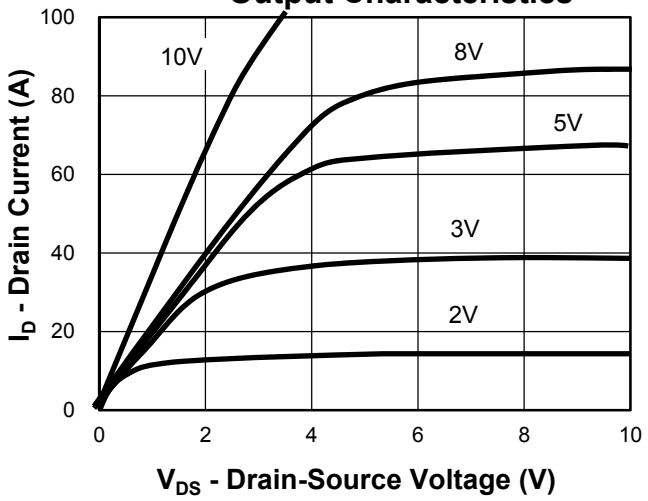




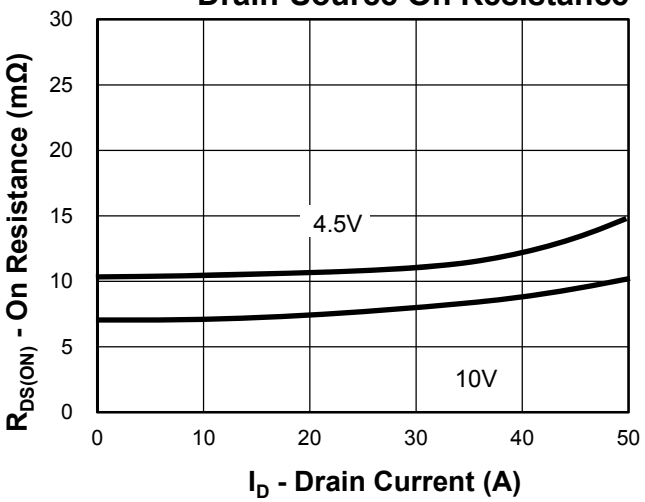


Typical Characteristics(N-Channel)

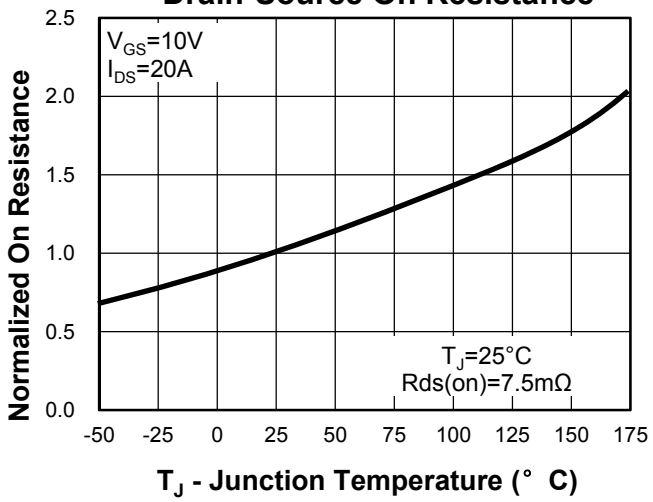
Output Characteristics



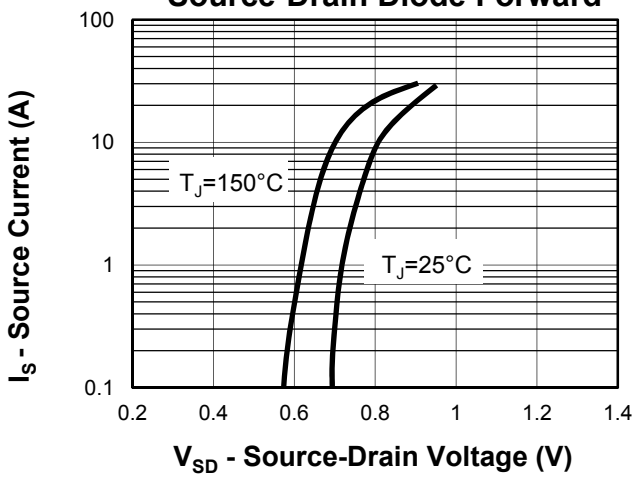
Drain-Source On Resistance



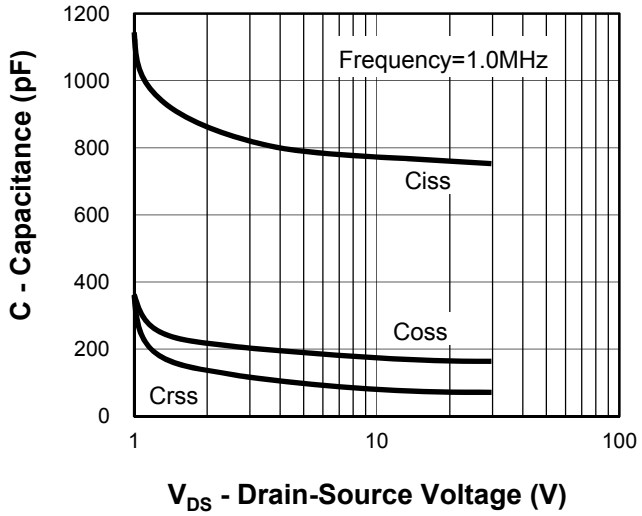
Drain-Source On Resistance



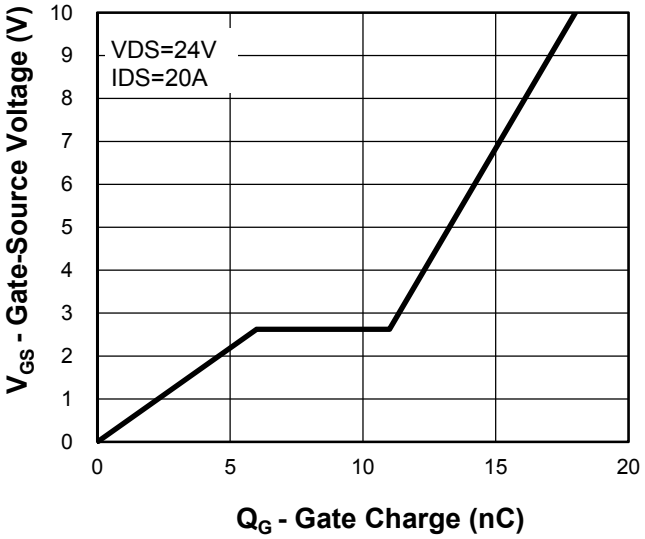
Source-Drain Diode Forward



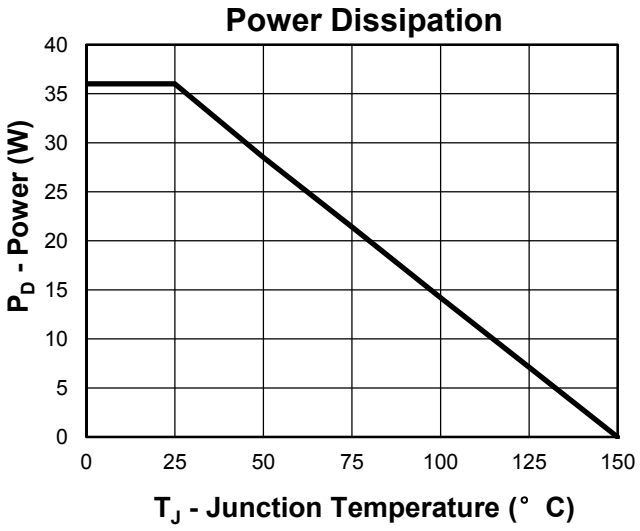
Capacitance

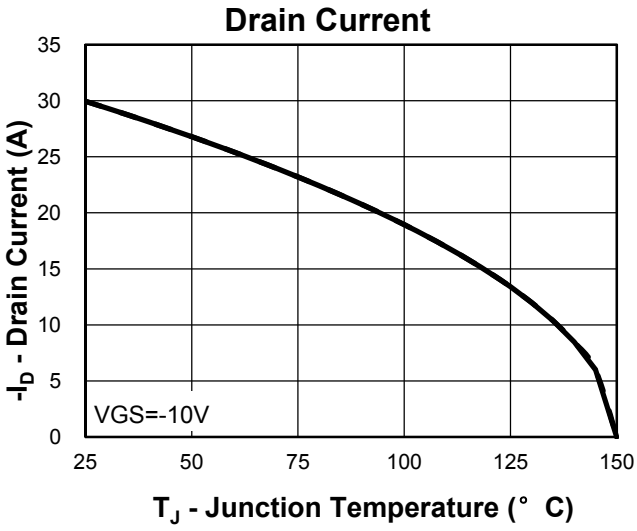


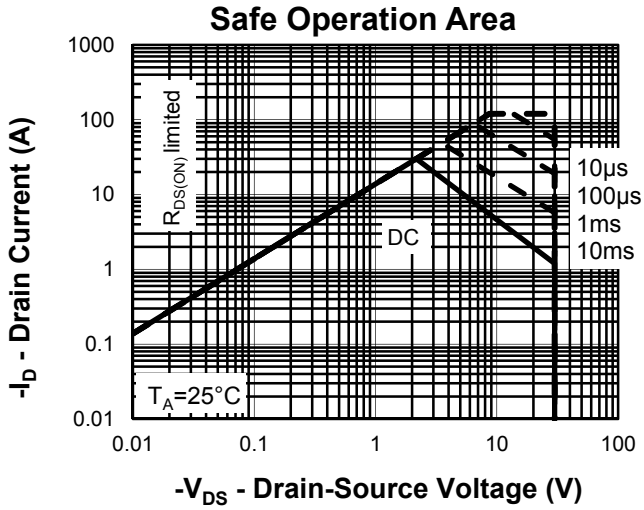
Gate Charge

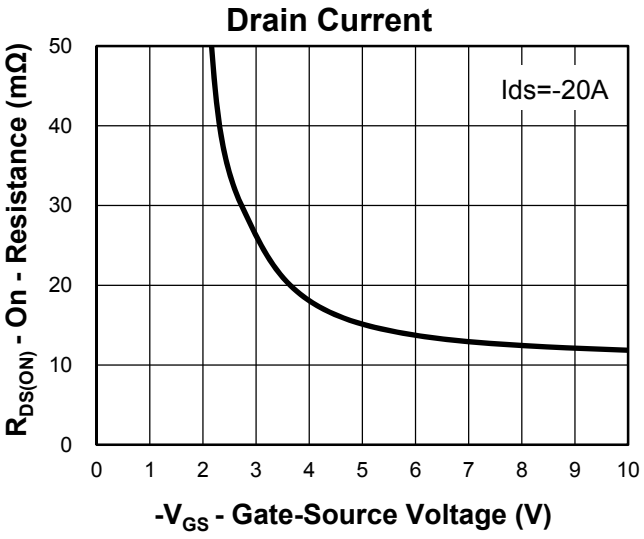


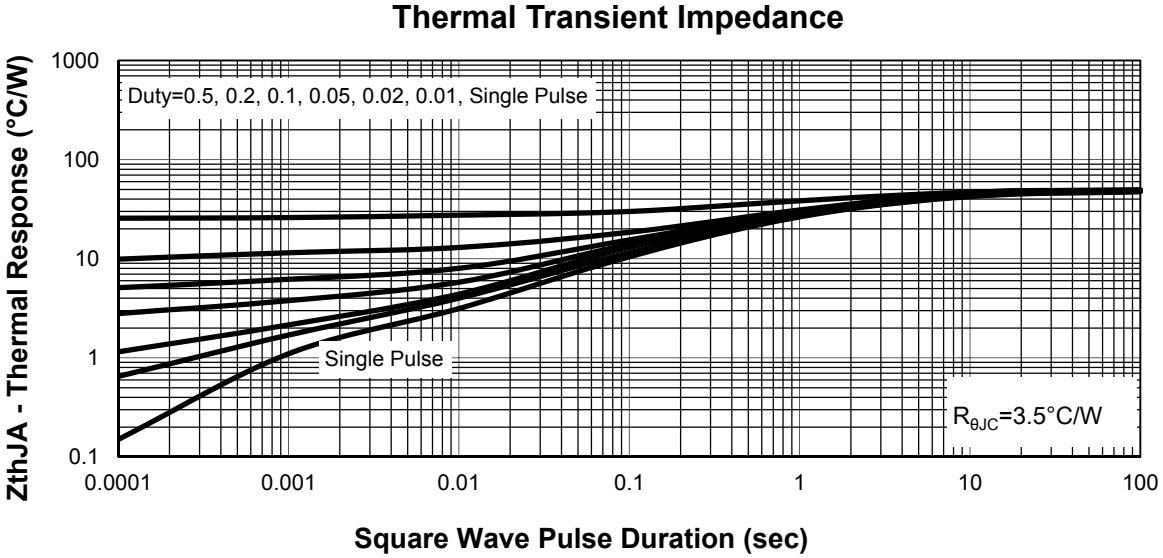
Typical Characteristics(P-Channel)





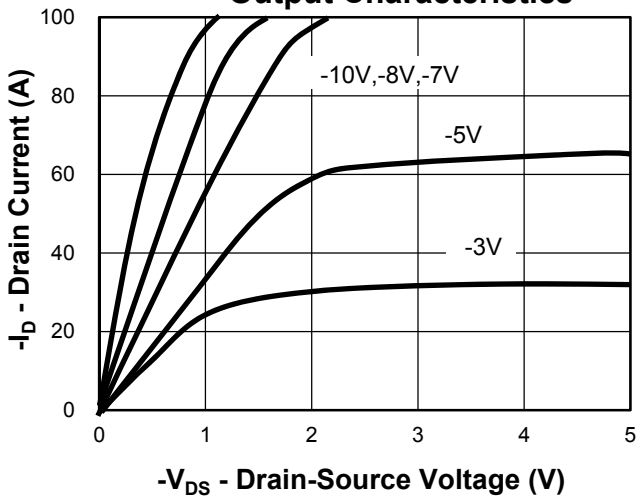




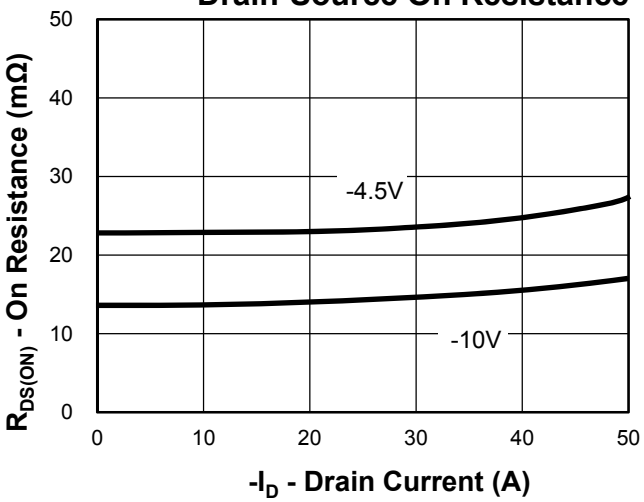


Typical Characteristics(P-Channel)

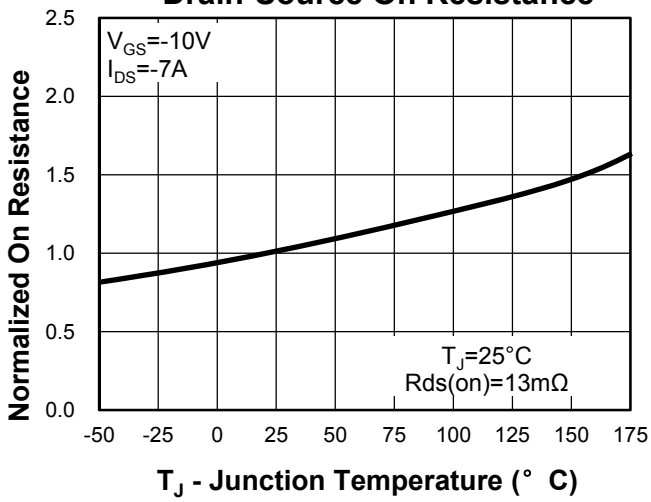
Output Characteristics



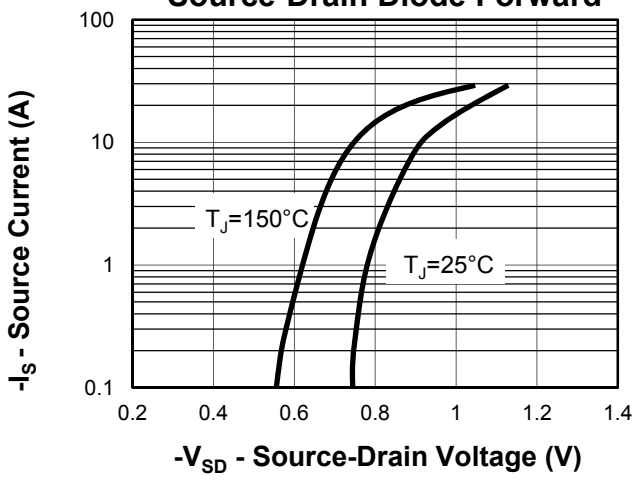
Drain-Source On Resistance



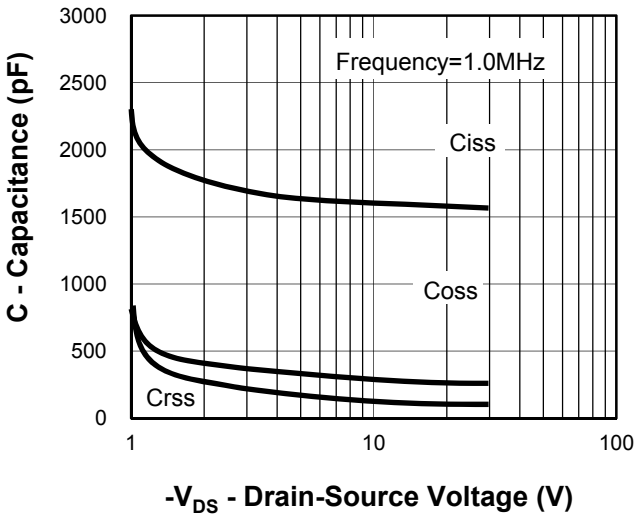
Drain-Source On Resistance



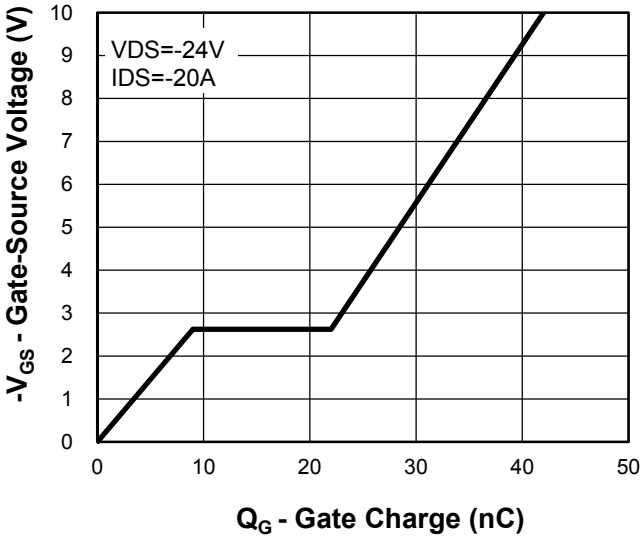
Source-Drain Diode Forward



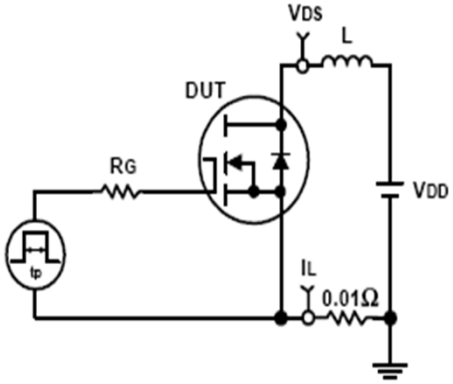
Capacitance

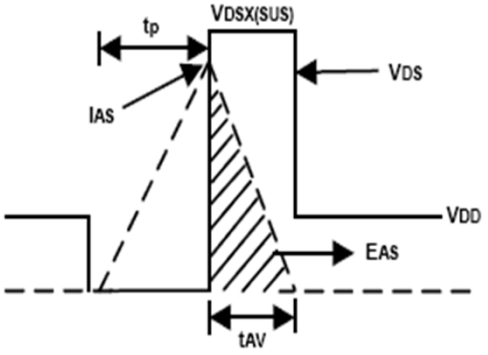


Gate Charge

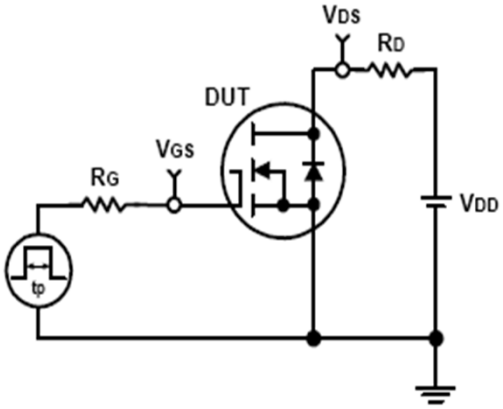


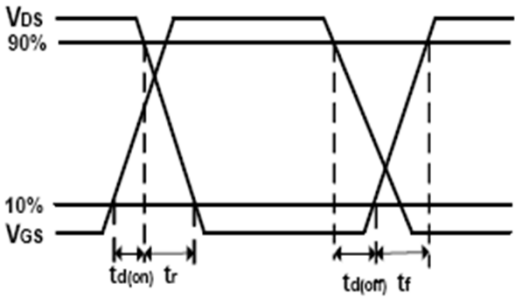
Avalanche Test Circuit and Waveforms





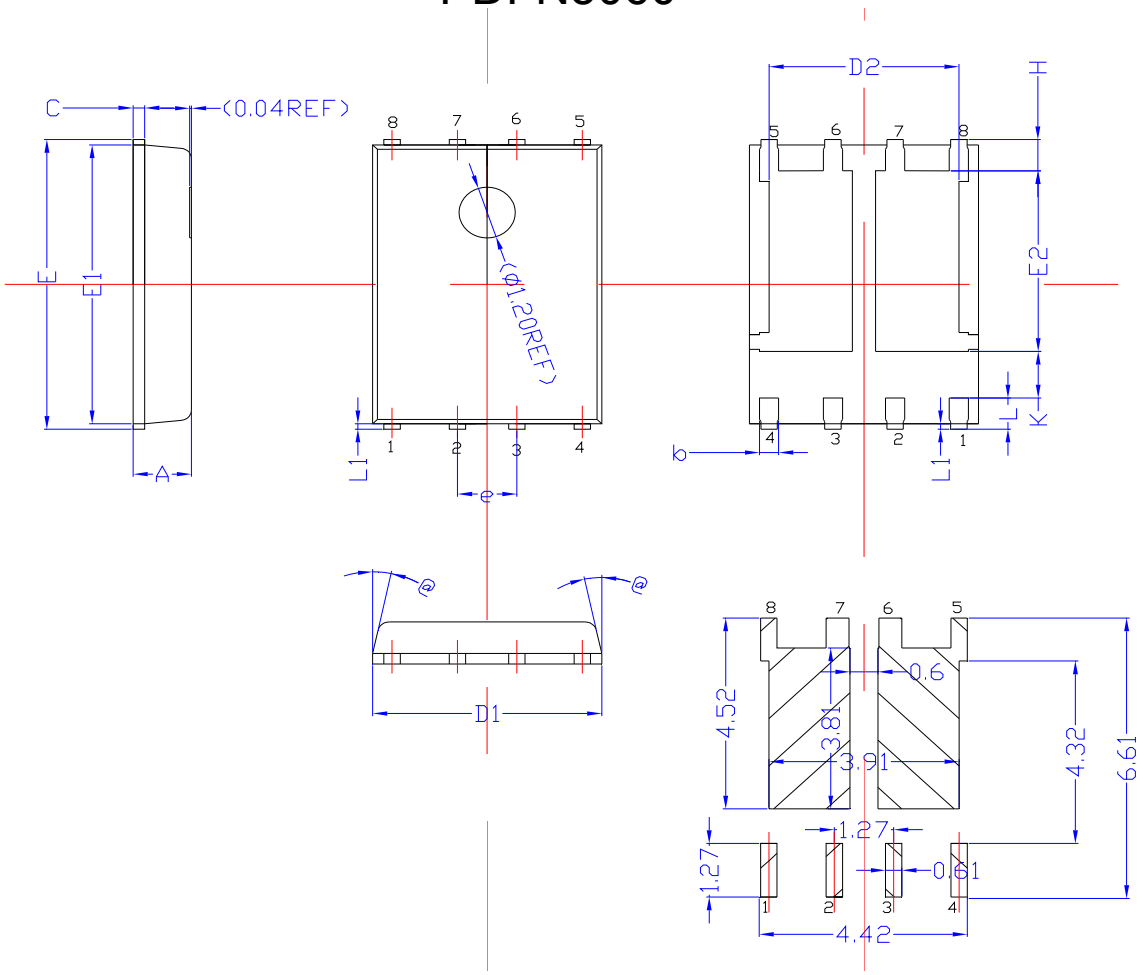
Switching Time Test Circuit and Waveforms





Package Information

PDFN5060



NOTE:

1: ALL UNITS ARE IN MILLIMETER.

2: EJECTOR PIN MARK POSITION MAY VARY FROM DIFFERENT MOLD.

3: ALL DIMENSIONS REFER TO JEDEC.DO NOT INCLUDE MOLD FLASH OR PROTRUSIONS.

SYMBOL	MM			INCH			SYMBOL	MM			INCH		
	MIN	NOM	MAX	MIN	NOM	MAX		MIN	NOM	MAX	MIN	NOM	MAX
A	0.90	1.00	1.10	0.035	0.039	0.043	E1	5.70	5.75	5.80	0.224	0.226	0.228
b	0.33	0.41	0.51	0.013	0.016	0.020	E2	3.38	3.58	3.78	0.133	0.141	0.149
c	0.20	0.25	0.30	0.008	0.010	0.012	e	1.27BSC			0.05BSC		
D1	4.80	4.90	5.00	0.189	0.193	0.197	H	0.41	0.51	0.61	0.016	0.020	0.024
D2	3.61	3.81	3.96	0.142	0.150	0.156	L	0.51	0.61	0.71	0.020	0.024	0.028
L1	0.06	0.13	0.20	0.002	0.005	0.008							
E	5.90	6.00	6.10	0.232	0.236	0.240	@	0°	*	12°	*	10°	12°
K	1.10	*	*	0.043	*	*	M	0.50	*	*	0.020	*	*

Flow (wave) soldering (solder dipping)

Product	Peak Temperature	Dipping Time
Pb device	245℃±5℃	5sec±1sec
Pb-Free device	260℃+0/-5℃	5sec±1sec

This integrated circuit can be damaged by ESD UniverChip Corporation recommends that all integrated circuits be handled with appropriate precautions. Failure to observe proper handling and installation procedure can cause damage. ESD damage can range from subtle performance degradation to complete device failure. Precision integrated circuits may be more susceptible to damage because very small parametric changes could cause the device not to meet its published specifications.

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- This catalog provides information as of Sep.2019. Specifications and information herein are subject to change without notice.