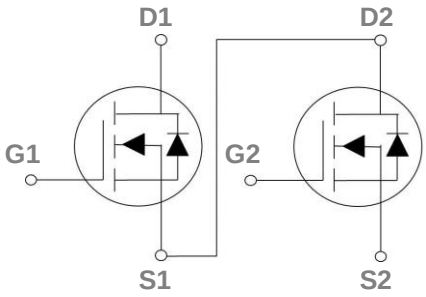
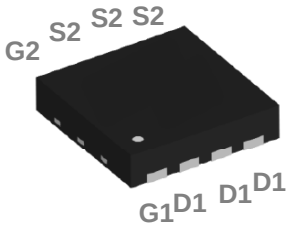
N-Channel Enhancement Mode Power MOSFET

Features

- 30V/30A,
  $R_{DS\ (ON)}$ =7mΩ(Typ.)@V_{GS}=10V
  $R_{DS\ (ON)}$ =9.5mΩ(Typ.)@V_{GS}=4.5V
- Fast Switching Speed
- Low gate Charge
- 100% avalanche tested
- Lead Free and Green Devices Available (RoHS Compliant)





Applications

- Switching Application Systems
- DC/DC Converters

Absolute Maximum Ratings

Symbol	Parameter		Rating	Unit
Common Ratings (T_C=25°C Unless Otherwise Noted)				
V_{DSS}	Drain-Source Voltage		30	V
V_{GSS}	Gate-Source Voltage		±20	
T_J	Maximum Junction Temperature		150	°C
T_{STG}	Storage Temperature Range		-55 to 150	°C
I_S	Diode Continuous Forward Current	T_C=25°C	20	A
Mounted on Large Heat Sink				
I_{DP} ①	300μs Pulse Drain Current Tested	T_C=25°C	120	A
I_D ②	Continuous Drain Current@T_C(V_{GS}=4.5V)	T_C=25°C	30	A
		T_C=100°C	19	
	Continuous Drain Current@T_A(V_{GS}=4.5V) ③	T_A=25°C	10	
		T_A=70°C	8	
P_D	Maximum Power Dissipation@T_C	T_C=25°C	29	W
		T_C=100°C	12	
	Maximum Power Dissipation@T_A ③	T_A=25°C	3.1	
		T_A=70°C	2	

Device	Marking	Package	Packaging	Quantity	Reel Size	Tape width
XPX30N30RD		PDFN5060	Tape&Reel	5000	13"	12mm

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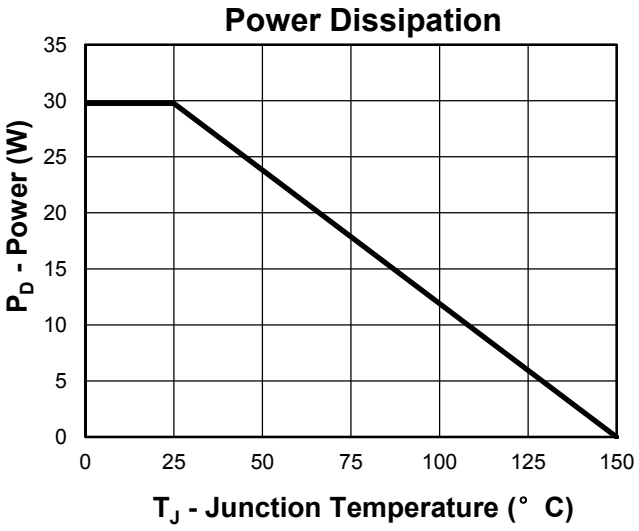
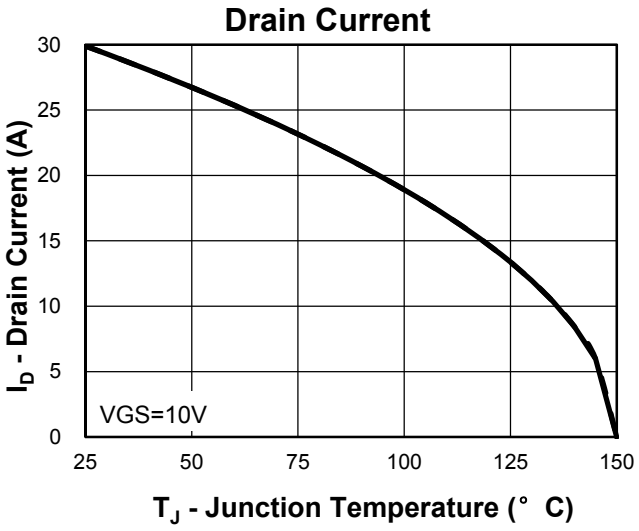
Symbol	Parameter	Rating	Unit
$R_{\theta JC}$	Thermal Resistance-Junction to Case	4.2	°C/W
$R_{\theta JA}$ ③	Thermal Resistance-Junction to Ambient	40	°C/W
Drain-Source Avalanche Ratings			
E_{AS} ④	Avalanche Energy, Single Pulsed	49	mJ

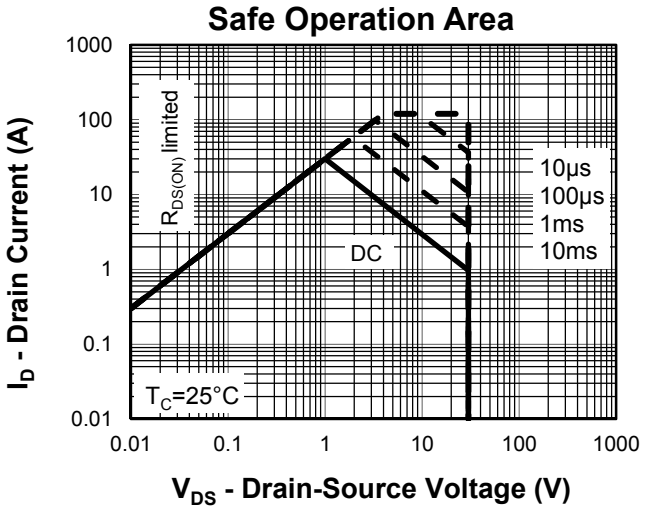
Electrical Characteristics (T_C=25°C Unless Otherwise Noted)

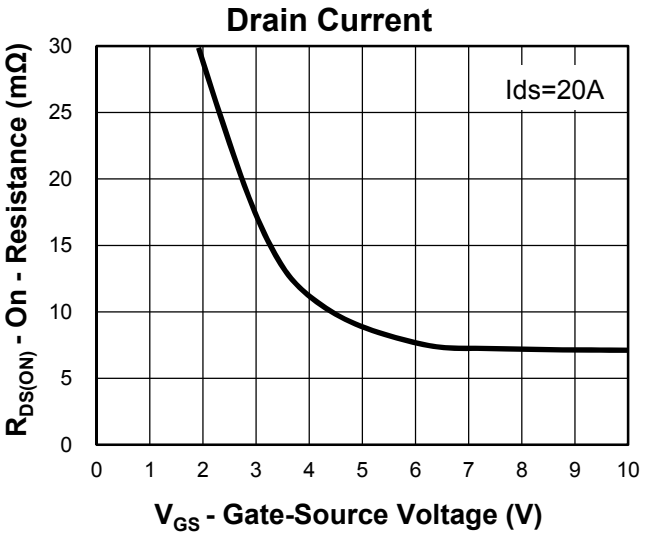
Symbol	Parameter	Test Condition	RU30J30M			Unit
			Min.	Typ.	Max.	
Static Characteristics						
BV_{DSS}	Drain-Source Breakdown Voltage	V_{GS}=0V, I_{DS}=250μA	30			V
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS}=30V, V_{GS}=0V			1	μA
		T_J=125°C			30	
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS}=V_{GS}, I_{DS}=250μA	1.2		2.5	V
I_{GSS}	Gate Leakage Current	V_{GS}=±20V, V_{DS}=0V			±100	nA
$R_{DS(ON)}$ ⑤	Drain-Source On-state Resistance	V_{GS}=10V, I_{DS}=20A		7	9	mΩ
		V_{GS}=4.5V, I_{DS}=16A		9.5	12	mΩ
Diode Characteristics						
V_{SD} ⑤	Diode Forward Voltage	I_{SD}=20A, V_{GS}=0V			1.2	V
t_{rr}	Reverse Recovery Time	I_{SD}=20A, dI_{SD}/dt=100A/μs		15		ns
Q_{rr}	Reverse Recovery Charge			8		nC
Dynamic Characteristics ⑥						
R_G	Gate Resistance	V_{GS}=0V,V_{DS}=0V,F=1MHz		1		Ω
C_{iss}	Input Capacitance	V_{GS}=0V, V_{DS}=15V, Frequency=1.0MHz		670		pF
C_{oss}	Output Capacitance			180		
C_{rss}	Reverse Transfer Capacitance			75		
$t_{d(ON)}$	Turn-on Delay Time	V_{DD}=15V, R_L=0.75Ω, I_{DS}=20A, V_{GEN}=10V, R_G=3Ω		5		ns
t_r	Turn-on Rise Time			10		
$t_{d(OFF)}$	Turn-off Delay Time			15		
t_f	Turn-off Fall Time			4		
Gate Charge Characteristics ⑥						
Q_g	Total Gate Charge	V_{DS}=24V, V_{GS}=10V, I_{DS}=20A		12		nC
Q_{gs}	Gate-Source Charge			3		
Q_{gd}	Gate-Drain Charge			4		

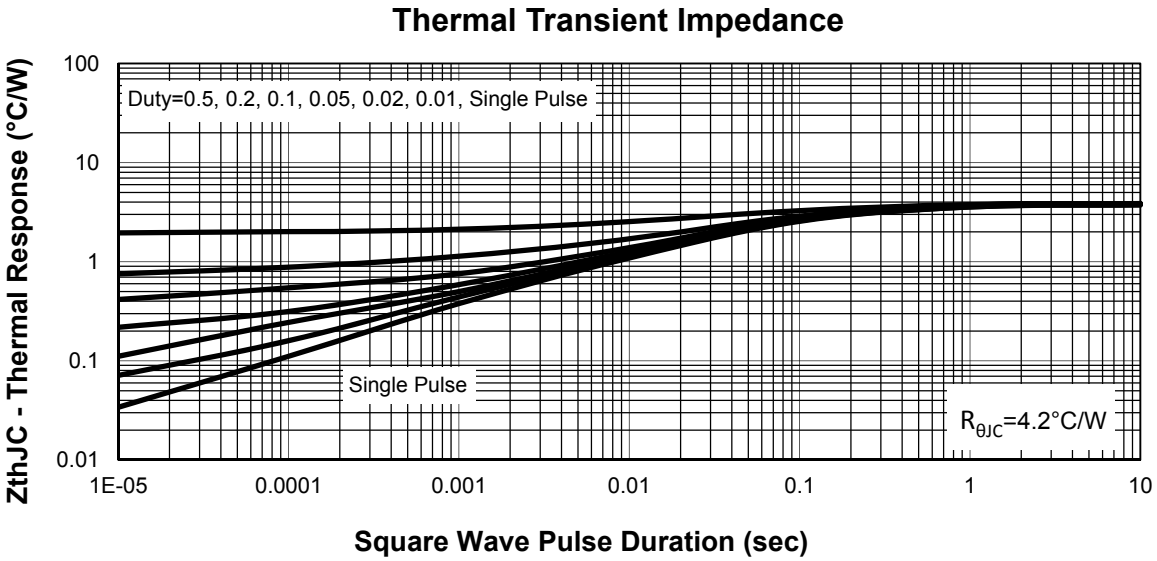
Typical Characteristics





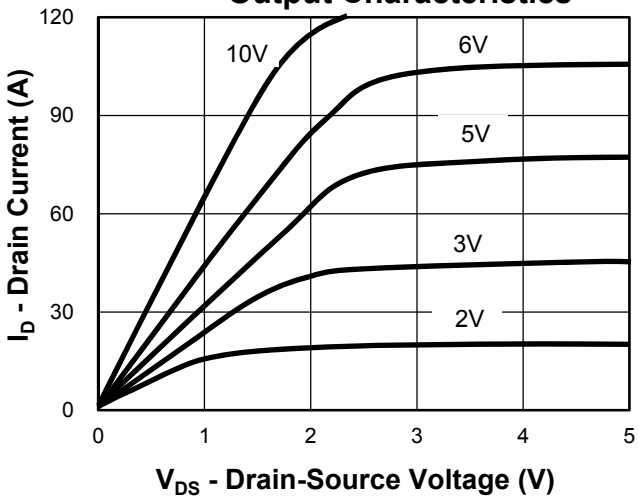




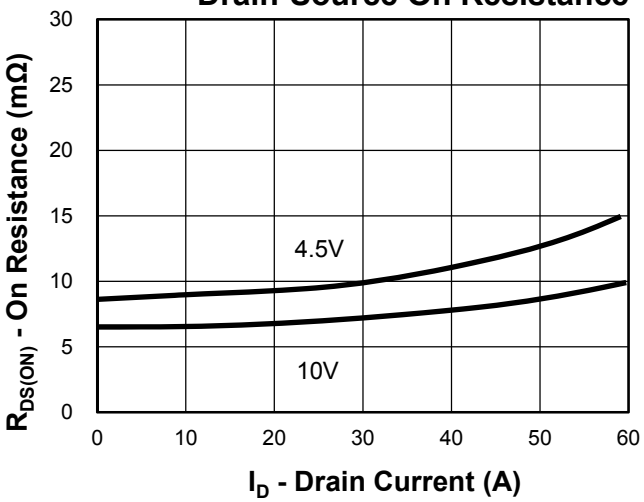


Typical Characteristics

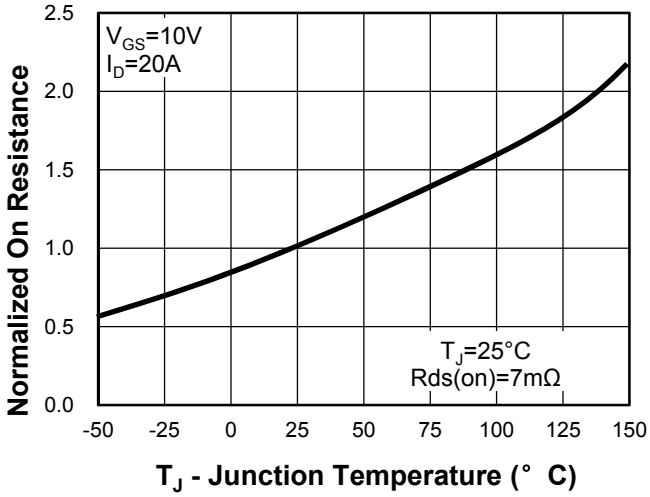
Output Characteristics



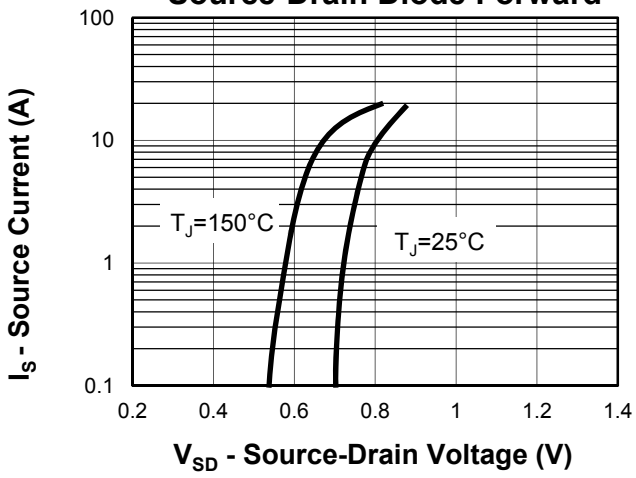
Drain-Source On Resistance



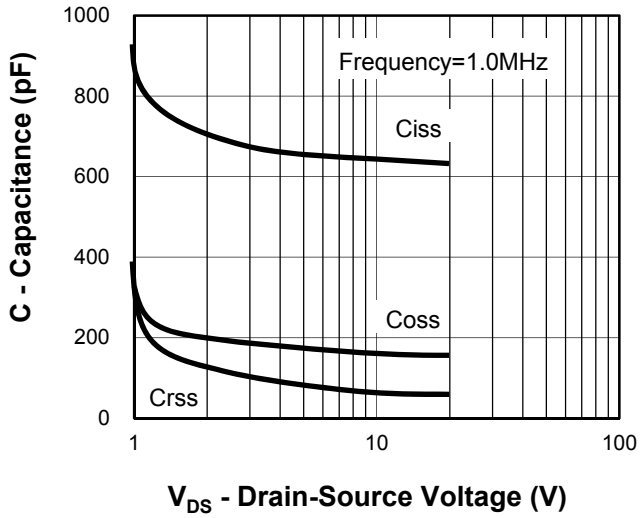
Drain-Source On Resistance



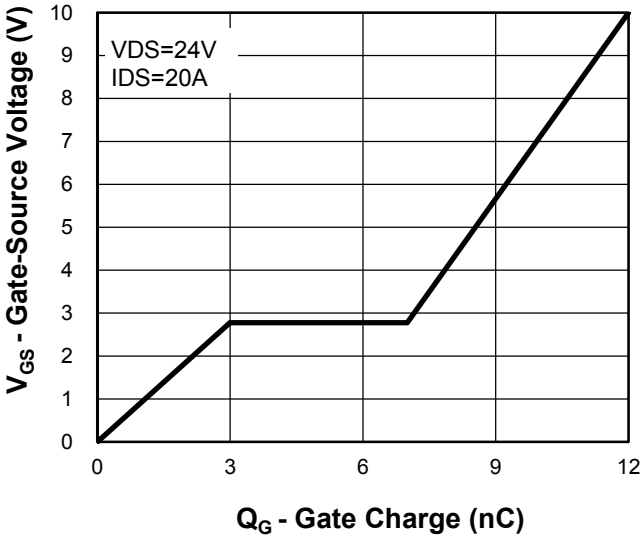
Source-Drain Diode Forward



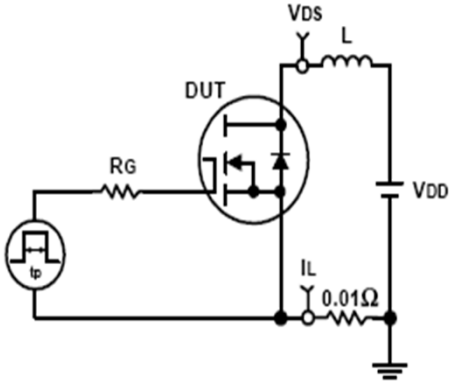
Capacitance

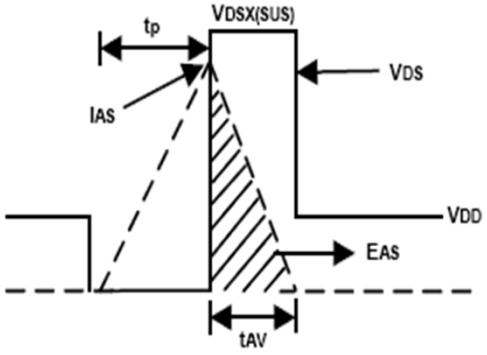


Gate Charge

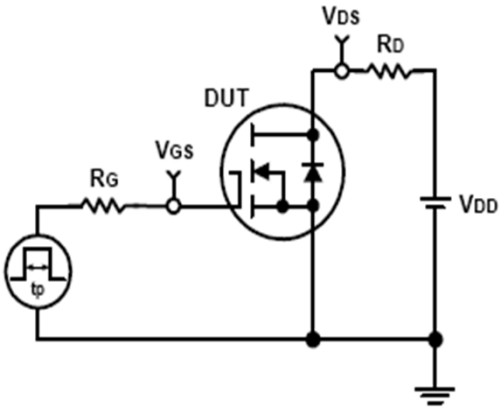


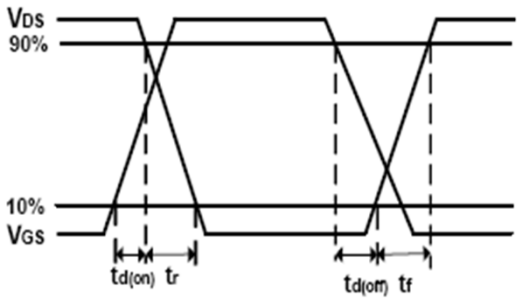
Avalanche Test Circuit and Waveforms





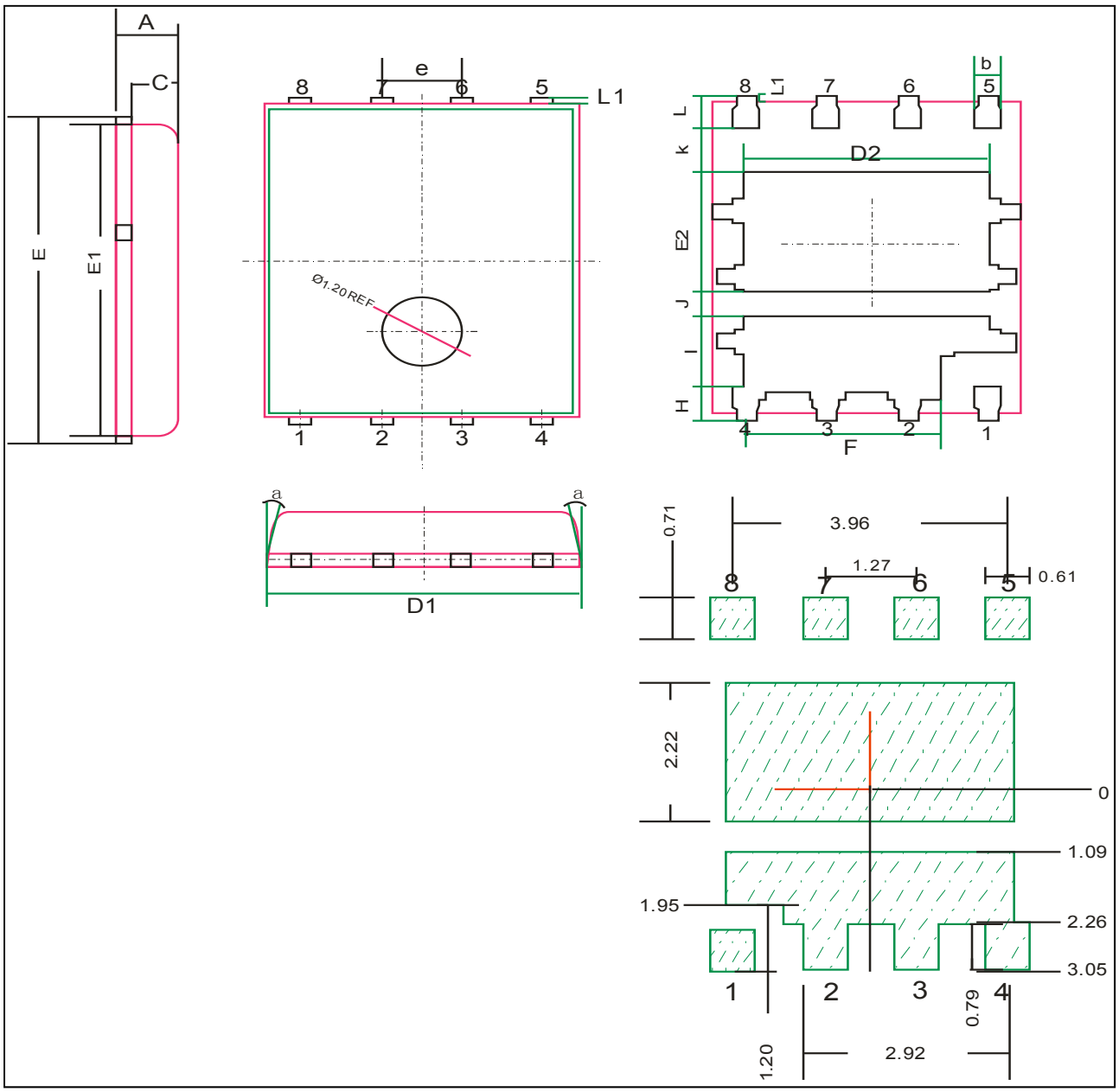
Switching Time Test Circuit and Waveforms





Package Information

PDFN5060



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	2.02	2.17	2.32	0.079	0.085	0.091
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	0.48	0.58	0.68	0.018	0.022	0.026
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	0.50	*	*	0.019	*	*	J	0.40	0.50	0.60	0.015	0.019	0.023
I	1.22	1.32	1.42	0.048	0.051	0.055	F	2.87	3.07	3.22	0.112	0.12	0.126

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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