

Features

- 40V/50A,
 $R_{DS(ON)} = 4.8m\Omega(Typ.)@V_{GS}=10V$
 $R_{DS(ON)} = 7.2m\Omega(Typ.)@V_{GS}=4.5V$
- Excellent $Q_G \times R_{DS(on)}$ product(FOM)
- SGT Technology
- Fast Switching Speed
- 100% avalanche tested

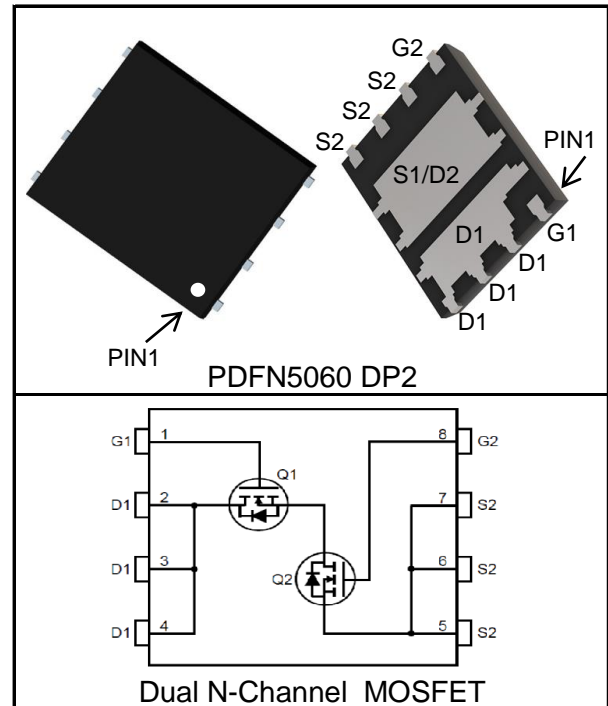
Applications

- Switching Application Systems
- DC/DC Converter



Halogen-Free

Pin Description



Absolute Maximum Ratings

Symbol	Parameter	Rating	Unit	
Common Ratings ($T_C=25^\circ\text{C}$ Unless Otherwise Noted)				
V_{DSS}	Drain-Source Voltage	40	V	
V_{GSS}	Gate-Source Voltage	± 20		
T_J	Maximum Junction Temperature	150	$^\circ\text{C}$	
T_{STG}	Storage Temperature Range	-55 to 150	$^\circ\text{C}$	
I_S	Diode Continuous Forward Current	$T_C=25^\circ\text{C}$	50	A
Mounted on Large Heat Sink				
$I_{DP}^{①}$	300 μs Pulse Drain Current Tested	$T_C=25^\circ\text{C}$	200	A
$I_D^{②}$	Continuous Drain Current@ $T_C(V_{GS}=10V)$	$T_C=25^\circ\text{C}$	50	A
		$T_C=100^\circ\text{C}$	32	
	Continuous Drain Current@ $T_A(V_{GS}=10V)^{③}$	$T_A=25^\circ\text{C}$	17	
		$T_A=70^\circ\text{C}$	14	
P_D	Maximum Power Dissipation@ T_C	$T_C=25^\circ\text{C}$	27	W
		$T_C=100^\circ\text{C}$	11	
	Maximum Power Dissipation@ $T_A^{③}$	$T_A=25^\circ\text{C}$	3.1	
		$T_A=70^\circ\text{C}$	2	

Symbol	Parameter	Rating	Unit
$R_{\theta JC}$	Thermal Resistance-Junction to Case	4.7	°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	25	mJ

Electrical Characteristics ($T_C=25^\circ\text{C}$ Unless Otherwise Noted)

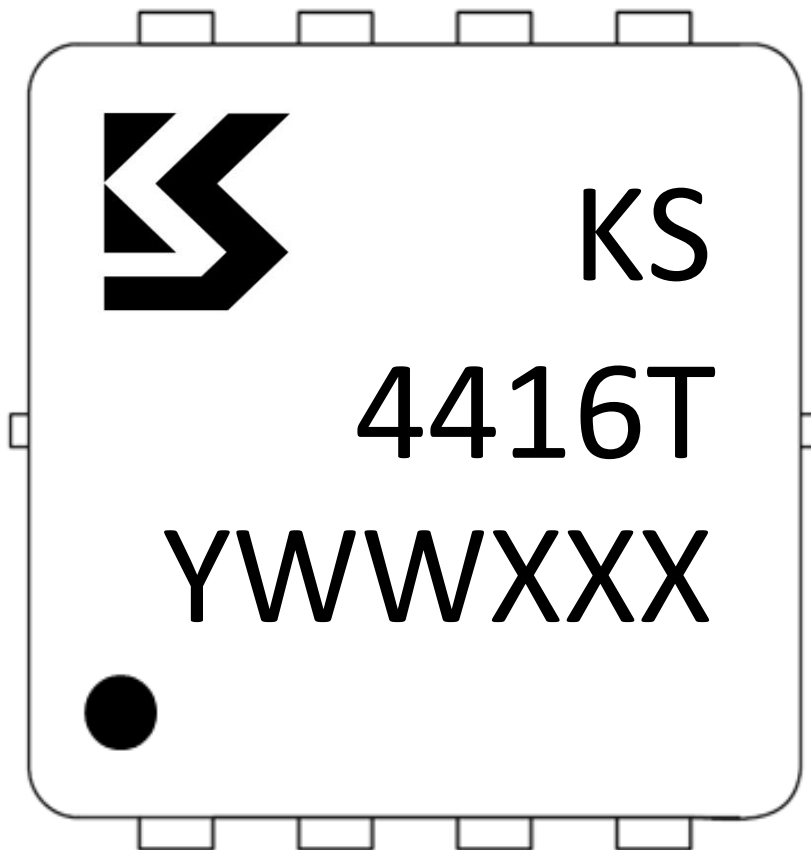
Symbol	Parameter	Test Condition	KS4416NA2T			Unit
			Min.	Typ.	Max.	
Static Characteristics						
BV_{DSS}	Drain-Source Breakdown Voltage	$V_{GS}=0V, I_{DS}=250\mu A$	40			V
I_{DSS}	Zero Gate Voltage Drain Current	$V_{DS}=40V, V_{GS}=0V$			1	μA
		$T_J=125^\circ\text{C}$			30	
$V_{GS(th)}$	Gate Threshold Voltage	$V_{DS}=V_{GS}, I_{DS}=250\mu A$	1.2	1.8	2.3	V
I_{GSS}	Gate Leakage Current	$V_{GS}=\pm 20V, V_{DS}=0V$			± 100	nA
$R_{DS(ON)}$ ⑤	Drain-Source On-state Resistance	$V_{GS}=10V, I_{DS}=20A$		4.8	6	$m\Omega$
		$V_{GS}=4.5V, I_{DS}=15A$		7.2	9.5	$m\Omega$
Diode Characteristics						
V_{SD} ⑤	Diode Forward Voltage	$I_{SD}=20A, V_{GS}=0V$		0.86	1.2	V
t_{rr}	Reverse Recovery Time	$I_{SD}=20A, dI_{SD}/dt=100A/\mu s$		15		ns
Q_{rr}	Reverse Recovery Charge			28		nC
Dynamic Characteristics ⑥						
R_G	Gate Resistance	$V_{GS}=0V, V_{DS}=0V, F=1\text{MHz}$		1.3		Ω
C_{iss}	Input Capacitance	$V_{GS}=0V, V_{DS}=20V, \text{Frequency}=1.0\text{MHz}$		1375		μF
C_{oss}	Output Capacitance			270		
C_{rss}	Reverse Transfer Capacitance			25		
$t_{d(ON)}$	Turn-on Delay Time	$V_{DD}=20V, I_{DS}=20A, V_{GS}=10V, R_G=6\Omega$		9		ns
t_r	Turn-on Rise Time			11		
$t_{d(OFF)}$	Turn-off Delay Time			25		
t_f	Turn-off Fall Time			8		
Gate Charge Characteristics ⑥						
Q_g	Total Gate Charge	$V_{DS}=20V, V_{GS}=10V, I_{DS}=20A$		19		nC
Q_{gs}	Gate-Source Charge			5.2		
Q_{gd}	Gate-Drain Charge			4.1		

Notes:

- ①Pulse width limited by safe operating area.
- ②Calculated continuous current based on maximum allowable junction temperature.
- ③When mounted on 1 inch square copper board, $t \leq 10\text{sec}$.
- ④Limited by $T_{J\text{max}}$, $I_{AS} = 10\text{A}$, $L = 0.5\text{mH}$, $V_{DD} = 24\text{V}$, $R_G = 25\Omega$, Starting $T_J = 25^\circ\text{C}$.
- ⑤Pulse test; Pulse width $\leq 300\mu\text{s}$, duty cycle $\leq 2\%$.
- ⑥Guaranteed by design, not subject to production testing.

Ordering and Marking Information

Device	Package	Packaging	Quantity	Reel Size	Tape width
KS4416NA2T	PDFN5060 DP2	Tape&Reel	5000	13"	12mm

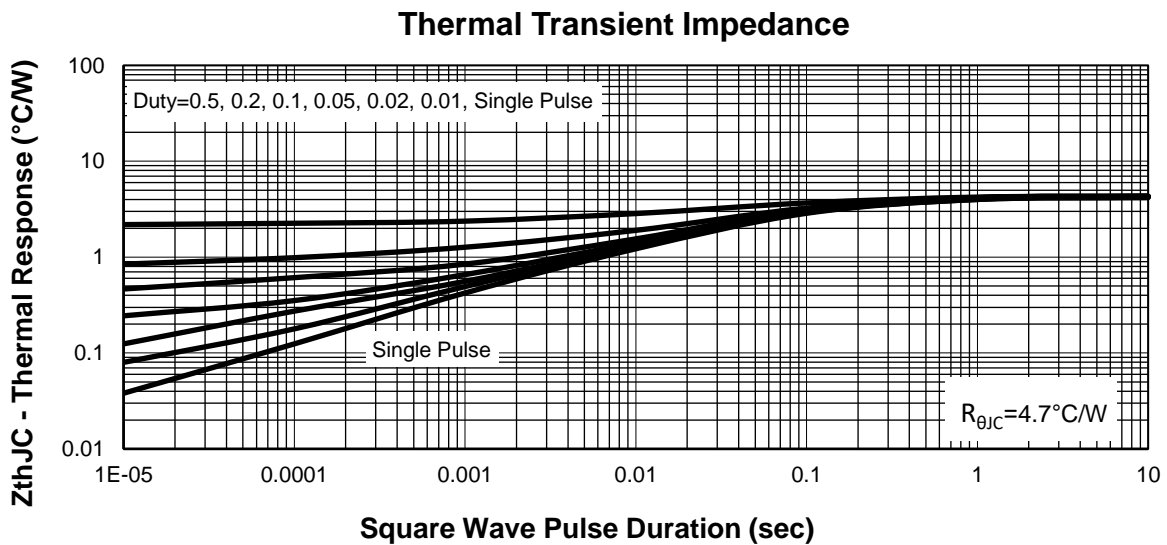
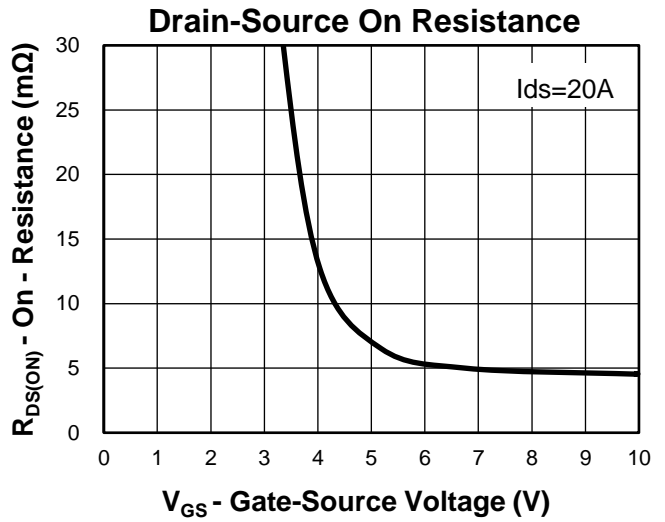
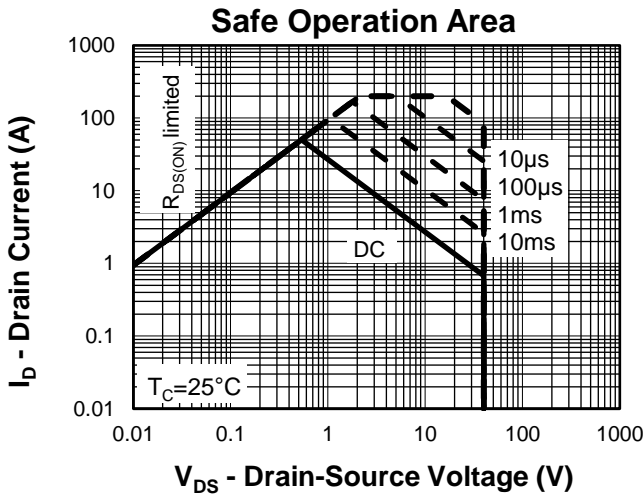
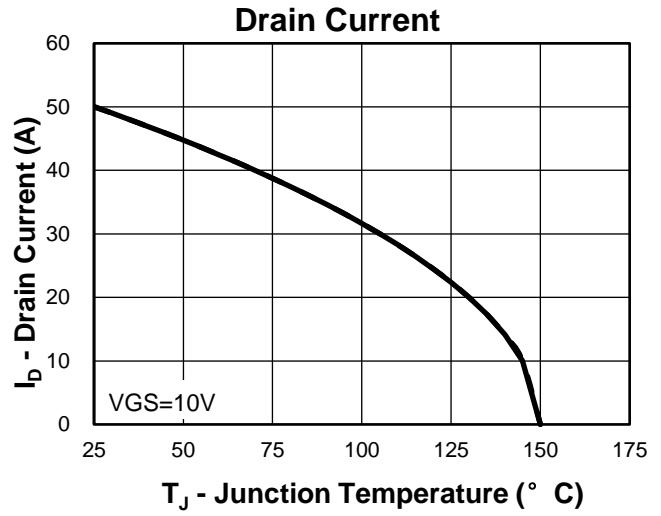
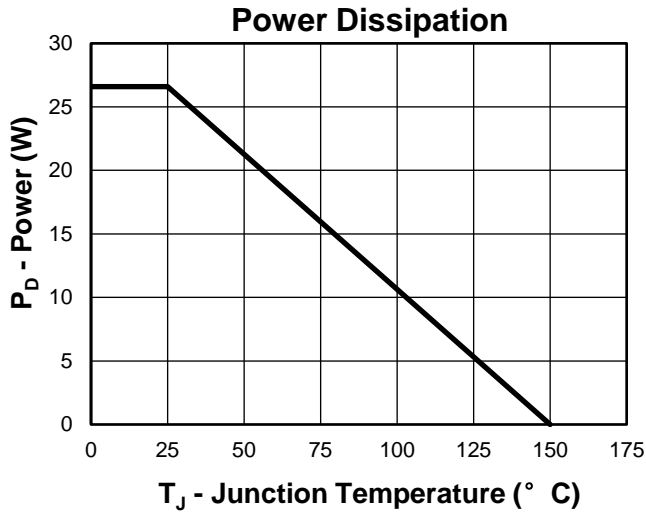


1st Line: Kwansemi LOGO, Kwansemi Code(KS)

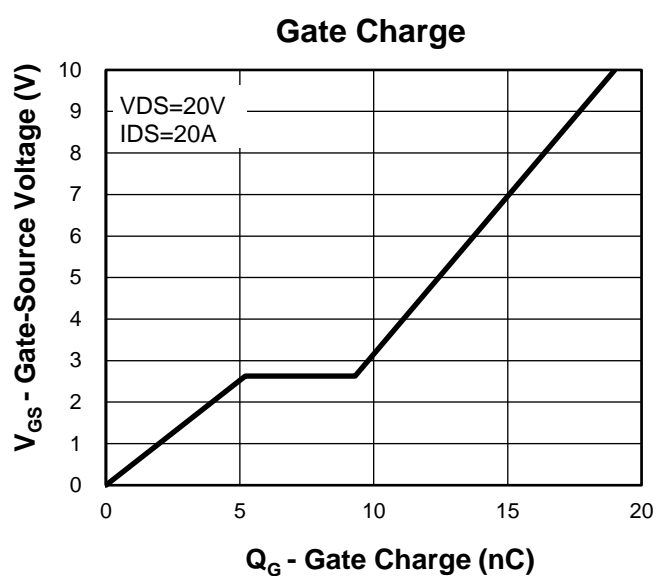
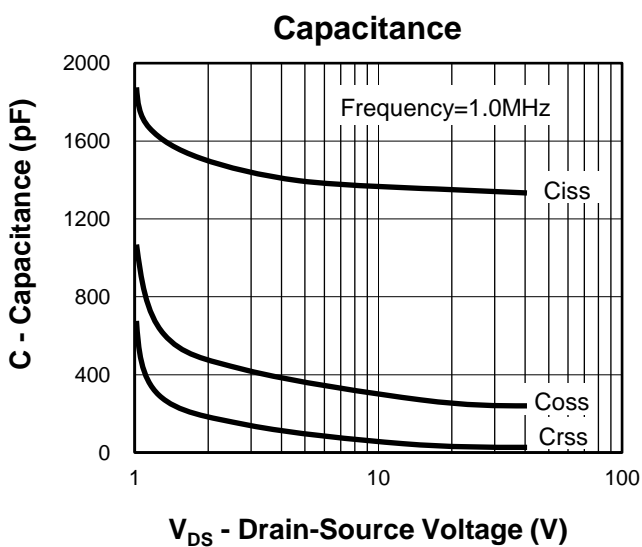
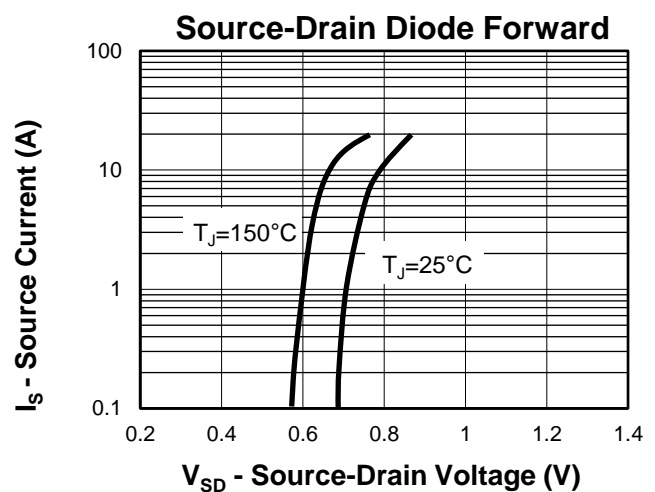
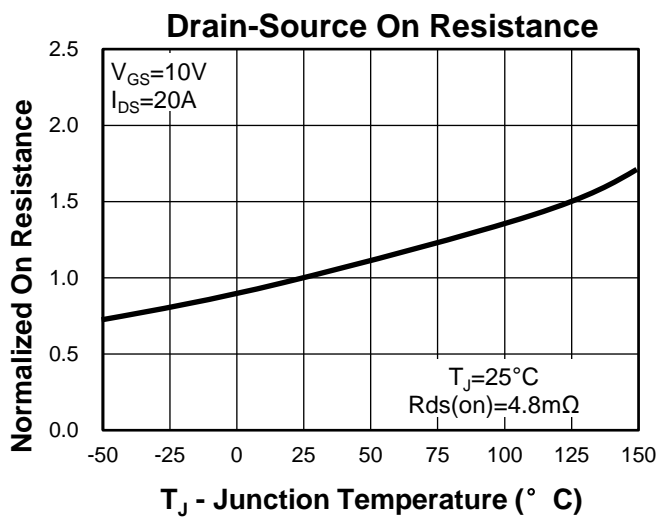
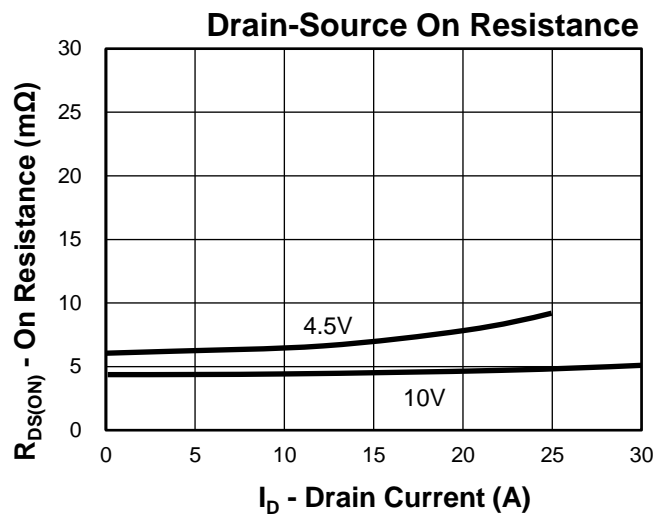
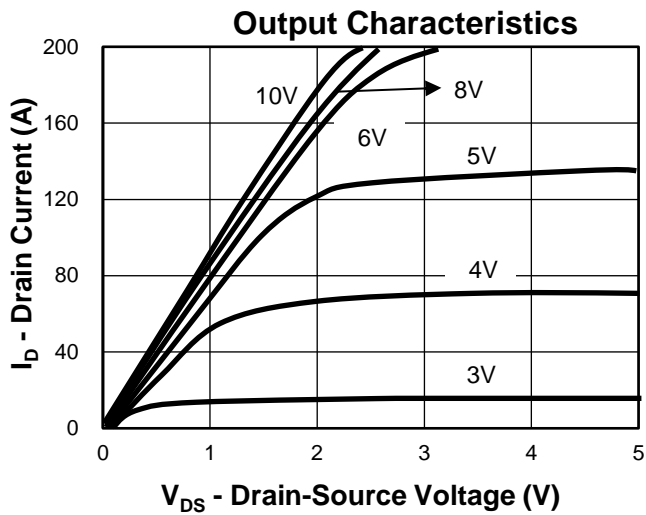
2nd Line: Part Number(4416T)

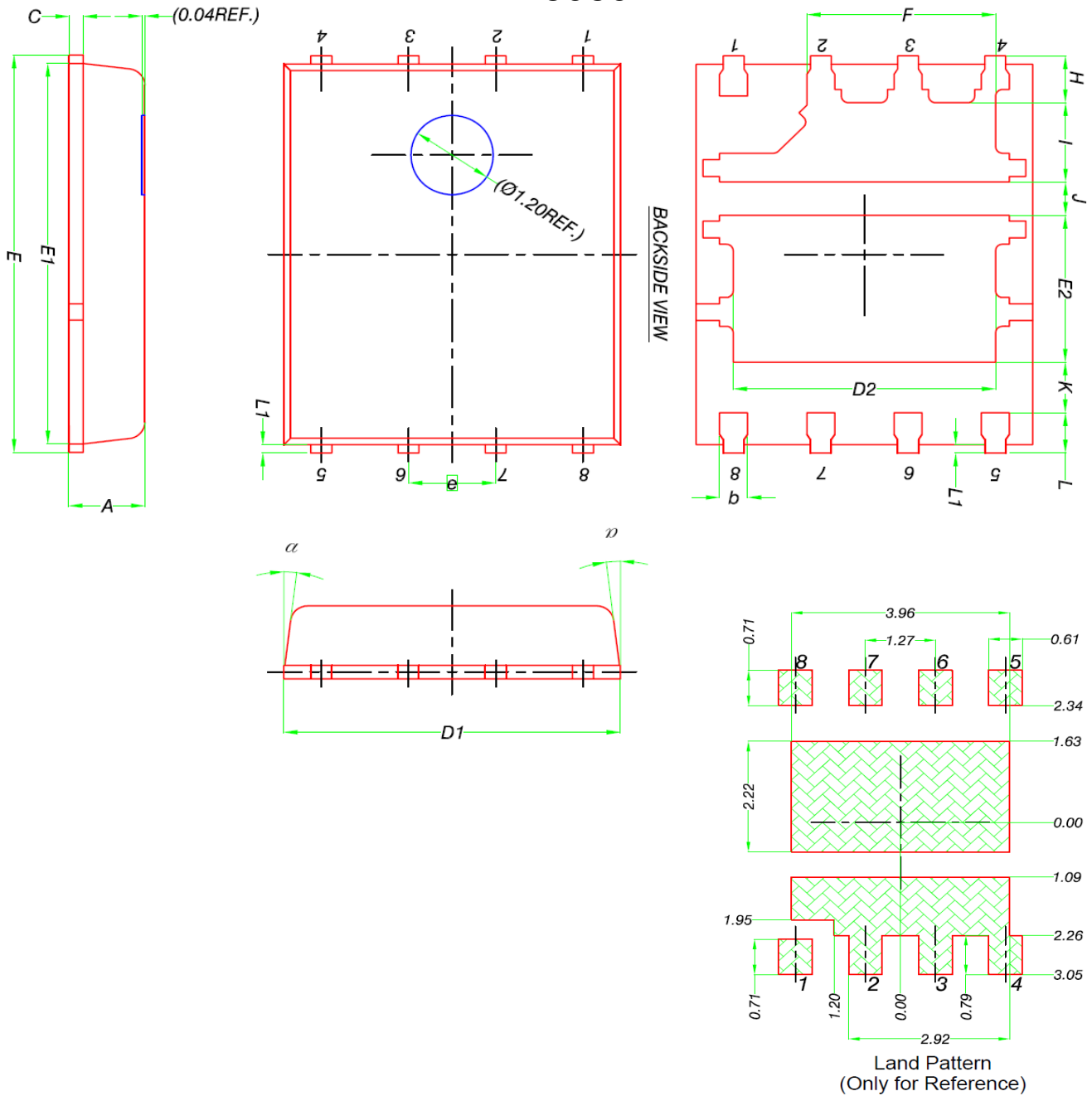
3rd Line: Lot Number(YWWXXX)

Typical Characteristics



Typical Characteristics



Package Information
PDFN5060 DP2

**Land Pattern
(Only for Reference)**

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	F	2.55	2.75	2.90	0.100	0.108	0.114
b	0.33	0.41	0.51	0.013	0.016	0.020	H	0.61	0.71	0.81	0.024	0.028	0.032
C	0.20	0.25	0.30	0.008	0.010	0.012	I	1.10	1.20	1.30	0.043	0.047	0.051
D1	4.80	4.90	5.00	0.189	0.193	0.197	J	0.40	0.50	0.60	0.016	0.020	0.024
D2	3.61	3.81	3.96	0.142	0.150	0.156	K	0.50	*	*	0.020	*	*
E	5.90	6.00	6.10	0.232	0.236	0.240	L	0.51	0.61	0.71	0.020	0.024	0.028
E1	5.70	5.75	5.80	0.224	0.226	0.228	L1	0.06	0.13	0.20	0.002	0.005	0.008
E2	2.02	2.22	2.42	0.080	0.087	0.095	a	0°	*	12°	0°	*	12°
e	1.27 BSC			0.050 BSC									

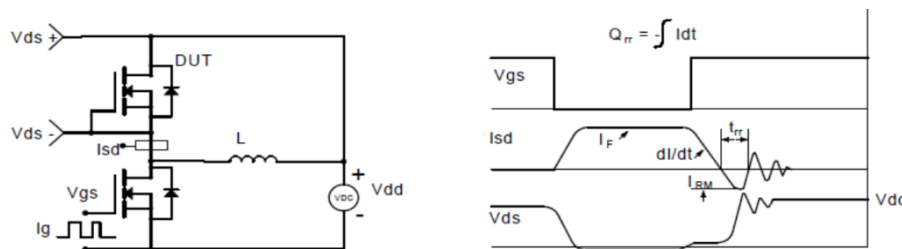
Avalanche Test Circuit and Waveforms



Switching Time Test Circuit and Waveforms



Diode Recovery Test Circuit and Waveforms



Gate Charge Test Circuit and Waveform



Customer Service

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