

### Features

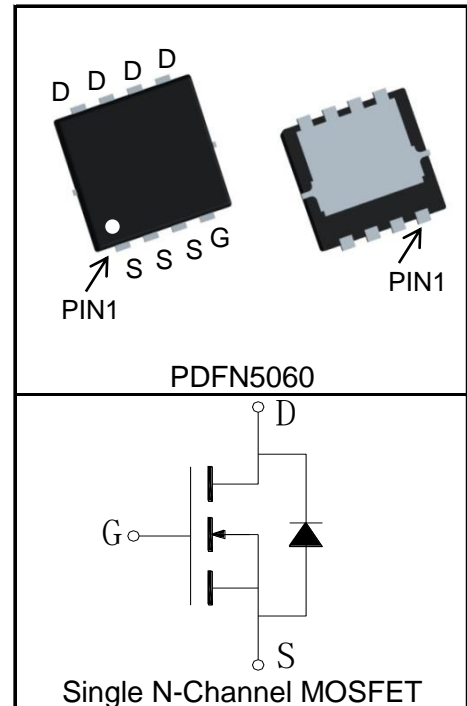
- 20V/55A,  
 $R_{DS(ON)} = 5.5m\Omega(Typ.)@V_{GS}=4.5V$   
 $R_{DS(ON)} = 7m\Omega(Typ.)@V_{GS}=2.5V$
- Low  $R_{DS(ON)}$
- Super High Dense Cell Design
- Fast Switching Speed
- 100% avalanche tested

### Applications

- Switching Application Systems



### Pin Description



### Absolute Maximum Ratings

Symbol	Parameter	Rating	Unit	
<b>Common Ratings</b> ( $T_C=25^\circ C$ Unless Otherwise Noted)				
$V_{DSS}$	Drain-Source Voltage	20	V	
$V_{GSS}$	Gate-Source Voltage	$\pm 12$	V	
$T_J$	Maximum Junction Temperature	150	$^\circ C$	
$T_{STG}$	Storage Temperature Range	-55 to 150	$^\circ C$	
$I_S$	Diode Continuous Forward Current	$T_C=25^\circ C$	55 A	
<b>Mounted on Large Heat Sink</b>				
$I_{DP}^{①}$	300 $\mu s$ Pulse Drain Current Tested	$T_C=25^\circ C$	220 A	
$I_D^{②}$	Continuous Drain Current@ $T_C(V_{GS}=4.5V)$	$T_C=25^\circ C$	55	A
		$T_C=100^\circ C$	35	
	Continuous Drain Current@ $T_A(V_{GS}=4.5V)^{③}$	$T_A=25^\circ C$	20	
		$T_A=70^\circ C$	16	
$P_D$	Maximum Power Dissipation@ $T_C$	$T_C=25^\circ C$	31	W
		$T_C=100^\circ C$	13	
	Maximum Power Dissipation@ $T_A^{③}$	$T_A=25^\circ C$	4.2	
		$T_A=70^\circ C$	2.7	

Symbol	Parameter	Rating	Unit
$R_{\theta JC}$	Thermal Resistance-Junction to Case	4	°C/W
$R_{\theta JA}$ ③	Thermal Resistance-Junction to Ambient	30	°C/W
<b>Drain-Source Avalanche Ratings</b>			
$E_{AS}$ ④	Avalanche Energy, Single Pulsed	25	mJ

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

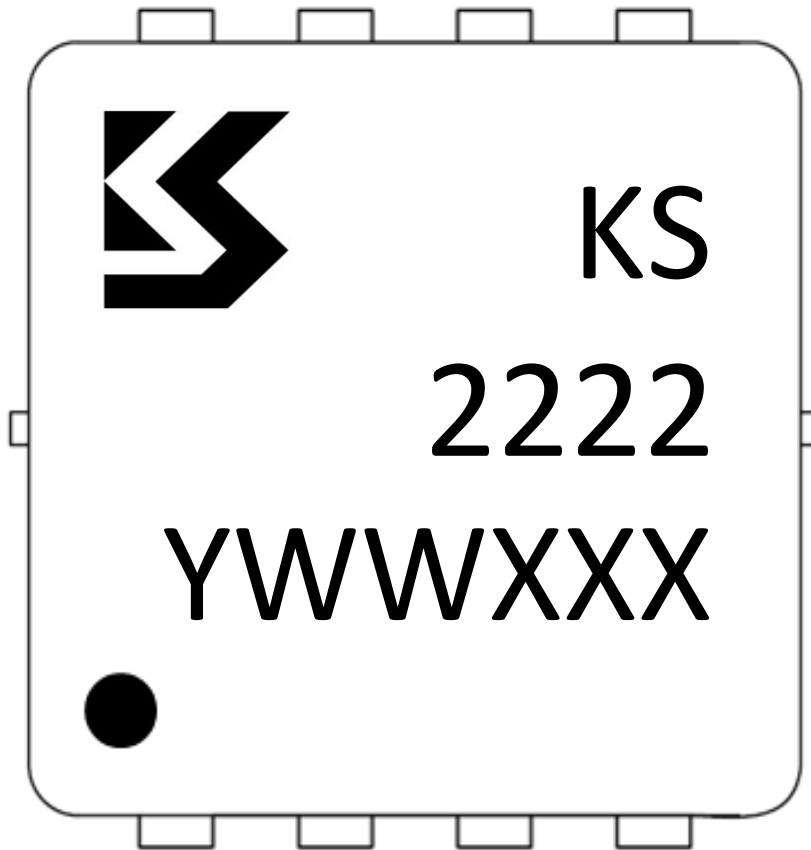
Symbol	Parameter	Test Condition	KS2222NB			Unit
			Min.	Typ.	Max.	
<b>Static Characteristics</b>						
$BV_{DSS}$	Drain-Source Breakdown Voltage	$V_{GS}=0V, I_{DS}=250\mu A$	20			V
$I_{DSS}$	Zero Gate Voltage Drain Current	$V_{DS}=20V, V_{GS}=0V$			1	$\mu A$
		$T_J=125^\circ\text{C}$			30	
$V_{GS(th)}$	Gate Threshold Voltage	$V_{DS}=V_{GS}, I_{DS}=250\mu A$	0.4	0.7	1	V
$I_{GSS}$	Gate Leakage Current	$V_{GS}=\pm 12V, V_{DS}=0V$			$\pm 100$	nA
$R_{DS(ON)}$ ⑤	Drain-Source On-state Resistance	$V_{GS}=4.5V, I_{DS}=10A$		5.5	7	$m\Omega$
		$V_{GS}=2.5V, I_{DS}=4A$		7	10	$m\Omega$
<b>Diode Characteristics</b>						
$V_{SD}$ ⑤	Diode Forward Voltage	$I_{SD}=20A, V_{GS}=0V$		0.86	1.2	V
$t_{rr}$	Reverse Recovery Time	$I_{SD}=20A, dI_{SD}/dt=100A/\mu s$		10		ns
$Q_{rr}$	Reverse Recovery Charge			21		nC
<b>Dynamic Characteristics</b> ⑥						
$R_G$	Gate Resistance	$V_{GS}=0V, V_{DS}=0V, F=1\text{MHz}$		2.3		$\Omega$
$C_{iss}$	Input Capacitance	$V_{GS}=0V,$ $V_{DS}=10V,$ Frequency=1.0MHz		1250		$\mu F$
$C_{oss}$	Output Capacitance			215		
$C_{riss}$	Reverse Transfer Capacitance			170		
$t_{d(ON)}$	Turn-on Delay Time	$V_{DD}=10V, I_{DS}=10A,$ $V_{GS}=4.5V, R_G=3\Omega$		3		ns
$t_r$	Turn-on Rise Time			6		
$t_{d(OFF)}$	Turn-off Delay Time			11		
$t_f$	Turn-off Fall Time			8		
<b>Gate Charge Characteristics</b> ⑥						
$Q_g$	Total Gate Charge	$V_{DS}=10V, V_{GS}=4.5V,$ $I_{DS}=10A$		16		nC
$Q_{gs}$	Gate-Source Charge			7		
$Q_{gd}$	Gate-Drain Charge			6		

**Notes:**

- ①Pulse width limited by safe operating area.
- ②Calculated continuous current based on maximum allowable junction temperature. The package limitation current is 50A.
- ③When mounted on 1 inch square copper board,  $t \leq 10\text{sec}$ .
- ④Limited by  $T_{Jmax}$ ,  $I_{AS} = 10\text{A}$ ,  $L = 0.5\text{mH}$ ,  $V_{DD} = 10\text{V}$ ,  $R_G = 25\Omega$ , 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
KS2222NB	PDFN5060	Tape&Reel	5000	13"	12mm

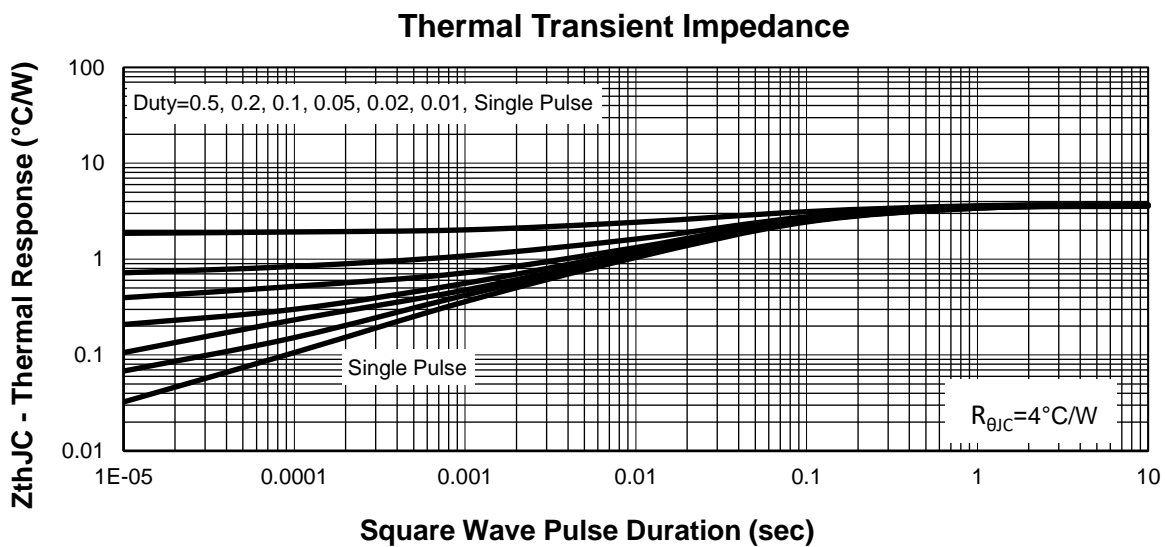
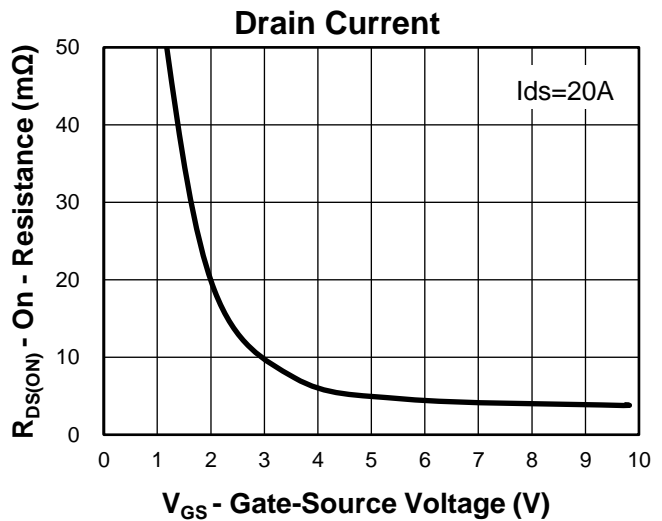
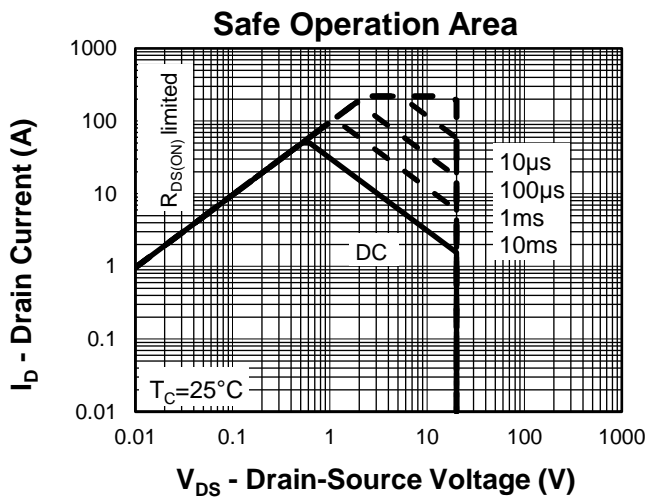
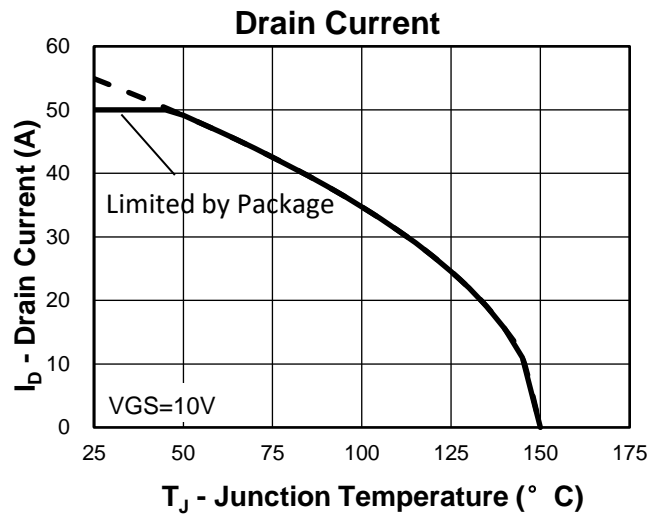
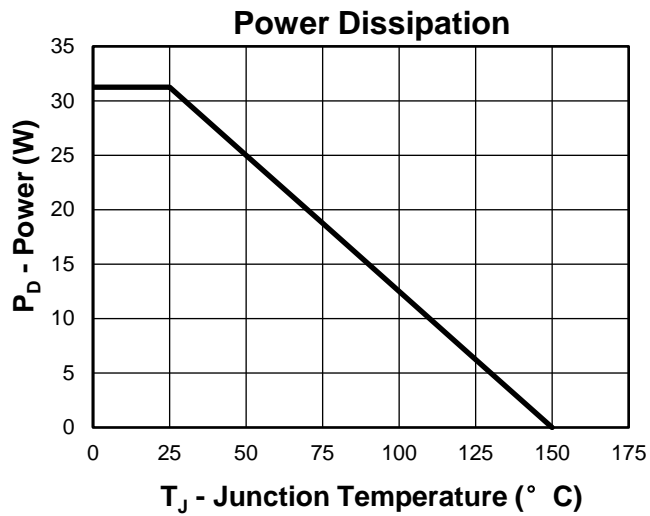


Y =Year,2017-A,2018-B,etc.

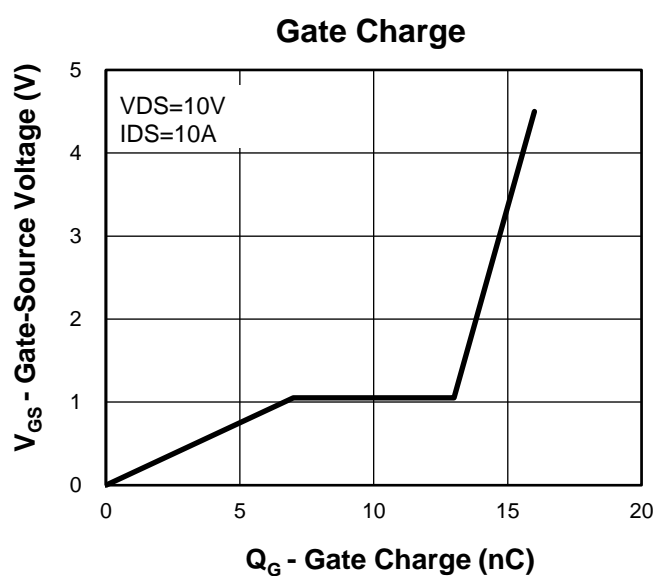
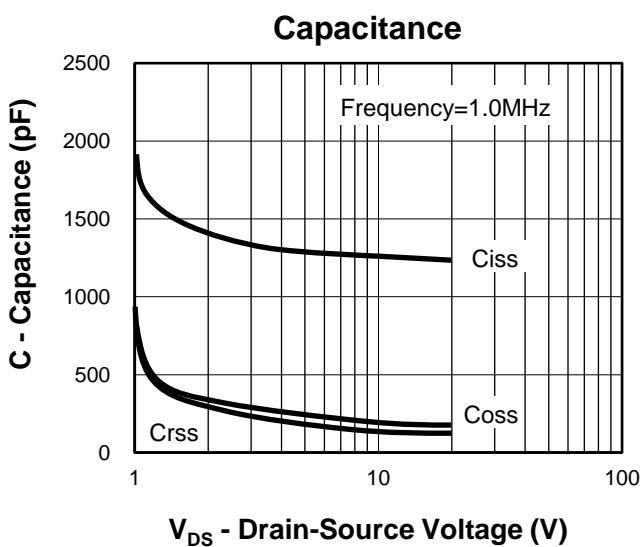
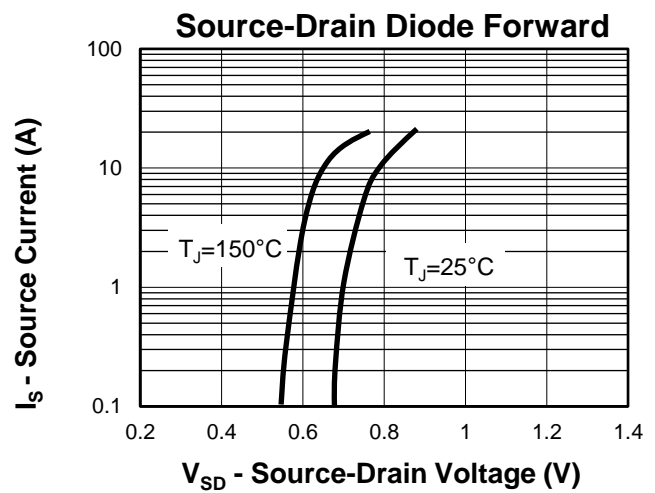
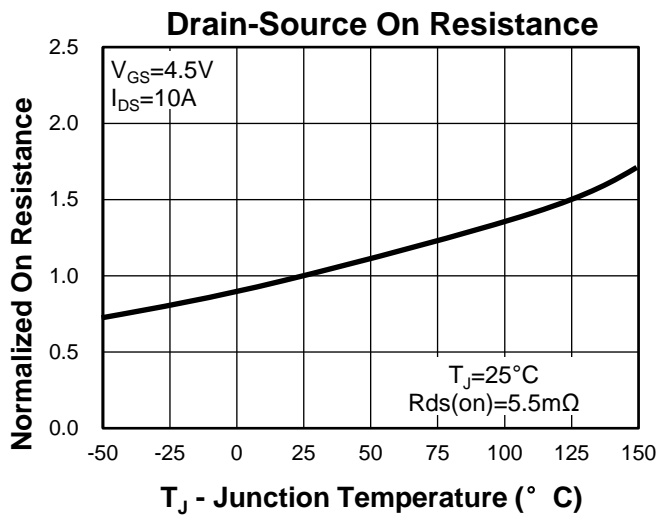
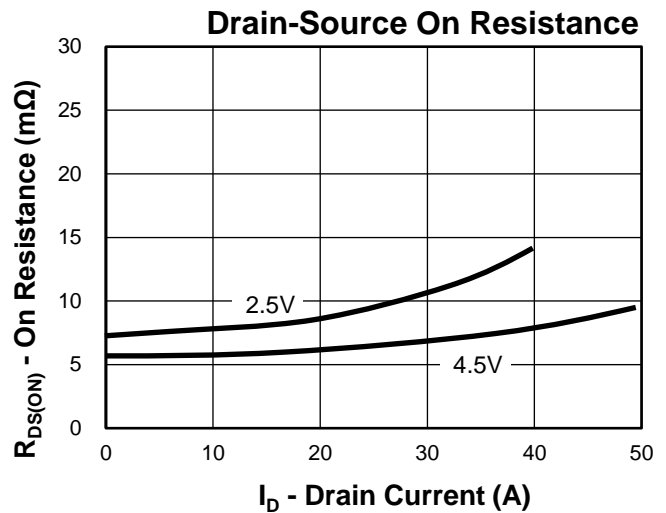
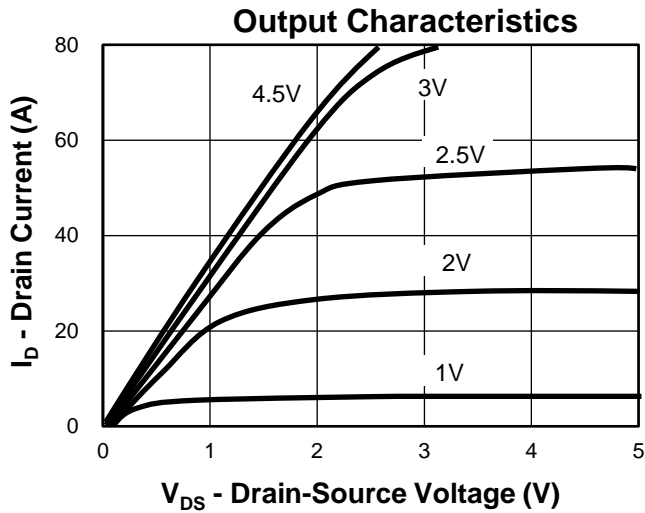
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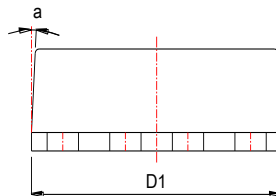
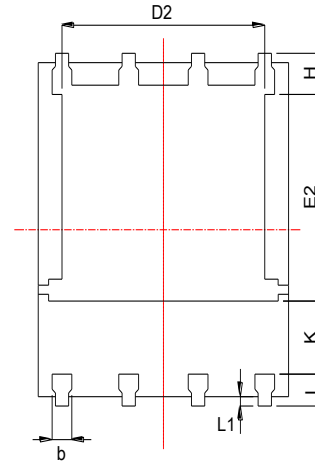
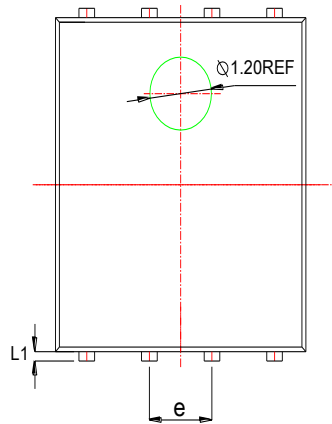
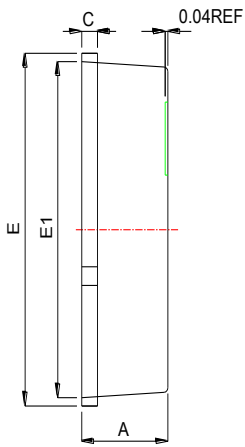
XXX =Lot number.

### Typical Characteristics

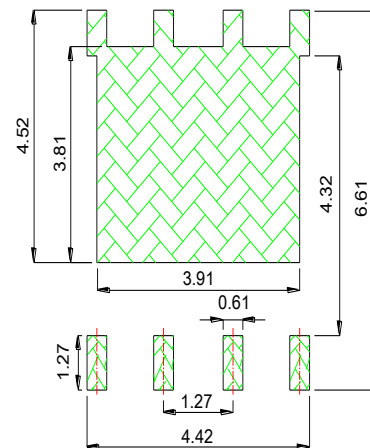


### Typical Characteristics



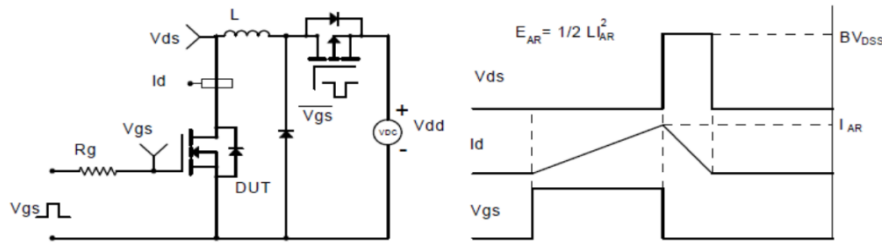
**Package Information**
**PDFN5060**


Land Pattern  
(Only for Reference)

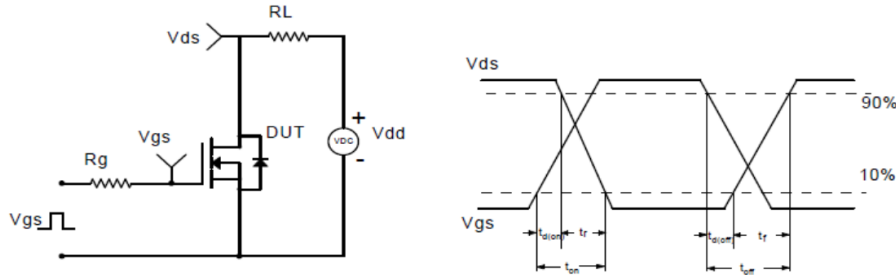


SYMBOL	MM			INCH		
	MIN	NOM	MAX	MIN	NOM	MAX
A	0.90	1.00	1.10	0.035	0.039	0.043
b	0.33	0.42	0.51	0.013	0.017	0.020
c	0.20	0.25	0.30	0.008	0.010	0.012
D1	4.80	4.90	5.00	0.189	0.193	0.197
D2	3.61	3.79	3.96	0.142	0.149	0.156
E	5.90	6.00	6.10	0.232	0.236	0.240
E1	5.65	5.75	5.85	0.222	0.226	0.230
E2	3.38	3.58	3.78	0.133	0.141	0.149
e	1.27 BSC			0.050 BSC		
H	0.41	0.51	0.61	0.016	0.020	0.024
k	1.10			0.043		
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
a	0°		12°	0°		12°

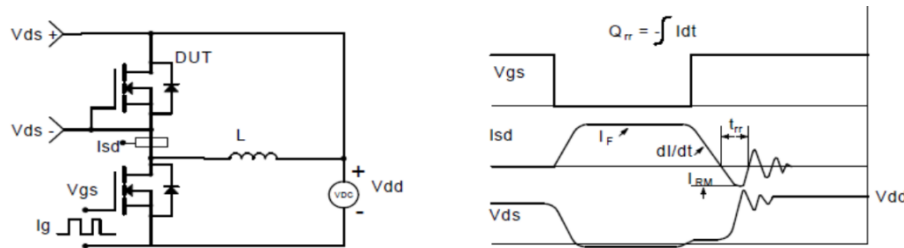
### Avalanche Test Circuit and Waveforms



### Switching Time Test Circuit and Waveforms



### Diode Recovery Test Circuit and Waveforms



### Gate Charge Test Circuit and Waveform



### Customer Service

Kwansemi Semiconductor Co.,Ltd

Email:Sales@kwansemi.com

Web:www.kwansemi.com

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