

## Features

- -16V/-13A,  
 $R_{DS(ON)} = 10m\Omega(Typ.)@V_{GS}=-4.5V$   
 $R_{DS(ON)} = 14m\Omega(Typ.)@V_{GS}=-2.5V$
- Low  $R_{DS(ON)}$
- Super High Dense Cell Design
- Reliable and Rugged

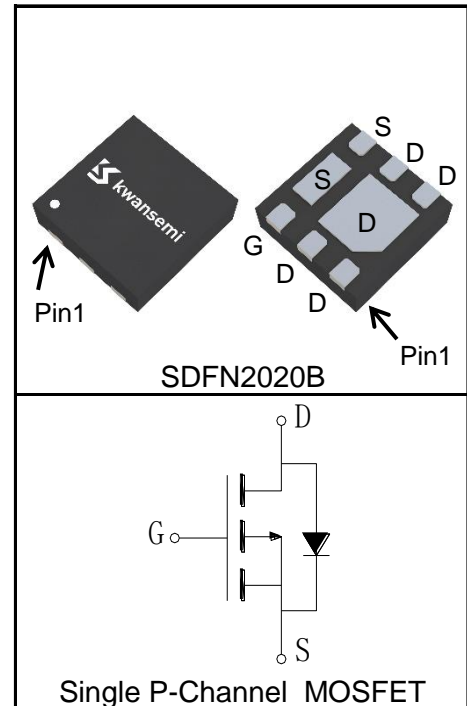
## Applications

- Load Switch
- PWM Applications



Halogen-Free

## Pin Description



## Absolute Maximum Ratings

Symbol	Parameter	Rating	Unit
<b>Common Ratings</b> ( $T_A=25^\circ\text{C}$ Unless Otherwise Noted)			
$V_{DSS}$	Drain-Source Voltage	-16	V
$V_{GSS}$	Gate-Source Voltage	$\pm 12$	
$T_J$	Maximum Junction Temperature	150	$^\circ\text{C}$
$T_{STG}$	Storage Temperature Range	-55 to 150	$^\circ\text{C}$
$I_S$	Diode Continuous Forward Current	$T_A=25^\circ\text{C}$ -2.6	A
<b>Mounted on Large Heat Sink</b>			
$I_{DP}^{①}$	300 $\mu\text{s}$ Pulse Drain Current Tested	$T_A=25^\circ\text{C}$ -52	A
$I_D^{②}$	Continuous Drain Current( $V_{GS}=-4.5V$ )	$T_A=25^\circ\text{C}$ -13	A
		$T_A=70^\circ\text{C}$ -10	
$P_D$	Maximum Power Dissipation	$T_A=25^\circ\text{C}$ 2.5	W
		$T_A=70^\circ\text{C}$ 1.6	
$R_{\theta JC}$	Thermal Resistance-Junction to Case	4.5	$^\circ\text{C/W}$
$R_{\theta JA}^{③}$	Thermal Resistance-Junction to Ambient	50	$^\circ\text{C/W}$
<b>Drain-Source Avalanche Ratings</b>			
$E_{AS}^{④}$	Avalanche Energy, Single Pulsed	TBD	mJ

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

Symbol	Parameter	Test Condition	KS0324UA2			Unit
			Min.	Typ.	Max.	
<b>Static Characteristics</b>						
$BV_{DSS}$	Drain-Source Breakdown Voltage	$V_{GS}=0V, I_{DS}=-250\mu A$	-16	-18		V
$I_{DSS}$	Zero Gate Voltage Drain Current	$V_{DS}=-12V, V_{GS}=0V$			-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	-1.1	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	$V_{GS}=-4.5V, I_{DS}=-8A$		10	13	$m\Omega$
		$V_{GS}=-2.5V, I_{DS}=-6A$		14	20	$m\Omega$
<b>Diode Characteristics</b>						
$V_{SD}^{(5)}$	Diode Forward Voltage	$I_{SD}=-8A, V_{GS}=0V$		-0.86	-1.2	V
$t_{rr}$	Reverse Recovery Time	$I_{SD}=-8A, dI_{SD}/dt=-100A/\mu s$		14		ns
$Q_{rr}$	Reverse Recovery Charge			23		nC
<b>Dynamic Characteristics<sup>(6)</sup></b>						
$R_G$	Gate Resistance	$V_{GS}=0V, V_{DS}=0V, F=1\text{MHz}$		8		$\Omega$
$C_{iss}$	Input Capacitance	$V_{GS}=0V,$ $V_{DS}=-8V,$ Frequency=1.0MHz		1050		pF
$C_{oss}$	Output Capacitance			170		
$C_{rss}$	Reverse Transfer Capacitance			105		
$t_{d(ON)}$	Turn-on Delay Time	$V_{DD}=-8V, I_{DS}=-8A,$ $V_{GEN}=-4.5V, R_G=3\Omega$		14		ns
$t_r$	Turn-on Rise Time			29		
$t_{d(OFF)}$	Turn-off Delay Time			40		
$t_f$	Turn-off Fall Time			13		
<b>Gate Charge Characteristics<sup>(6)</sup></b>						
$Q_g$	Total Gate Charge	$V_{DS}=-8V, V_{GS}=-4.5V,$ $I_{DS}=-8A$		19		nC
$Q_{gs}$	Gate-Source Charge			4.2		
$Q_{gd}$	Gate-Drain Charge			5.6		

- 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,  $t \leq 10\text{sec}$ . The value in any given application depends on the user's specific board design.
  - ④ Limited by  $T_{Jmax}$ . Starting  $T_J = 25^\circ\text{C}$ .
  - ⑤ Pulse test; Pulse width  $\leq 300\mu s$ , duty cycle  $\leq 2\%$ .
  - ⑥ Guaranteed by design, not subject to production testing.

## Ordering and Marking Information

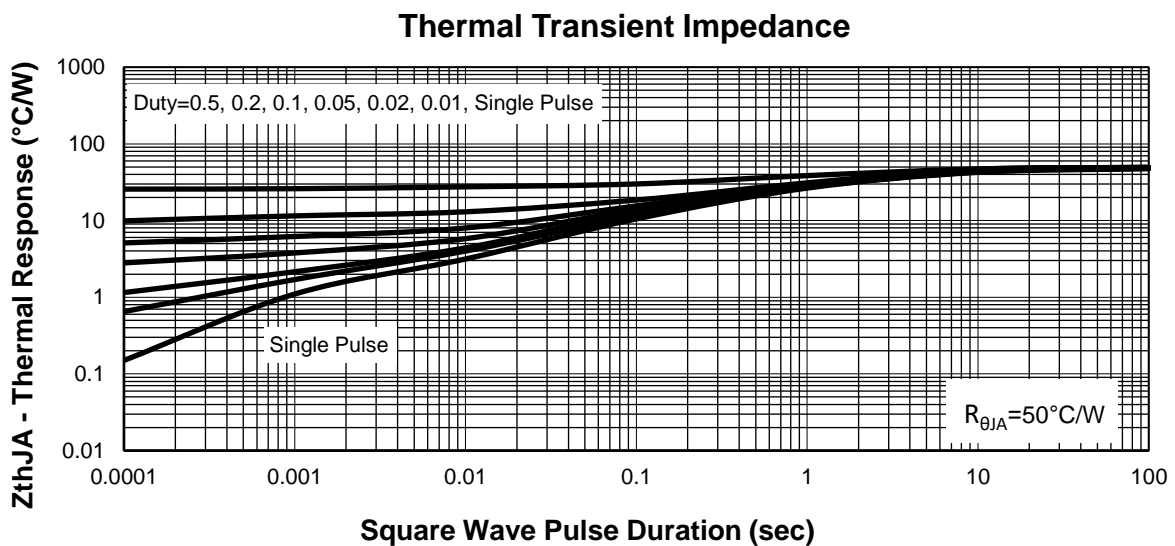
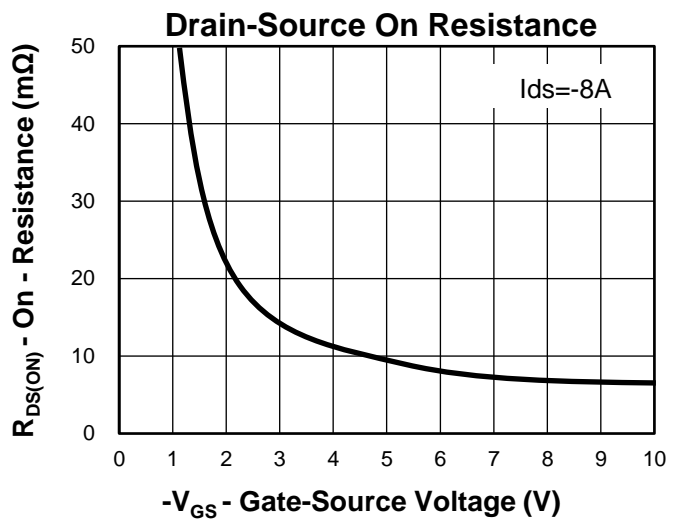
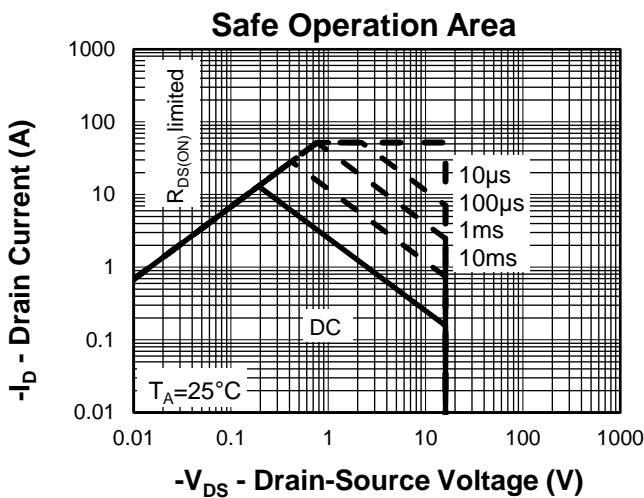
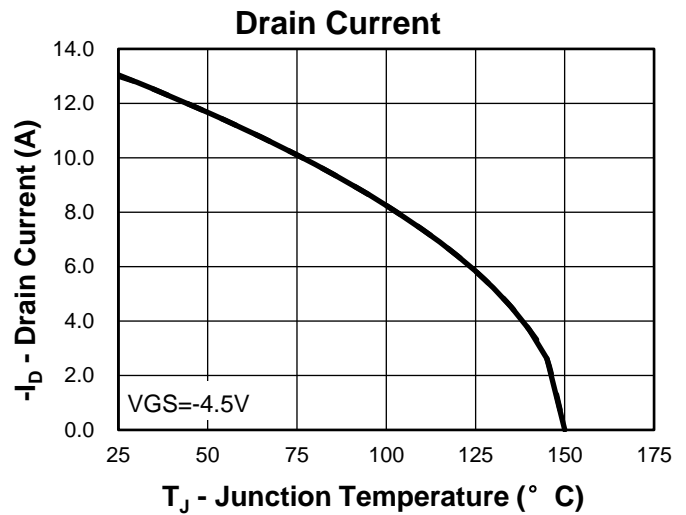
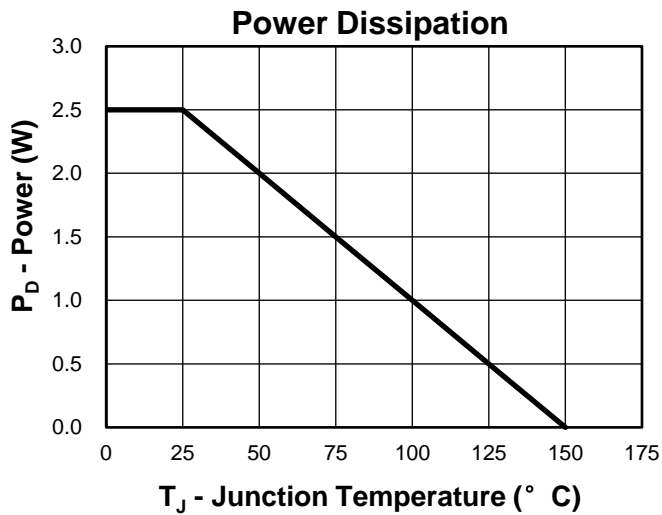
Device	Package	Packaging	Quantity	Reel Size	Tape width
KS0324UA2	SDFN2020B	Tape&Reel	3000	7"	8mm



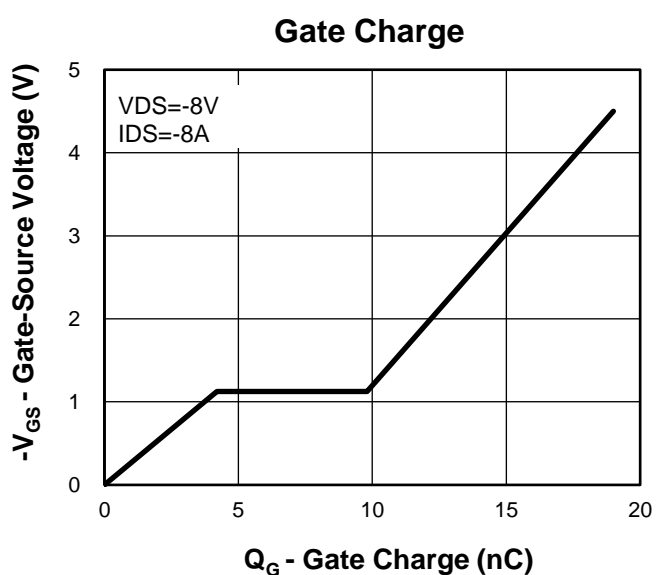
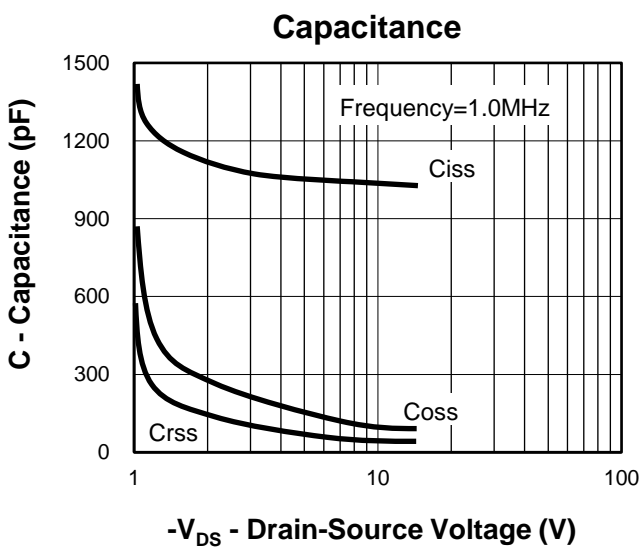
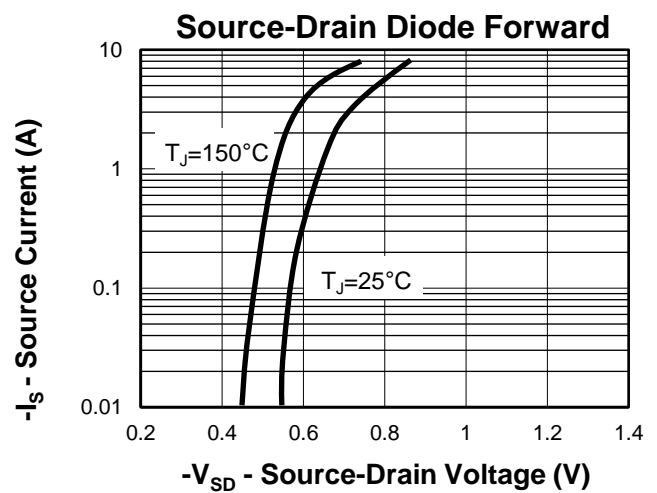
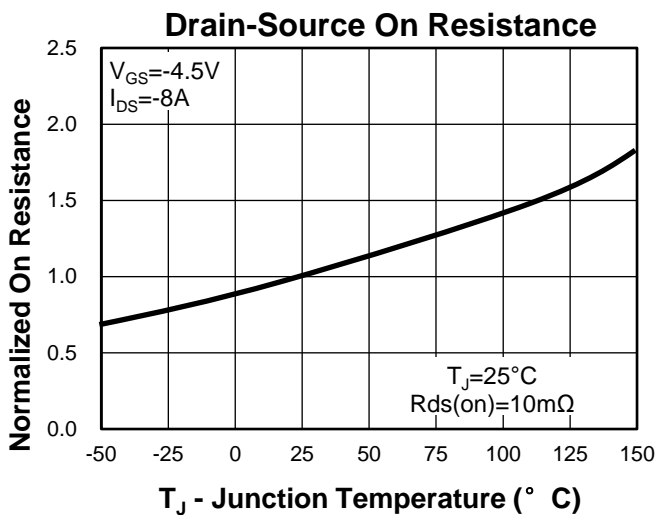
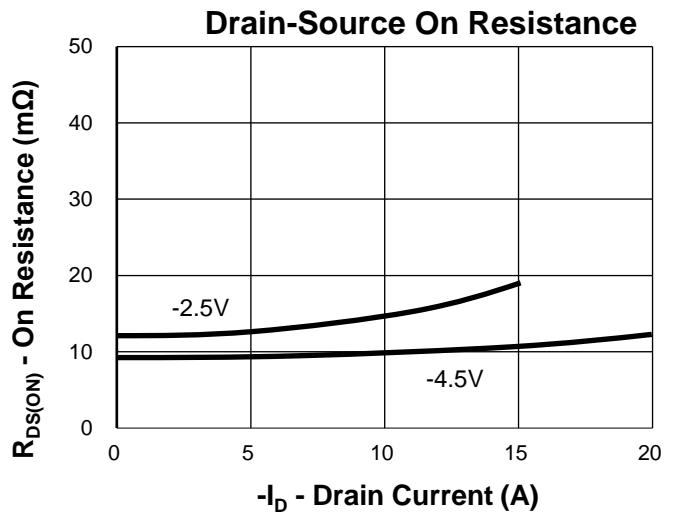
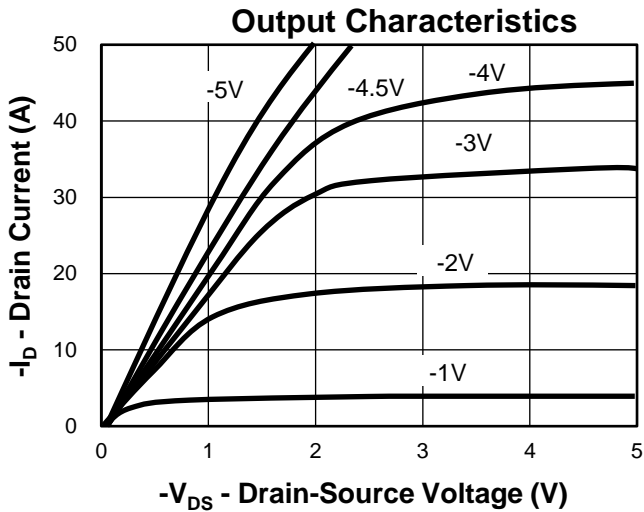
Y =Year,2017-A,2018-B,etc.

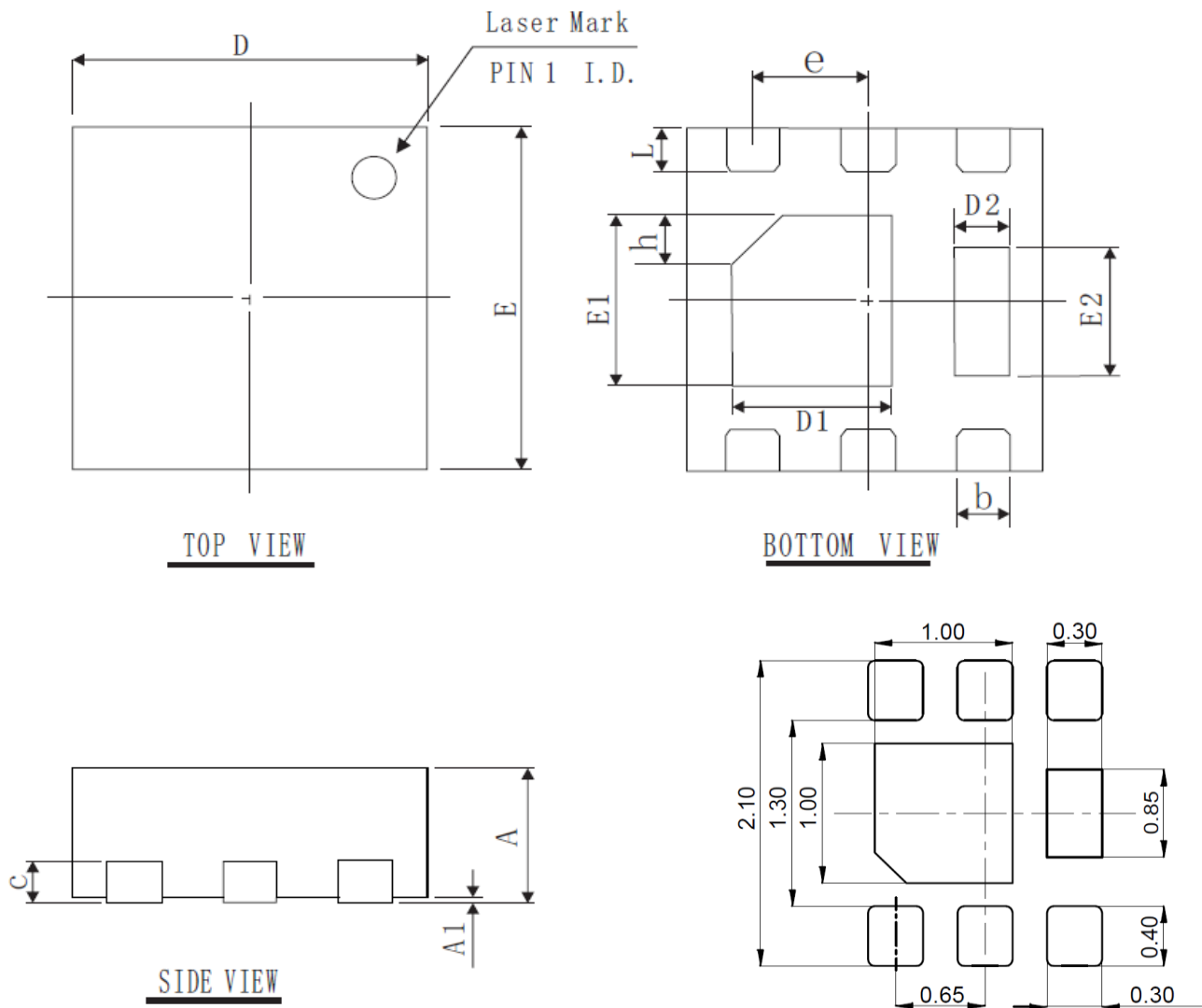
WW =Week.

### Typical Characteristics



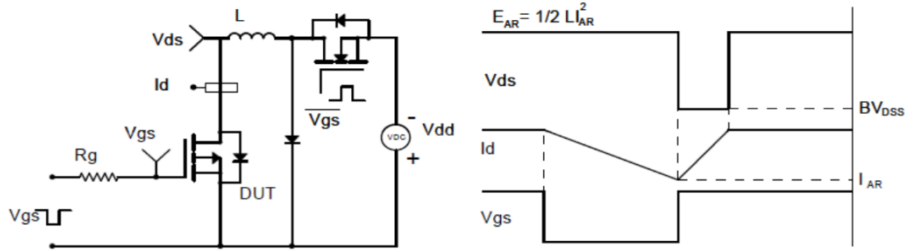
Typical Characteristics



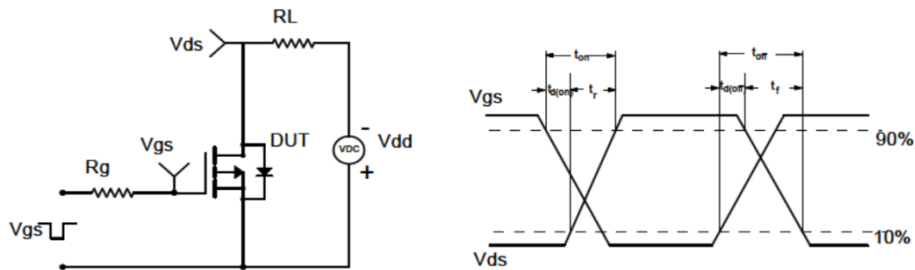
**Package Information**
**SDFN2020B**

 Land Pattern  
(Only for Reference)

SYMBOL	MM			INCH		
	MIN	NOM	MAX	MIN	NOM	MAX
A	0.500	0.550	0.600	0.020	0.022	0.024
A1	0.000	0.020	0.050	0.000	0.001	0.002
b	0.250	0.300	0.350	0.010	0.012	0.014
c	0.152 REF			0.006 REF		
D	1.950	2.000	2.050	0.077	0.079	0.081
D1	0.800	0.900	1.000	0.031	0.035	0.039
D2	0.250	0.300	0.350	0.010	0.012	0.014
E	1.950	2.000	2.050	0.077	0.079	0.081
E1	0.800	0.900	1.000	0.031	0.035	0.039
E2	0.460	0.560	0.660	0.018	0.022	0.026
e	0.65 BSC			0.026 BSC		
h	0.200	0.250	0.300	0.008	0.010	0.012
L	0.250	0.300	0.350	0.010	0.012	0.014

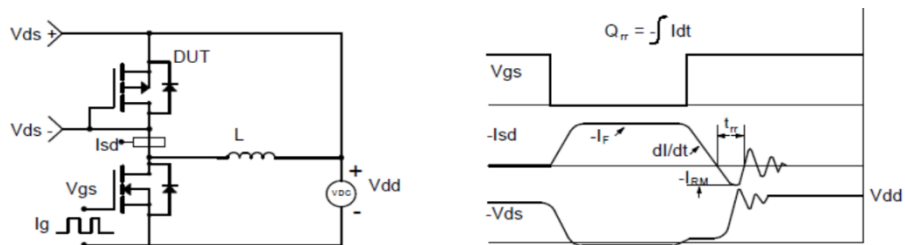
### Avalanche Test Circuit and Waveforms



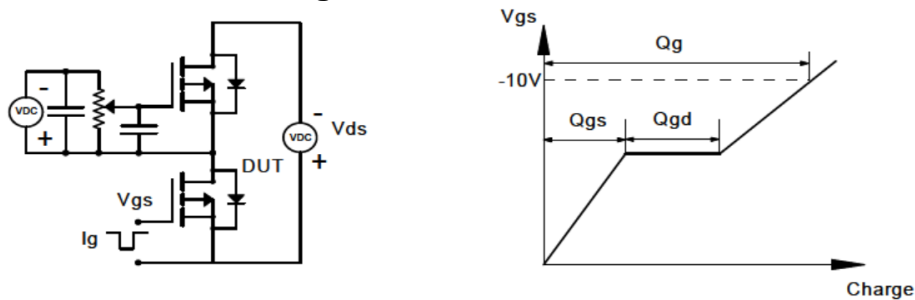
### Switching Time Test Circuit and Waveforms



### Diode Recovery Test Circuit and Waveforms



### Gate Charge Test Circuit and Waveform



### Customer Service

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