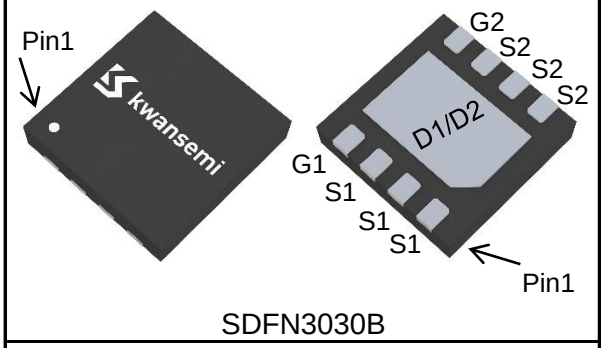
KS2416UA3

Dual N-Channel Advanced Power MOSFET

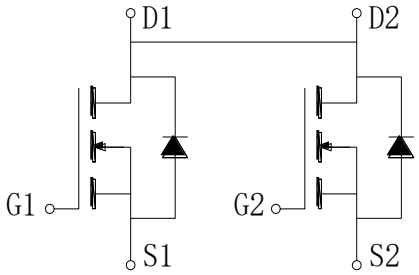
Features

- 20V/55A,
  $R_{DS(ON)}$ =4.9mΩ(Typ.)@V_{GS}=4.5V
  $R_{DS(ON)}$ =5.1mΩ(Typ.)@V_{GS}=3.8V
  $R_{DS(ON)}$ =5.4mΩ(Typ.)@V_{GS}=3.1V
  $R_{DS(ON)}$ =6mΩ(Typ.)@V_{GS}=2.5V
  $R_{DS(ON)}$ =9.5mΩ(Typ.)@V_{GS}=1.8V
- Low $R_{DS(ON)}$
- Super High Dense Cell Design

Pin Description



SDFN3030B



Dual N-Channel MOSFET

Applications

- Power Management
- Battery Protection

RoHS Pb HF Halogen-Free

Absolute Maximum Ratings

Symbol	Parameter		Rating	Unit
Common Ratings (T_C=25°C Unless Otherwise Noted)				
V_{DSS}	Drain-Source Voltage		20	V
V_{GSS}	Gate-Source Voltage		±12	
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	55	A
Mounted on Large Heat Sink				
I_{DP} ①	300μs Pulse Drain Current Tested	T_C=25°C	220	A
I_D ②	Continuous Drain Current@T_C(V_{GS}=4.5V)	T_C=25°C	55	A
		T_C=100°C	35	
	Continuous Drain Current@T_A(V_{GS}=4.5V) ③	T_A=25°C	19	
		T_A=70°C	15	
P_D	Maximum Power Dissipation@T_C	T_C=25°C	30	W
		T_C=100°C	12	
	Maximum Power Dissipation@T_A ③	T_A=25°C	3.6	
		T_A=70°C	2.3	

Symbol	Parameter	Rating	Unit
$R_{\theta JC}$	Thermal Resistance-Junction to Case	4.1	°C/W
$R_{\theta JA}$ ③	Thermal Resistance-Junction to Ambient	35	°C/W
Drain-Source Avalanche Ratings			
E_{AS} ④	Avalanche Energy, Single Pulsed	36	mJ

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

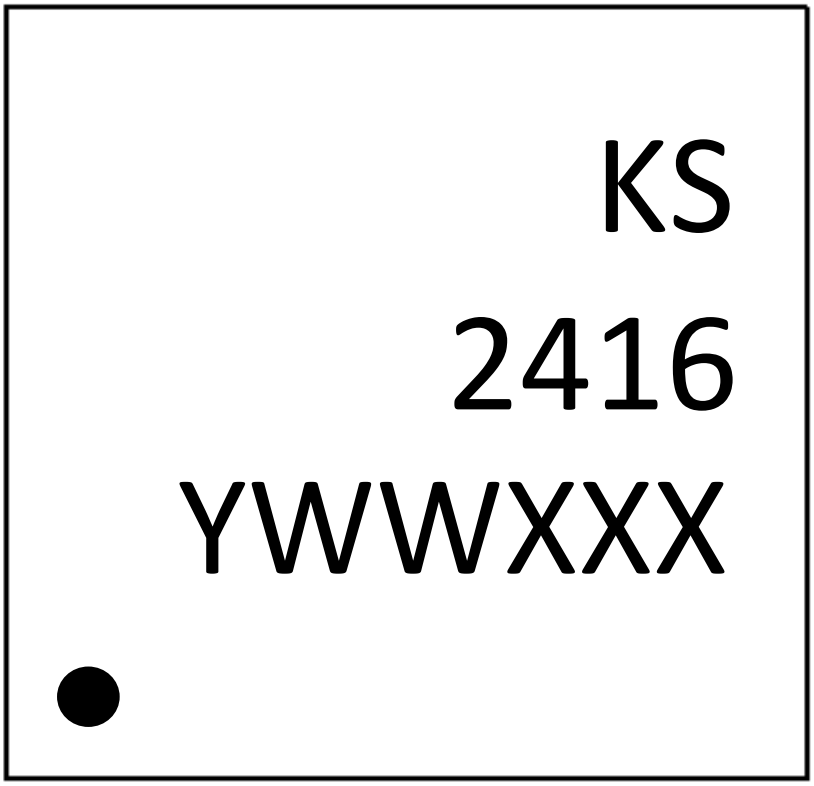
Symbol	Parameter	Test Condition	KS2416UA3			Unit
			Min.	Typ.	Max.	
Static Characteristics						
BV_{DSS}	Drain-Source Breakdown Voltage	V_{GS}=0V, I_{DS}=250μA	20			V
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS}=20V, V_{GS}=0V			1	μA
		T_J=125°C			30	
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS}=V_{GS}, I_{DS}=250μA	0.4	0.7	1	V
I_{GSS}	Gate Leakage Current	V_{GS}=±12V, V_{DS}=0V			±100	nA
$R_{DS(ON)}$ ⑤	Drain-Source On-state Resistance	V_{GS}=4.5V, I_{DS}=3A	3.5	4.9	5.9	mΩ
		V_{GS}=3.8V, I_{DS}=3A	4	5.1	6.2	mΩ
		V_{GS}=3.1V, I_{DS}=3A	4	5.4	6.5	mΩ
		V_{GS}=2.5V, I_{DS}=3A	4.5	6	7.5	mΩ
		V_{GS}=1.8V, I_{DS}=3A	6	9.5	13	mΩ
Diode Characteristics						
V_{SD} ⑤	Diode Forward Voltage	I_{SD}=3A, V_{GS}=0V		0.74	1.2	V
t_{rr}	Reverse Recovery Time	I_{SD}=3A, dI_{SD}/dt=100A/μs		17		ns
Q_{rr}	Reverse Recovery Charge			33		nC
Dynamic Characteristics ⑥						
R_G	Gate Resistance	V_{GS}=0V,V_{DS}=0V,F=1MHz		1.6		Ω
C_{iss}	Input Capacitance	V_{GS}=0V, V_{DS}=10V, Frequency=1.0MHz		1415		pF
C_{oss}	Output Capacitance			230		
C_{rss}	Reverse Transfer Capacitance			150		
$t_{d(ON)}$	Turn-on Delay Time	V_{DD}=10V, I_{DS}=3A, V_{GS}=4,5V,R_G=6Ω		8		ns
t_r	Turn-on Rise Time			12		
$t_{d(OFF)}$	Turn-off Delay Time			23		
t_f	Turn-off Fall Time			14		
Gate Charge Characteristics ⑥						
Q_g	Total Gate Charge	V_{DS}=10V, V_{GS}=4,5V, I_{DS}=3A		19		nC
Q_{gs}	Gate-Source Charge			6.2		
Q_{gd}	Gate-Drain Charge			7.9		

Notes:

①Pulse width limited by safe operating area.
②Calculated continuous current based on maximum allowable junction temperature. The package limitation current is 40A.
③When mounted on 1 inch square copper board, t≤10sec.
④Limited by T_{Jmax}, I_{AS} =12A, L=0.5mH, V_{DD} = 15V, R_G = 25Ω, Starting T_J = 25°C.
⑤Pulse test;Pulse width≤300μs, duty cycle≤2%.
⑥Guaranteed by design, not subject to production testing.

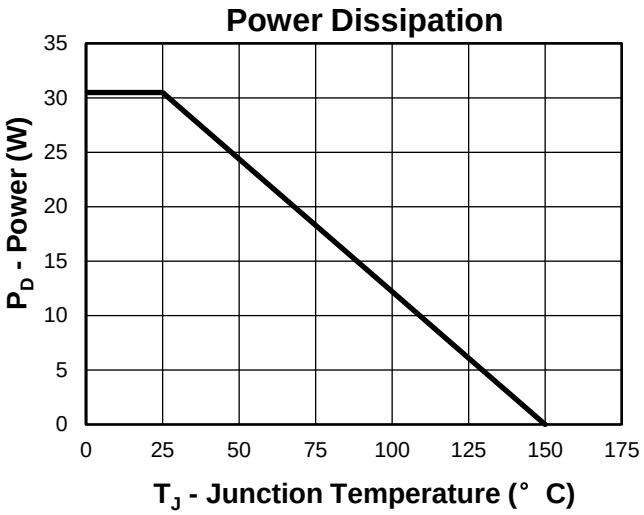
Ordering and Marking Information

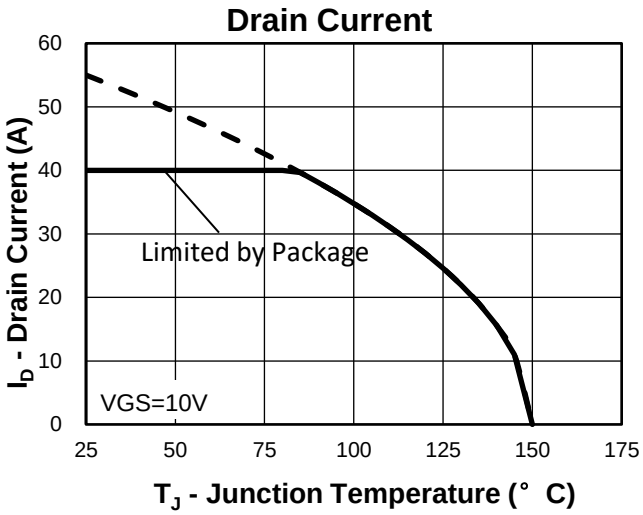
Device	Package	Packaging	Quantity	Reel Size	Tape width
KS2416UA3	SDFN3030B	Tape&Reel	5000	13"	12mm

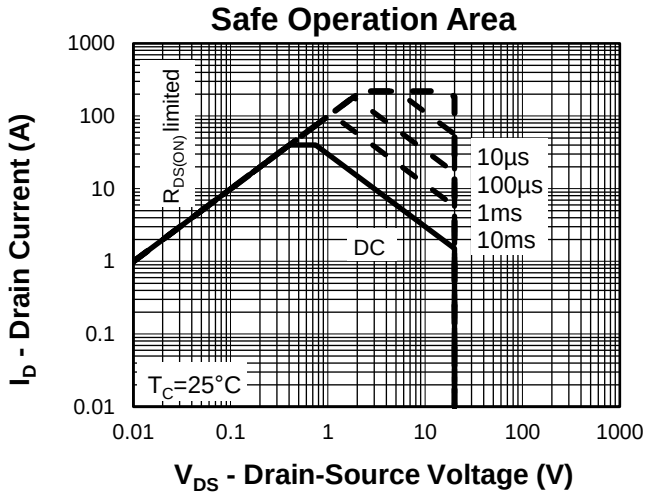


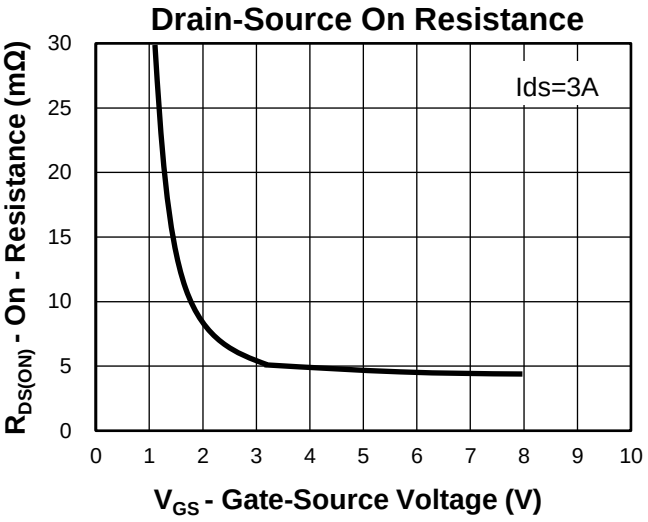
1st Line: Kwansemi Code(KS)
2nd Line: Part Number(2416)
3rd Line: Lot Number(YWWXXX)

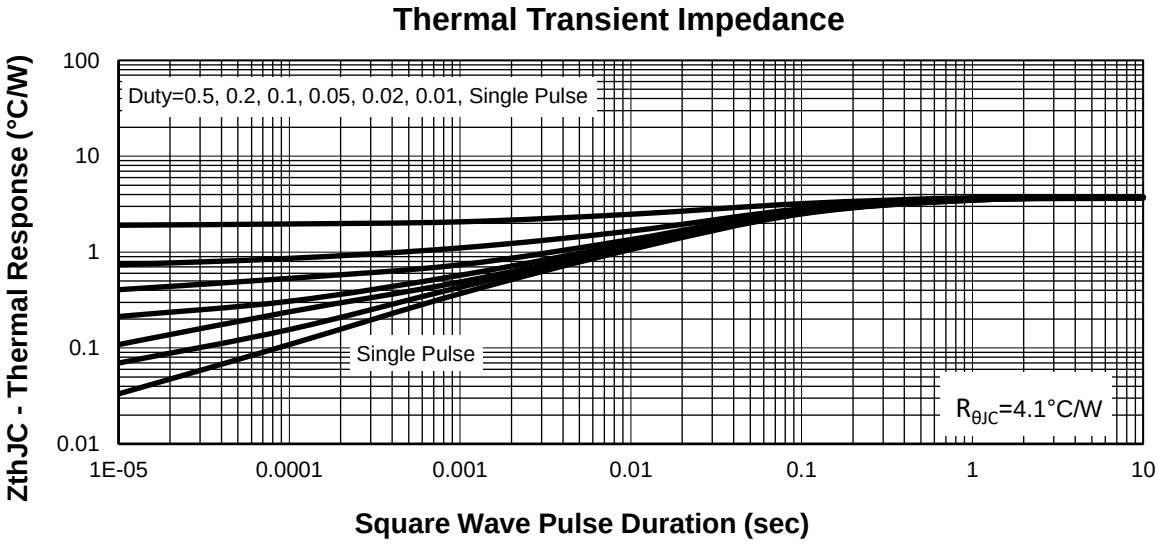
Typical Characteristics











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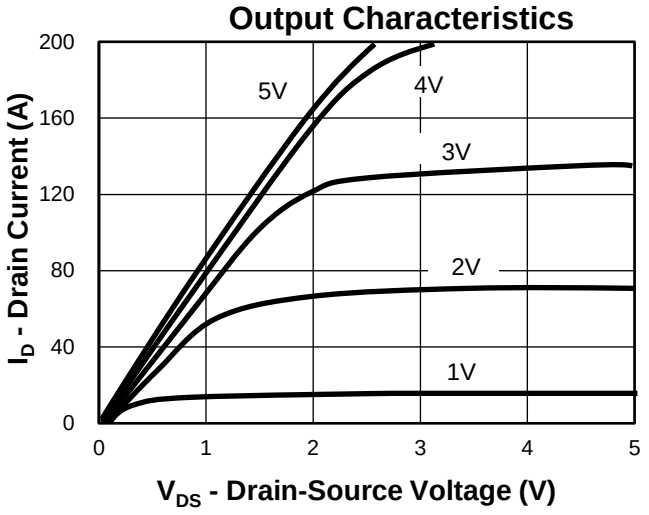
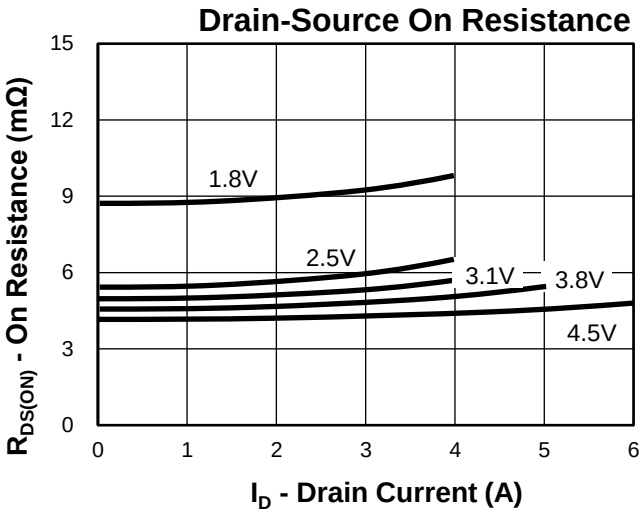
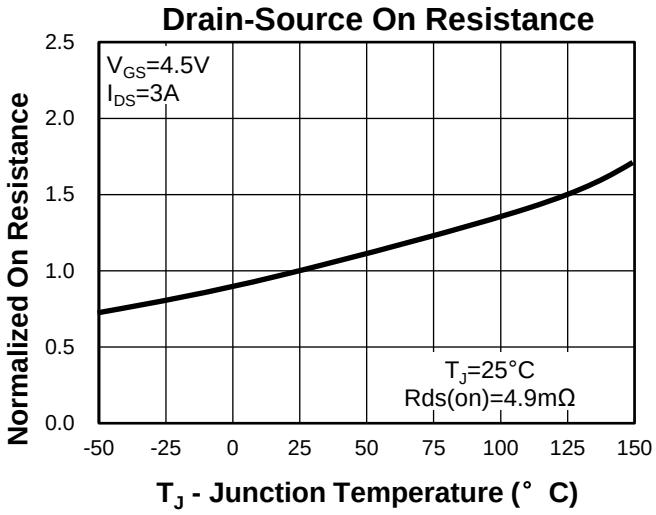
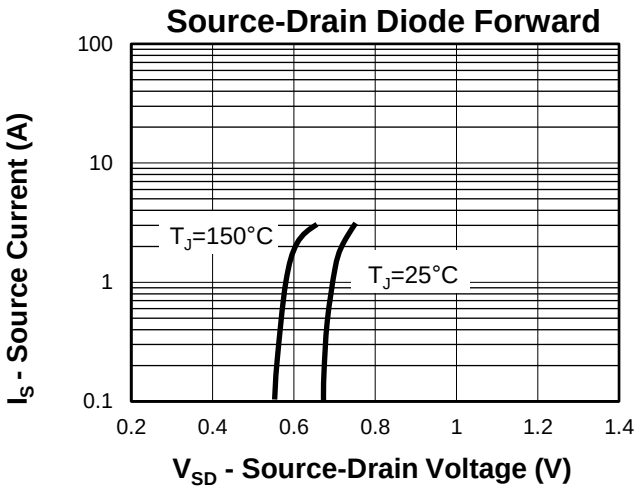
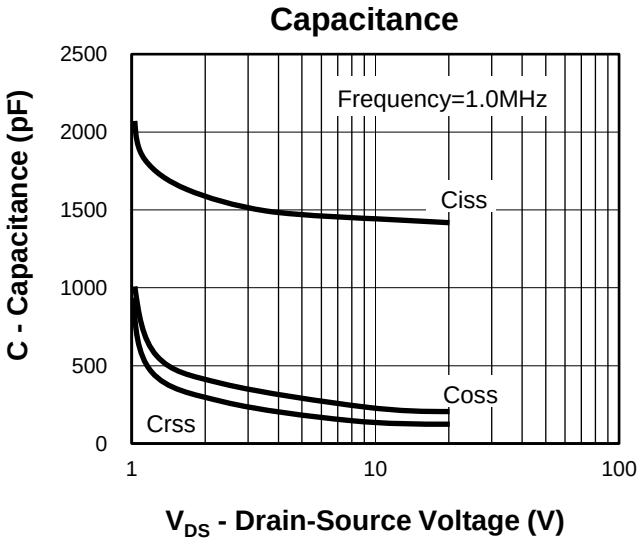
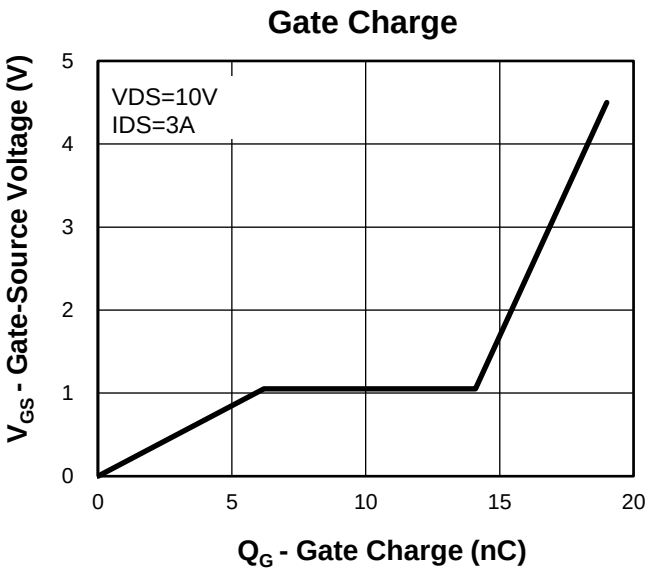






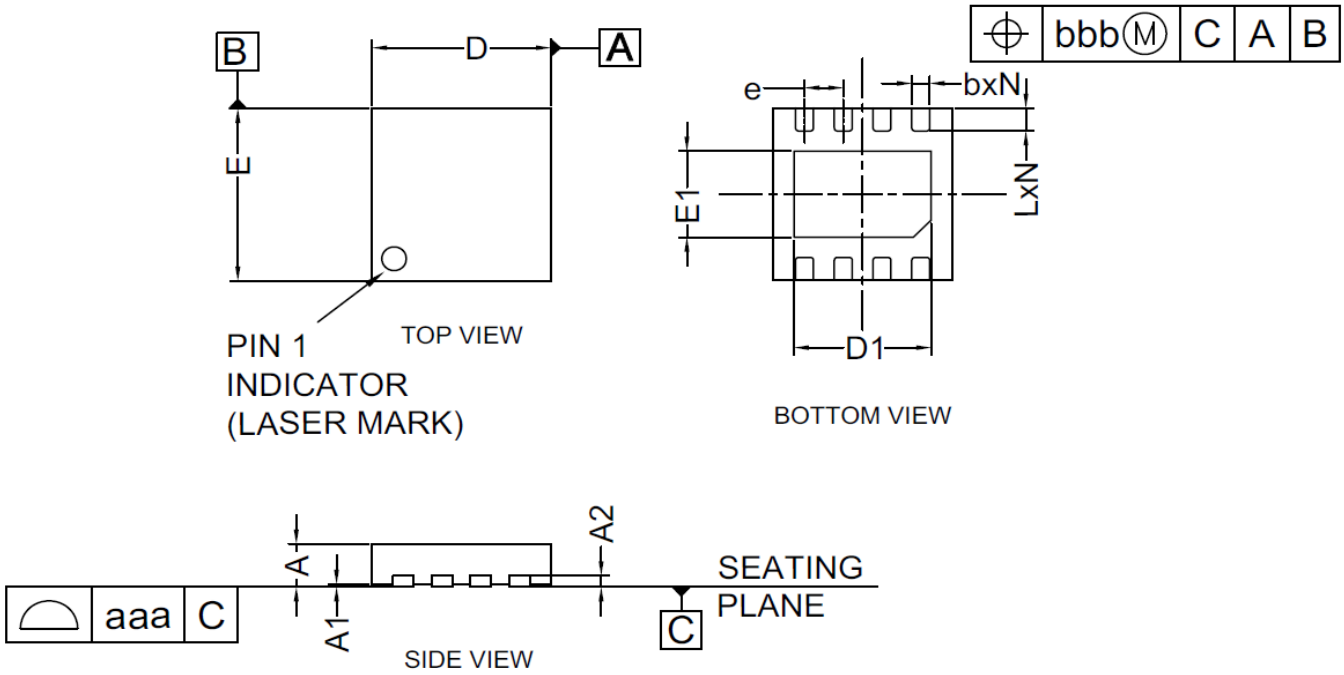






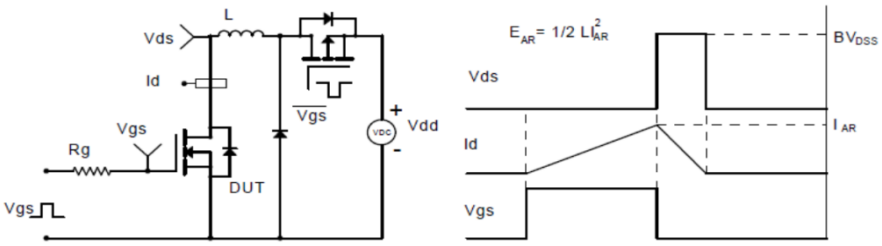
Package Information

SDFN3030B

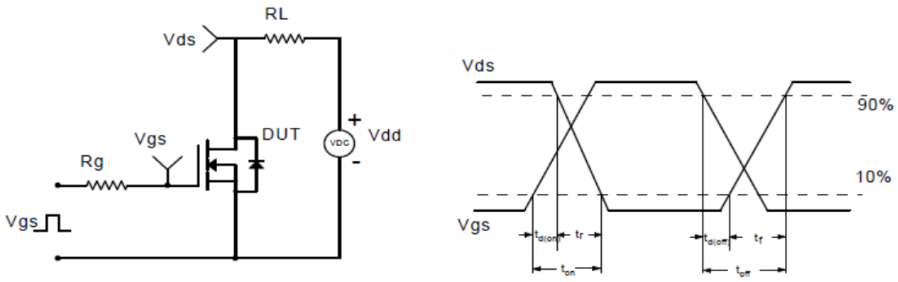


SYMBOL	MM			INCH		
	MIN	NOM	MAX	MIN	NOM	MAX
A	0.70	0.75	0.80	0.028	0.030	0.031
A1	0.00	0.02	0.05	0.000	0.001	0.002
A2		0.203 REF			0.008 REF	
b	0.25	0.30	0.35	0.010	0.012	0.014
D	2.90	3.00	3.10	0.114	0.118	0.122
D1	2.20	2.30	2.40	0.087	0.091	0.094
E	2.90	3.00	3.10	0.114	0.118	0.122
E1	1.40	1.50	1.60	0.055	0.059	0.063
e		0.65 BSC			0.026 BSC	
L	0.35	0.40	0.45	0.014	0.016	0.018
K	0.20	-	-	0.008	-	-
aaa		0.08 REF			0.003 REF	
bbb		0.10 REF			0.004 REF	

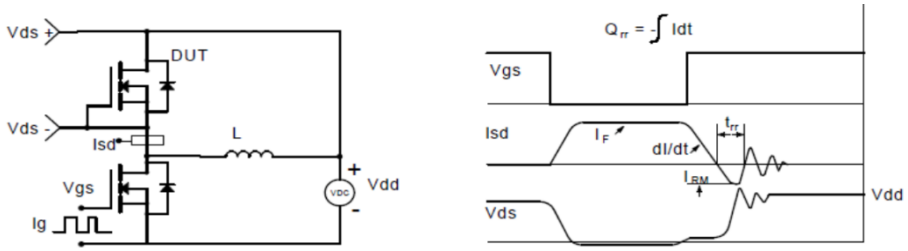
Avalanche Test Circuit and Waveforms



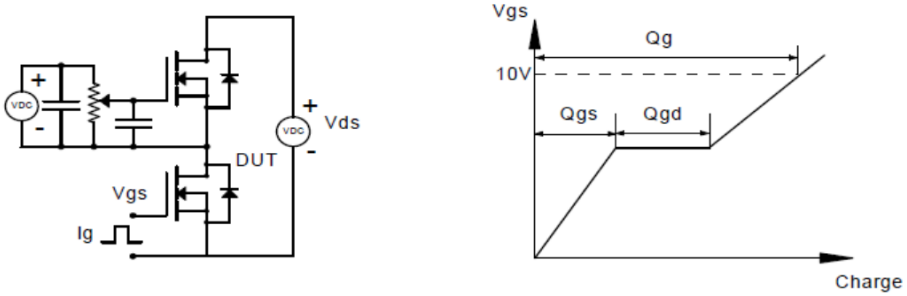
Switching Time Test Circuit and Waveforms



Diode Recovery Test Circuit and Waveforms



Gate Charge Test Circuit and Waveform



Customer Service

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