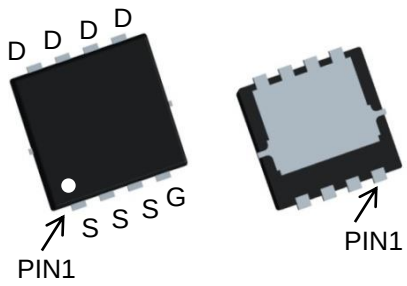
KSA202NAT

Single N-Channel Advanced Power MOSFET

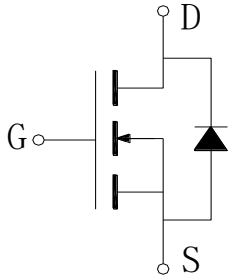
Features

- 120V/90A,
  $R_{DS(ON)}$ =6.5mΩ(Typ.)@V_{GS}=10V
  $R_{DS(ON)}$ =8mΩ(Typ.)@V_{GS}=4.5V
- Excellent Q_G x $R_{DS(on)}$ product(FOM)
- SGT Technology
- 100% avalanche tested

Pin Description



PDFN5060



Single N-Channel MOSFET

Applications

- USB-PD Adaptors
- Synchronous Rectification

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		120	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	90	A
Mounted on Large Heat Sink				
I_{DP} ①	300μs Pulse Drain Current Tested	T_C=25°C	360	A
I_D ②	Continuous Drain Current@T_C(V_{GS}=10V)	T_C=25°C	90	A
		T_C=100°C	57	
	Continuous Drain Current@T_A(V_{GS}=10V) ③	T_A=25°C	16	
		T_A=70°C	13	
P_D	Maximum Power Dissipation@T_C	T_C=25°C	125	W
		T_C=100°C	50	
	Maximum Power Dissipation@T_A ③	T_A=25°C	4.2	
		T_A=70°C	2.7	

Symbol	Parameter	Rating	Unit
$R_{\theta JC}$	Thermal Resistance-Junction to Case	1	°C/W
$R_{\theta JA}$ ③	Thermal Resistance-Junction to Ambient	30	°C/W
Drain-Source Avalanche Ratings			
E_{AS} ④	Avalanche Energy, Single Pulsed	100	mJ

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

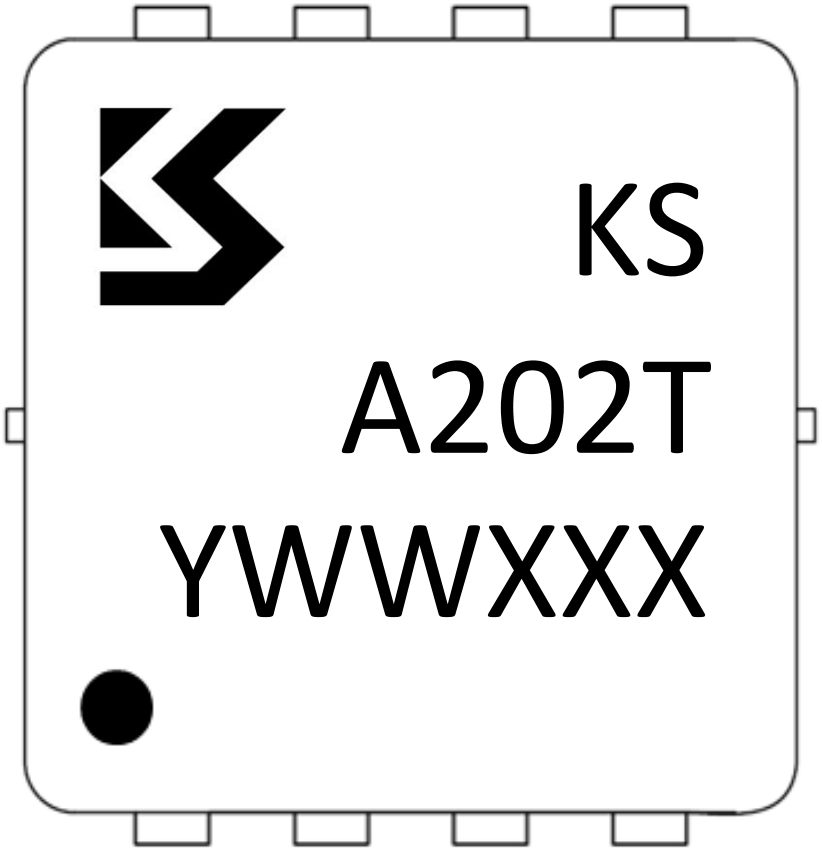
Symbol	Parameter	Test Condition	KSA202NAT			Unit
			Min.	Typ.	Max.	
Static Characteristics						
BV_{DSS}	Drain-Source Breakdown Voltage	V_{GS}=0V, I_{DS}=250μA	120			V
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS}=120V, V_{GS}=0V			1	μA
		T_J=125°C			30	
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS}=V_{GS}, I_{DS}=250μA	1.4	2	2.4	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		6.5	8	mΩ
		V_{GS}=4.5V, I_{DS}=15A		8	9.5	mΩ
Diode Characteristics						
V_{SD} ⑤	Diode Forward Voltage	I_{SD}=20A, V_{GS}=0V		0.81	1.2	V
t_{rr}	Reverse Recovery Time	I_{SD}=20A, dI_{SD}/dt=100A/μs		55		ns
Q_{rr}	Reverse Recovery Charge			68		nC
Dynamic Characteristics ⑥						
R_G	Gate Resistance	V_{GS}=0V,V_{DS}=0V,F=1MHz		1.2		Ω
C_{iss}	Input Capacitance	V_{GS}=0V, V_{DS}=60V, Frequency=1.0MHz		3950		pF
C_{oss}	Output Capacitance			1365		
C_{rss}	Reverse Transfer Capacitance			20		
$t_{d(ON)}$	Turn-on Delay Time	V_{DD}=60V, I_{DS}=20A, V_{GS}=10V,R_G=3Ω		12		ns
t_r	Turn-on Rise Time			41		
$t_{d(OFF)}$	Turn-off Delay Time			31		
t_f	Turn-off Fall Time			38		
Gate Charge Characteristics ⑥						
Q_g	Total Gate Charge	V_{DS}=60V, V_{GS}=10V, I_{DS}=20A		54		nC
Q_{gs}	Gate-Source Charge			13		
Q_{gd}	Gate-Drain Charge			7		

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≤10sec.
④Limited by T_{Jmax}, I_{AS} =20A, L=0.5mH, V_{DD} = 48V, R_G = 25Ω, Starting T_J = 25°C.
⑤Pulse test;Pulse width≤300μs, duty cycle≤2%.
⑥Guaranteed by design, not subject to production testing.

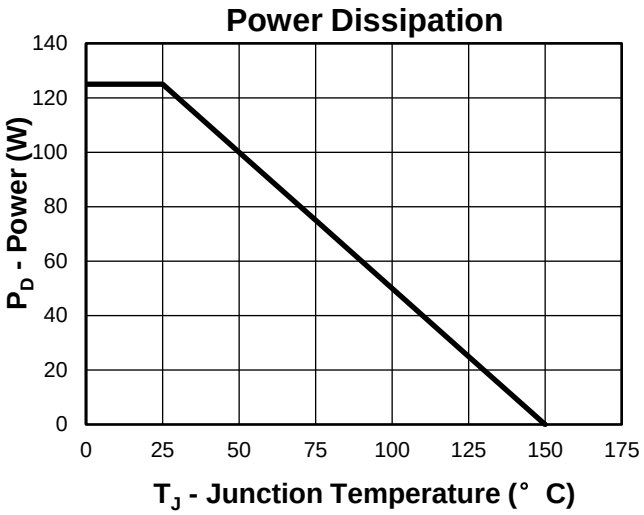
Ordering and Marking Information

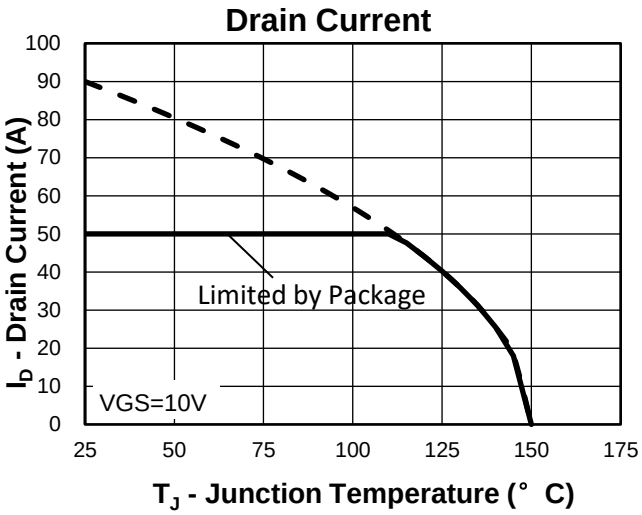
Device	Package	Packaging	Quantity	Reel Size	Tape width
KSA202NAT	PDFN5060	Tape&Reel	5000	13"	12mm

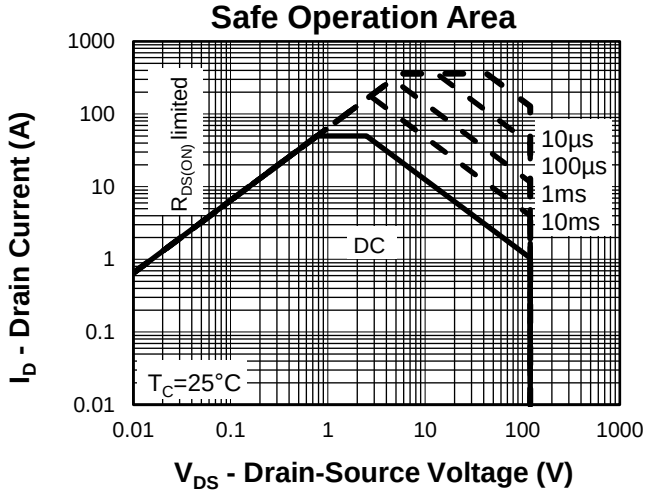


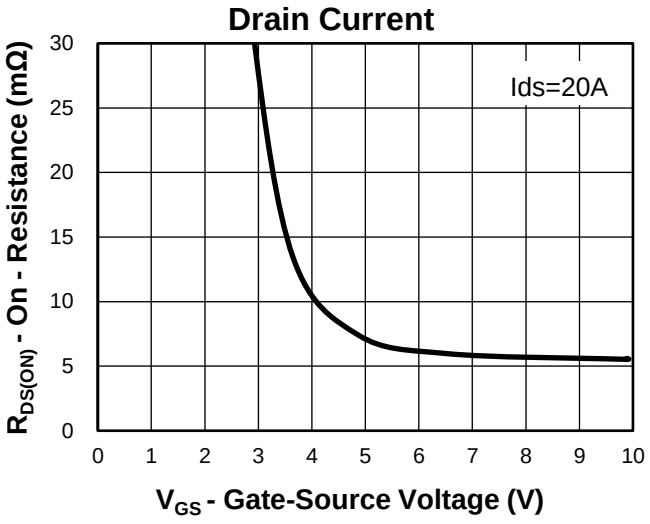
Y =Year,2017-A,2018-B,etc.
WW =Week.
XXX =Lot number.

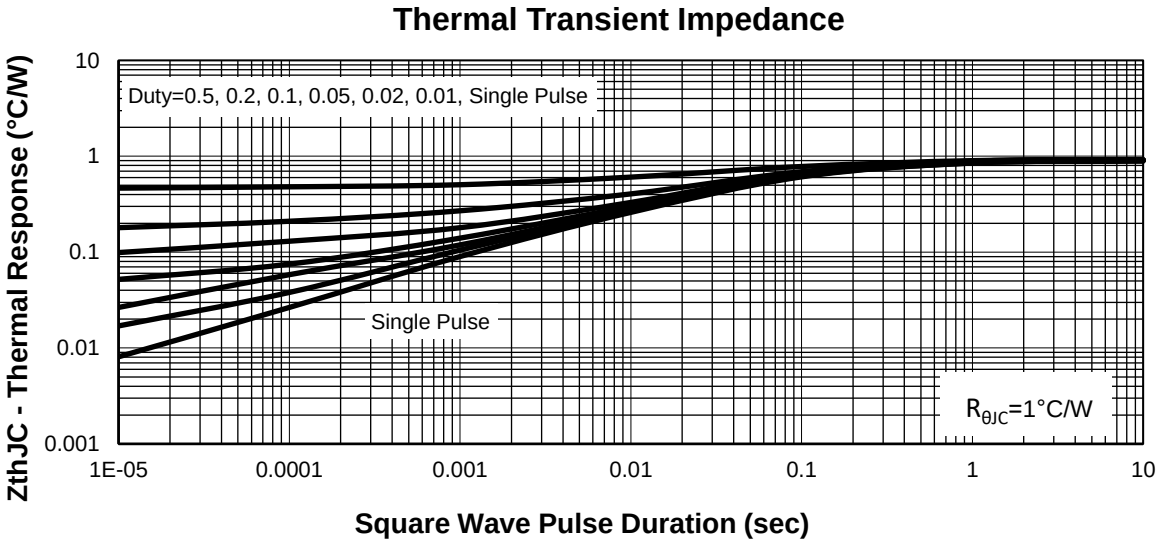
Typical Characteristics





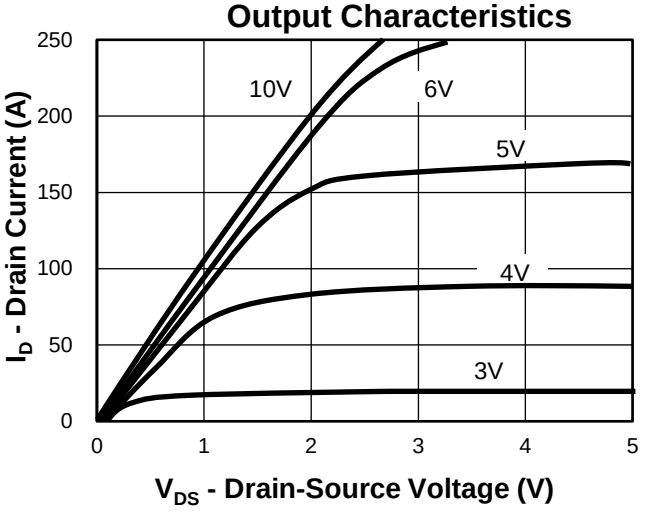




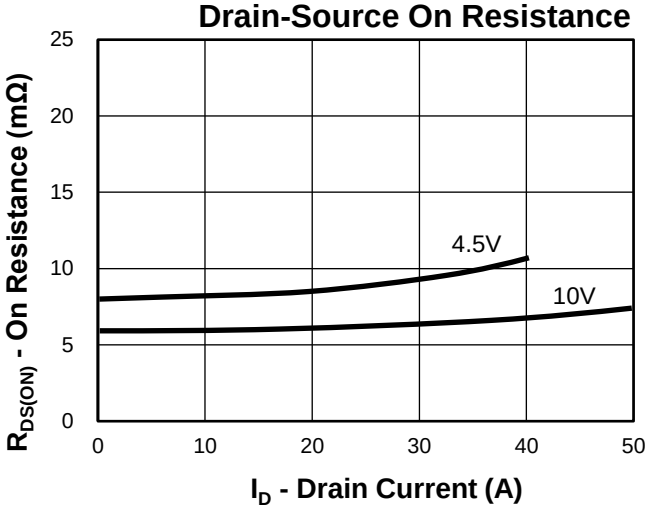


Typical Characteristics

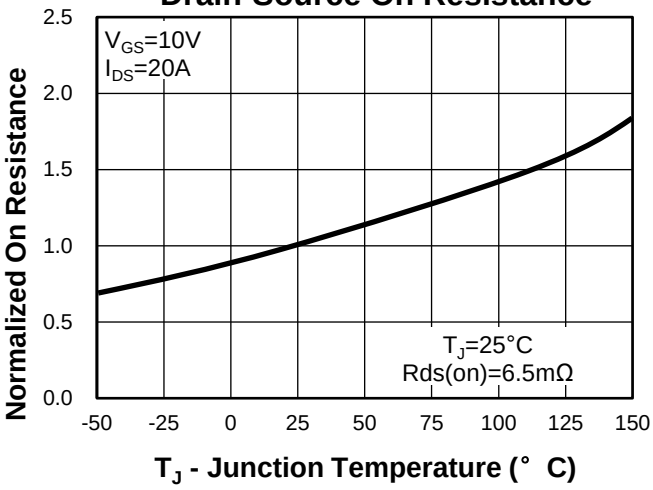
Output Characteristics



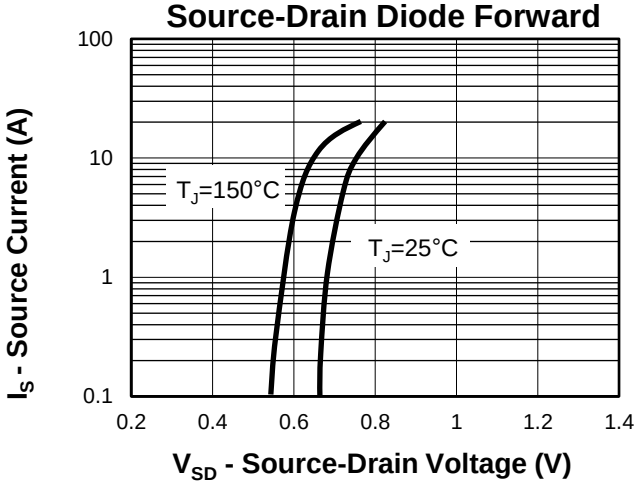
Drain-Source On Resistance



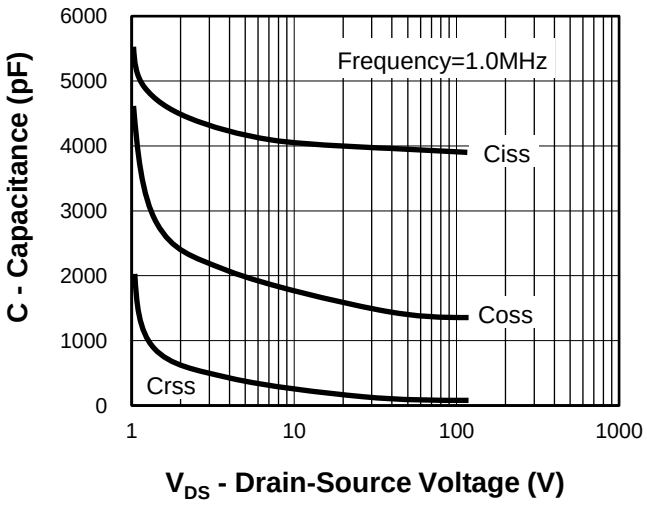
Drain-Source On Resistance



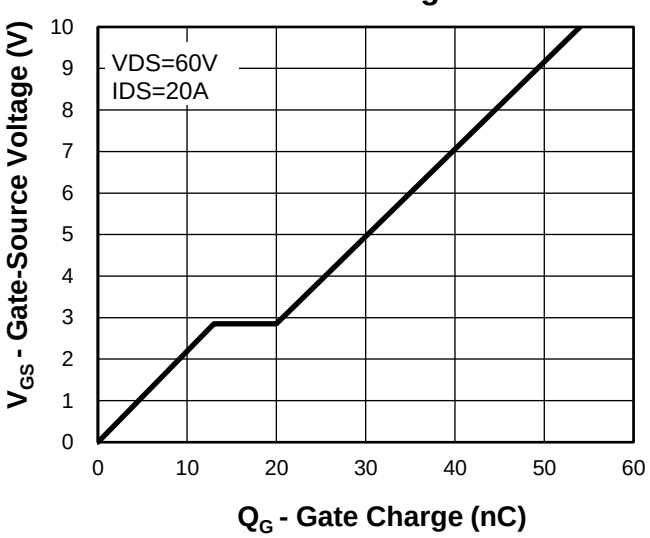
Source-Drain Diode Forward



Capacitance

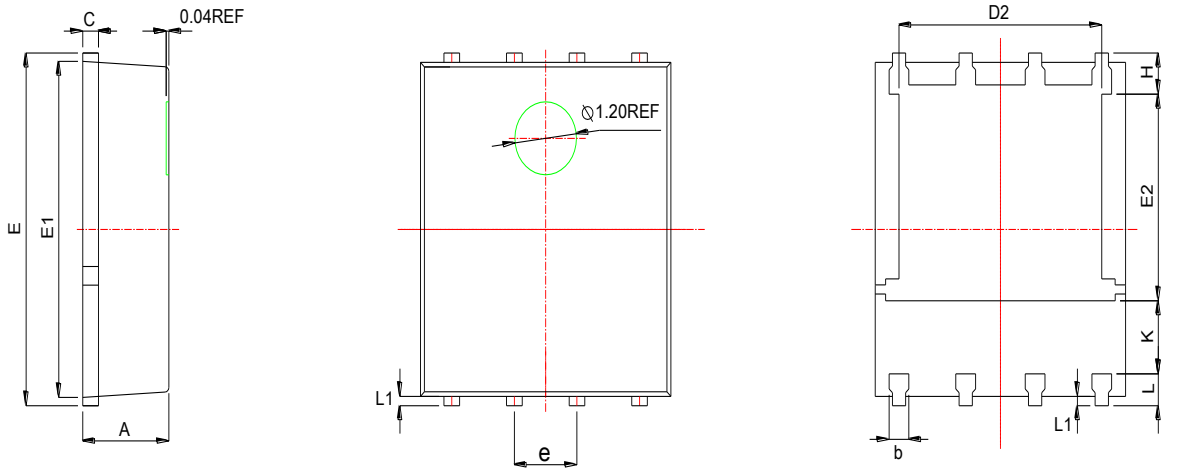


Gate Charge

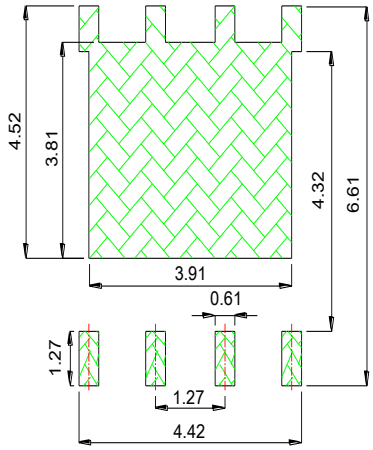


Package Information

PDFN5060

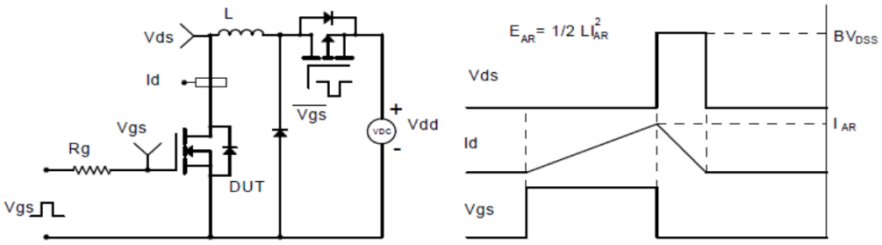


Land Pattern
(Only for Reference)

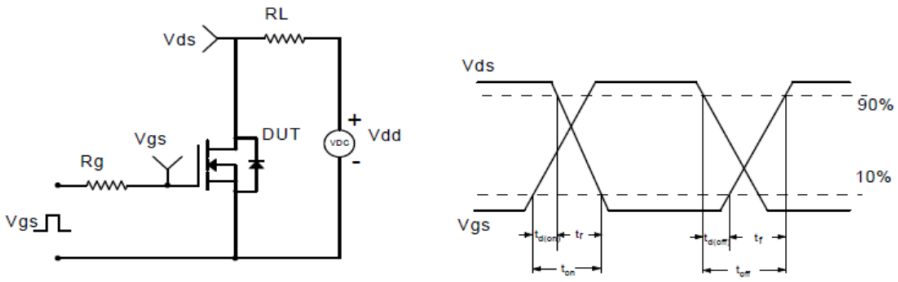


SYMBOL	MM			INCH		
	MIN	NOM	MAX	MIN	NOM	MAX
A	0.90	1.00	1.10	0.035	0.039	0.043
b	0.33	0.42	0.51	0.013	0.017	0.020
c	0.20	0.25	0.30	0.008	0.010	0.012
D1	4.80	4.90	5.00	0.189	0.193	0.197
D2	3.61	3.79	3.96	0.142	0.149	0.156
E	5.90	6.00	6.10	0.232	0.236	0.240
E1	5.65	5.75	5.85	0.222	0.226	0.230
E2	3.38	3.58	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°

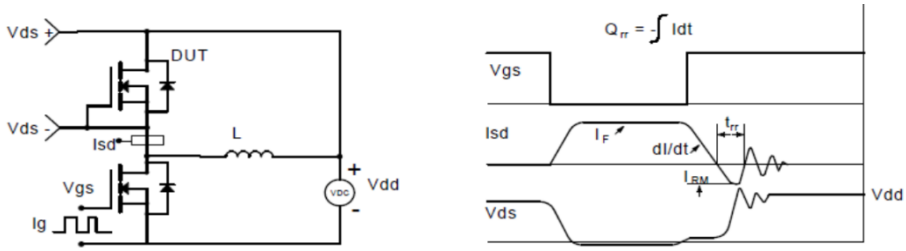
Avalanche Test Circuit and Waveforms



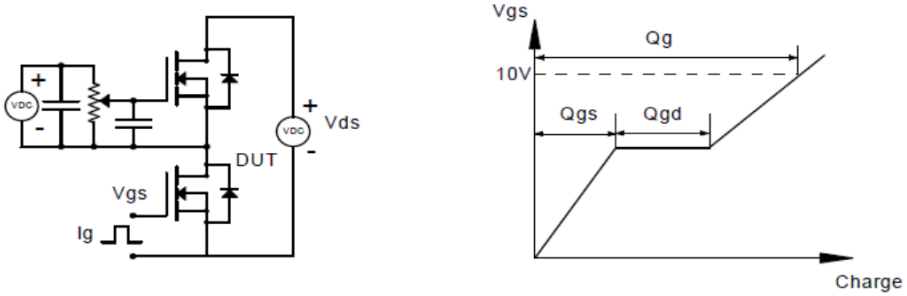
Switching Time Test Circuit and Waveforms



Diode Recovery Test Circuit and Waveforms



Gate Charge Test Circuit and Waveform



Customer Service

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