

Features

- 40V/68A,
 $R_{DS(ON)} = 3.5m\Omega(Typ.)@V_{GS}=10V$
 $R_{DS(ON)} = 4.7m\Omega(Typ.)@V_{GS}=4.5V$
- Excellent $Q_G \times R_{DS(on)}$ product(FOM)
- SGT Technology
- High Ruggedness
- 100% Avalanche Tested

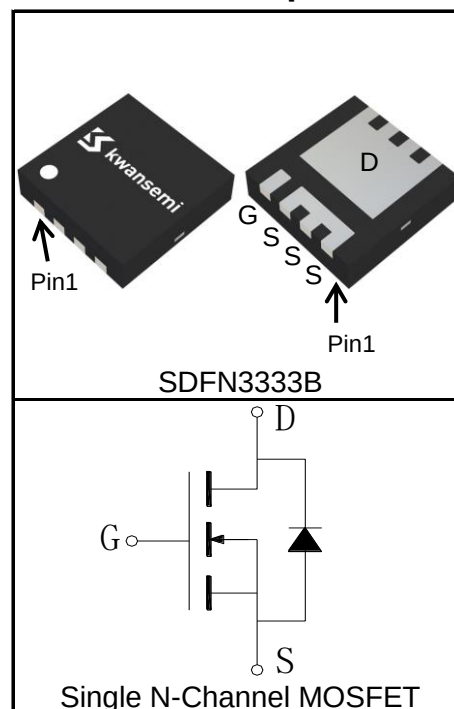
Applications

- High Frequency Switching and Synchronous Rectification
- 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_{Jmax}	Maximum Junction Temperature	150	$^\circ\text{C}$
T_J, T_{STG}	Operating and Storage Temperature Range	-55 to 150	$^\circ\text{C}$
I_S	Diode Continuous Forward Current	$T_C=25^\circ\text{C}$ 68	A
Mounted on Large Heat Sink			
$I_{DP}^{①}$	Pulse Drain Current	$T_C=25^\circ\text{C}$ 272	A
$I_D^{②}$	Continuous Drain Current@ $T_C(V_{GS}=10V)$	$T_C=25^\circ\text{C}$ 68	A
		$T_C=100^\circ\text{C}$ 43	
	Continuous Drain Current@ $T_A(V_{GS}=10V)^{③}$	$T_A=25^\circ\text{C}$ 22	
		$T_A=70^\circ\text{C}$ 18	
P_D	Maximum Power Dissipation@ T_C	$T_C=25^\circ\text{C}$ 31	W
		$T_C=100^\circ\text{C}$ 12	
	Maximum Power Dissipation@ $T_A^{③}$	$T_A=25^\circ\text{C}$ 3.5	
		$T_A=70^\circ\text{C}$ 2.3	

Symbol	Parameter	Rating	Unit
$R_{\theta JC}$	Thermal Resistance-Junction to Case	3.95	°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	100	mJ

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

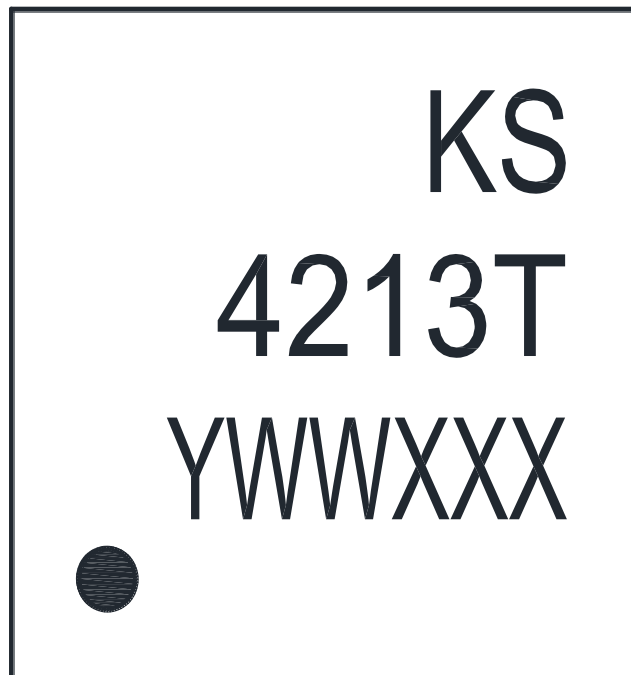
Symbol	Parameter	Test Condition	Rating			Unit
			Min.	Typ.	Max.	
Static Characteristics						
BV _{DSS}	Drain-Source Breakdown Voltage	V _{GS} =0V, I _{DS} =250μA	40			V
I _{DSS}	Zero Gate Voltage Drain Current	V _{DS} =40V, V _{GS} =0V			1	μA
		T _J =125°C			30	
V _{GS(th)}	Gate Threshold Voltage	V _{DS} =V _{GS} , I _{DS} =250μA	1.1	1.7	2.3	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		3.5	4.2	mΩ
		V _{GS} =4.5V, I _{DS} =15A		4.7	6.2	mΩ
Diode Characteristics						
V _{SD} ^⑤	Diode Forward Voltage	I _{SD} =20A, V _{GS} =0V		0.83	1.2	V
t _{rr}	Reverse Recovery Time	I _{SD} =20A, dI _{SD} /dt=100A/μs		14		ns
Q _{rr}	Reverse Recovery Charge			31		nC
Dynamic Characteristics ^⑥						
R _G	Gate Resistance	V _{GS} =0V, V _{DS} =0V, F=1MHz		3.6		Ω
C _{iss}	Input Capacitance	V _{GS} =0V, V _{DS} =20V, Frequency=1.0MHz		1190		pF
C _{oss}	Output Capacitance			280		
C _{rss}	Reverse Transfer Capacitance			15		
t _{d(ON)}	Turn-on Delay Time	V _{DD} =20V, I _{DS} =20A, V _{GS} =10V, R _G =3Ω		9		ns
t _r	Turn-on Rise Time			19		
t _{d(OFF)}	Turn-off Delay Time			37		
t _f	Turn-off Fall Time			12		
Gate Charge Characteristics ^⑥						
Q _g	Total Gate Charge	V _{DS} =20V, V _{GS} =10V, I _{DS} =20A		18		nC
Q _{gs}	Gate-Source Charge			3.5		
Q _{gd}	Gate-Drain Charge			2.3		

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, $t \leq 10\text{sec}$.
- ④Limited by $T_{j\text{max}}$, Starting $T_j = 25^\circ\text{C}$, $I_{AS\text{max}} = 20\text{A}$, $L = 0.5\text{mH}$, $V_{DD} = 24\text{V}$, $R_G = 25\Omega$, $V_{GS} = 10\text{V}$. Part not recommended for use above this value. 100% Final Test at $I_{AS} = 10\text{A}$, $L = 0.5\text{mH}$.
- ⑤Pulse test; Pulse width $\leq 300\mu\text{s}$, duty cycle $\leq 2\%$.
- ⑥Guaranteed by design, not subject to production testing.

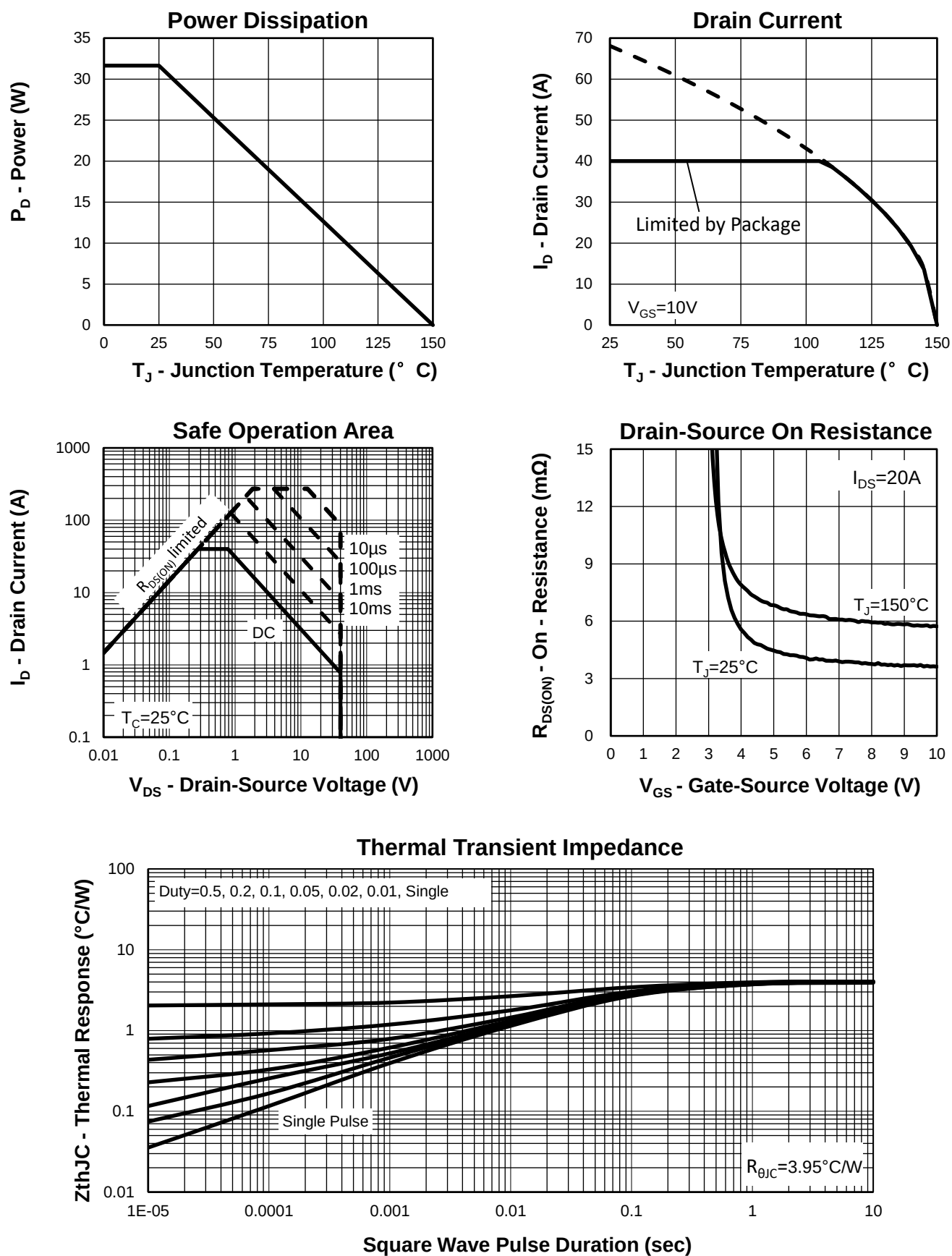
Ordering and Marking Information

Device	Package	Packaging	Quantity	Reel Size	Tape width
KS4213UU3T	SDFN3333B	Tape&Reel	5000	13"	12mm

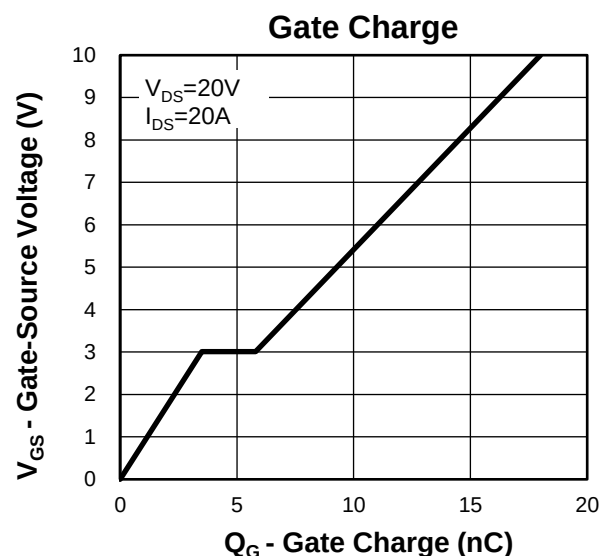
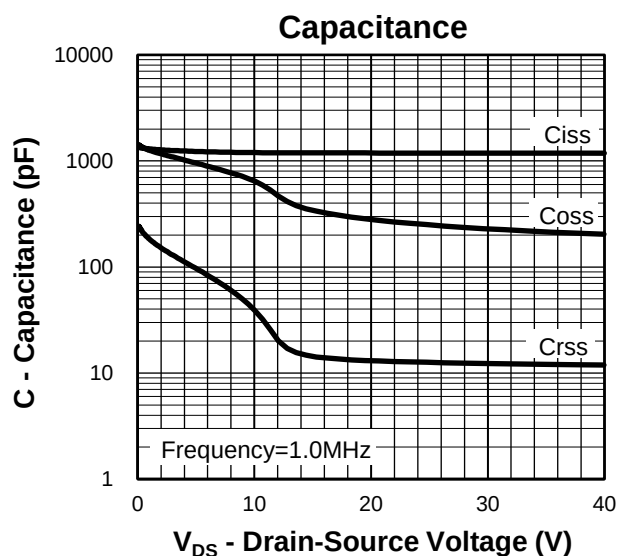
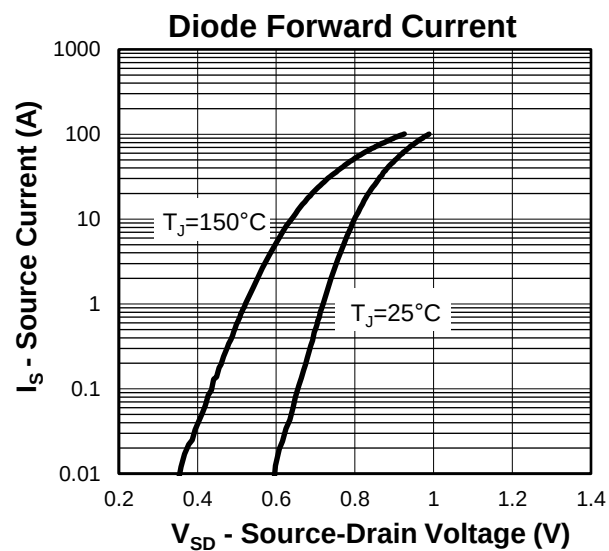
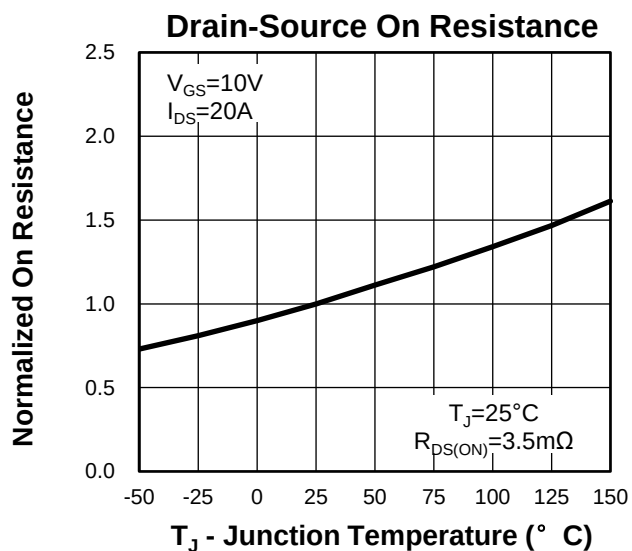
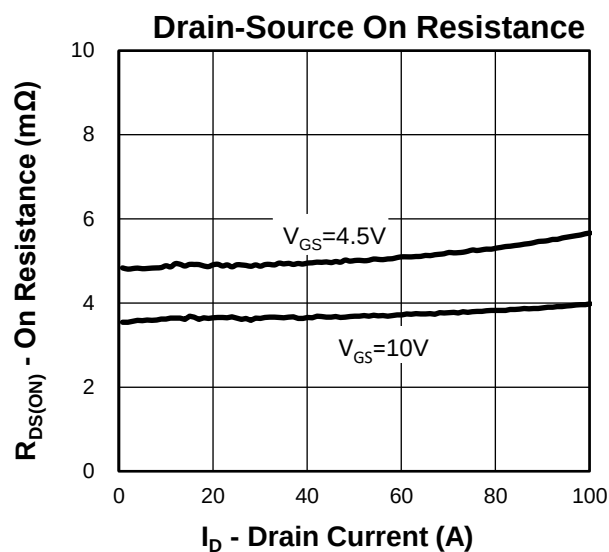
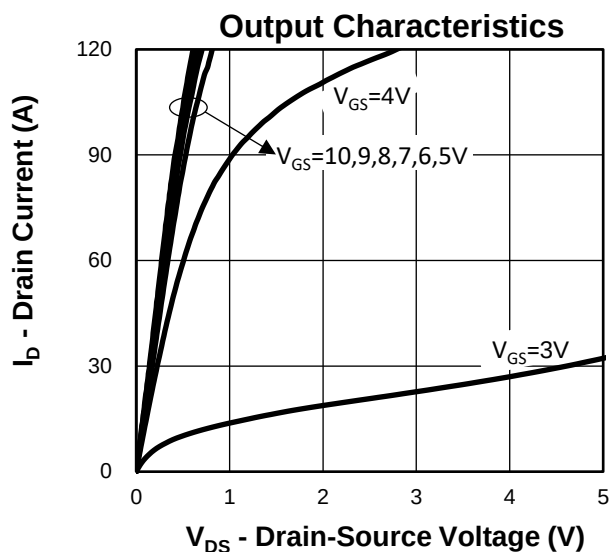


1st Line: Kwansemi Code(KS)
 2nd Line: Part Number(4213T)
 3rd Line: Lot Number(YWWXXX)

Typical Characteristics

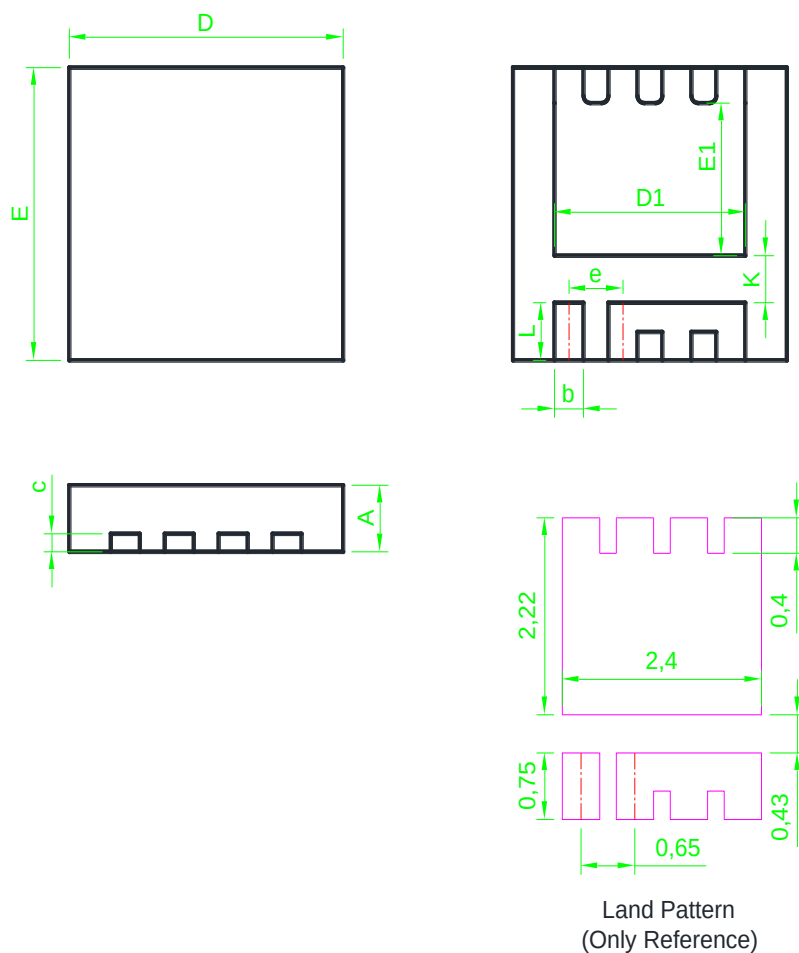


Typical Characteristics



Package Information

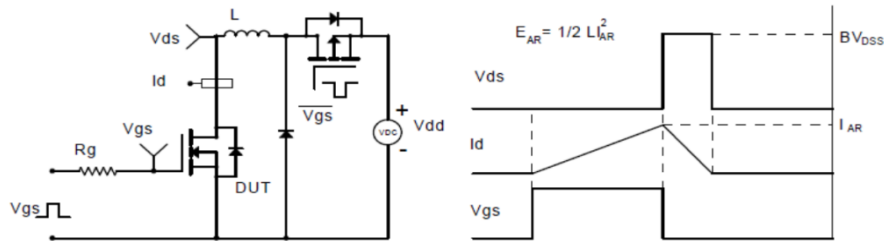
SDFN3333B



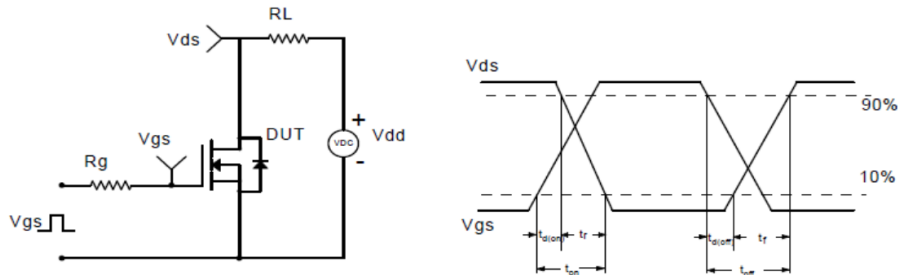
SYMBOL	MM			INCH		
	MIN	NOM	MAX	MIN	NOM	MAX
A	0.70	0.75	0.80	0.028	0.030	0.031
b	0.30	0.35	0.40	0.012	0.014	0.016
c	0.15	0.20	0.25	0.006	0.008	0.010
D	3.20	3.30	3.40	0.126	0.130	0.134
D1	2.20	2.30	2.40	0.087	0.091	0.094
e	0.60	0.65	0.70	0.024	0.026	0.028
E	3.20	3.30	3.40	0.126	0.130	0.134
E1	1.62	1.72	1.82	0.064	0.068	0.072
L	0.55	0.65	0.75	0.022	0.026	0.030
K	0.43	0.53	0.63	0.017	0.021	0.025

Note: Dimensions do not inclusive burrs and mold flash.

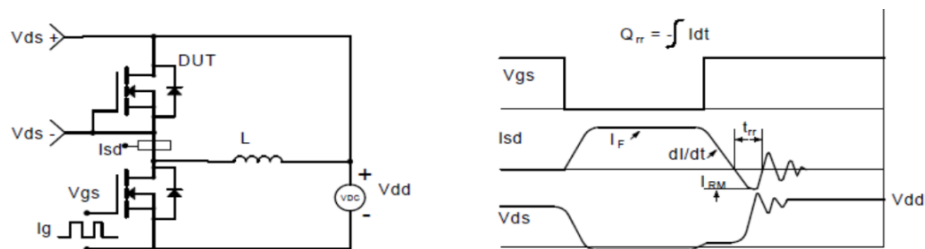
Avalanche Test Circuit and Waveforms



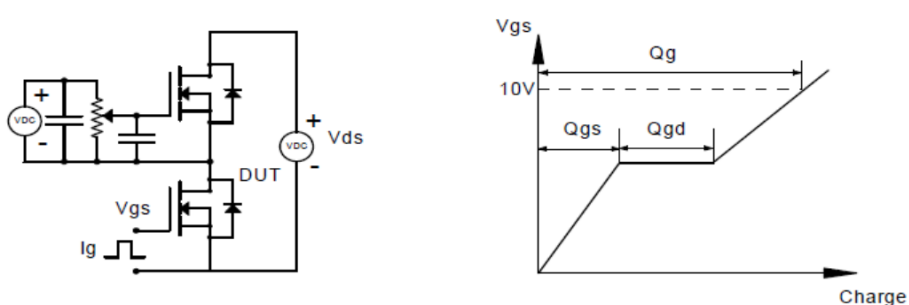
Switching Time Test Circuit and Waveforms



Diode Recovery Test Circuit and Waveforms



Gate Charge Test Circuit and Waveform



Customer Service

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