

Features

- 40V/490A,
 $R_{DS(ON)} = 0.7m\Omega(Typ.)@V_{GS}=10V$
 $R_{DS(ON)} = 1.2m\Omega(Typ.)@V_{GS}=4.5V$
- Excellent $Q_G \times R_{DS(on)}$ product(FOM)
- SGT Technology
- 100% Avalanche Tested
- High Current Capability
- Good Thermal Performance

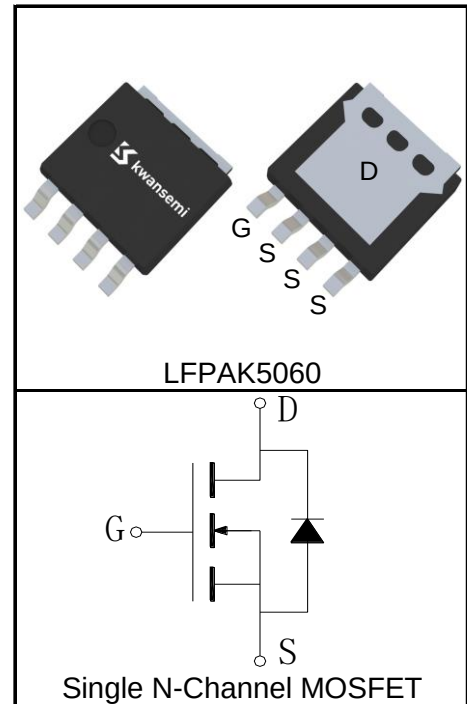
Applications

- DC/DC Converter
- High Frequency Switching and Synchronous Rectification



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	V
T_{Jmax}	Maximum Junction Temperature	175	$^\circ\text{C}$
T_J, T_{STG}	Operating and Storage Temperature Range	-55 to 175	$^\circ\text{C}$
I_S	Diode Continuous Forward Current	$T_C=25^\circ\text{C}$ 490	A
Mounted on Large Heat Sink			
$I_{DP}^{①}$	Pulse Drain Current	$T_C=25^\circ\text{C}$ 1960	A
$I_D^{②}$	Continuous Drain Current@ $T_C(V_{GS}=10V)$	$T_C=25^\circ\text{C}$ 490	A
		$T_C=100^\circ\text{C}$ 346	
	Continuous Drain Current@ $T_A(V_{GS}=10V)^{③}$	$T_A=25^\circ\text{C}$ 48	
		$T_A=70^\circ\text{C}$ 40	
P_D	Maximum Power Dissipation@ T_C	$T_C=25^\circ\text{C}$ 375	W
		$T_C=100^\circ\text{C}$ 187	
	Maximum Power Dissipation@ $T_A^{③}$	$T_A=25^\circ\text{C}$ 3.6	
		$T_A=70^\circ\text{C}$ 2.5	

Symbol	Parameter	Rating	Unit
$R_{\theta JC}$	Thermal Resistance-Junction to Case	0.4	°C/W
$R_{\theta JA}^{③}$	Thermal Resistance-Junction to Ambient	42	°C/W
Drain-Source Avalanche Ratings			
$E_{AS}^{④}$	Avalanche Energy, Single Pulsed	870	mJ

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

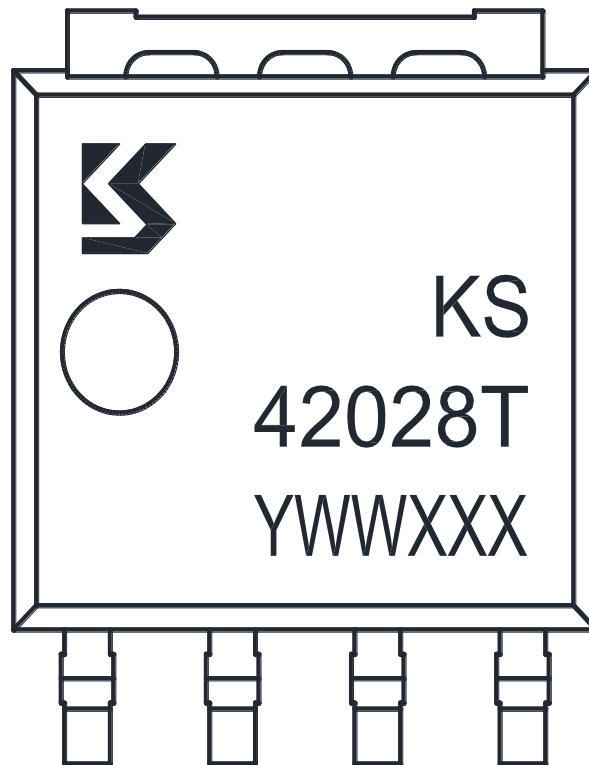
Symbol	Parameter	Test Condition	Rating			Unit
			Min.	Typ.	Max.	
Static Characteristics						
BV _{DSS}	Drain-Source Breakdown Voltage	V _{GS} =0V, I _{DS} =250μA	40			V
I _{DSS}	Zero Gate Voltage Drain Current	V _{DS} =40V, V _{GS} =0V			1	μA
		T _J =125°C			30	
V _{GS(th)}	Gate Threshold Voltage	V _{DS} =V _{GS} , I _{DS} =250μA	1.1	1.8	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		0.7	0.9	mΩ
		V _{GS} =4.5V, I _{DS} =15A		1.2	1.7	mΩ
Diode Characteristics						
V _{SD} ^⑤	Diode Forward Voltage	I _{SD} =20A, V _{GS} =0V		0.75	1.2	V
t _{rr}	Reverse Recovery Time	I _{SD} =20A, dI _{SD} /dt=100A/μs		43		ns
Q _{rr}	Reverse Recovery Charge			55		nC
Dynamic Characteristics ^⑥						
R _G	Gate Resistance	V _{GS} =0V,V _{DS} =0V,F=1MHz		1.5		Ω
C _{iss}	Input Capacitance	V _{GS} =0V, V _{DS} =20V, Frequency=200KHz		5450		pF
C _{oss}	Output Capacitance			1705		
C _{rss}	Reverse Transfer Capacitance			95		
t _{d(ON)}	Turn-on Delay Time	V _{DD} =20V, I _{DS} =20A, V _{GS} =10V,R _G =3Ω		18		ns
t _r	Turn-on Rise Time			57		
t _{d(OFF)}	Turn-off Delay Time			84		
t _f	Turn-off Fall Time			59		
Gate Charge Characteristics ^⑥						
Q _g	Total Gate Charge	V _{DS} =20V, V _{GS} =10V, I _{DS} =20A		79		nC
Q _{gs}	Gate-Source Charge			17		
Q _{gd}	Gate-Drain Charge			10		

Notes:

- ①Pulse width limited by safe operating area.
- ②Calculated continuous current based on maximum allowable junction temperature. The package limitation current is 300A.
- ③When 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.
- ④Limited by T_{Jmax} , Starting $T_J = 25^\circ\text{C}$, $I_{ASmax} = 59\text{A}$, $L = 0.5\text{mH}$, $V_{DD} = 32\text{V}$, $R_G = 25\Omega$, $V_{GS} = 10\text{V}$. Part not recommended for use above this value. 100% Final Test at $I_{AS} = 30\text{A}$, $L = 0.5\text{mH}$.
- ⑤Pulse test; Pulse width $\leq 300\mu\text{s}$, duty cycle $\leq 2\%$.
- ⑥Guaranteed by design, not subject to production testing.

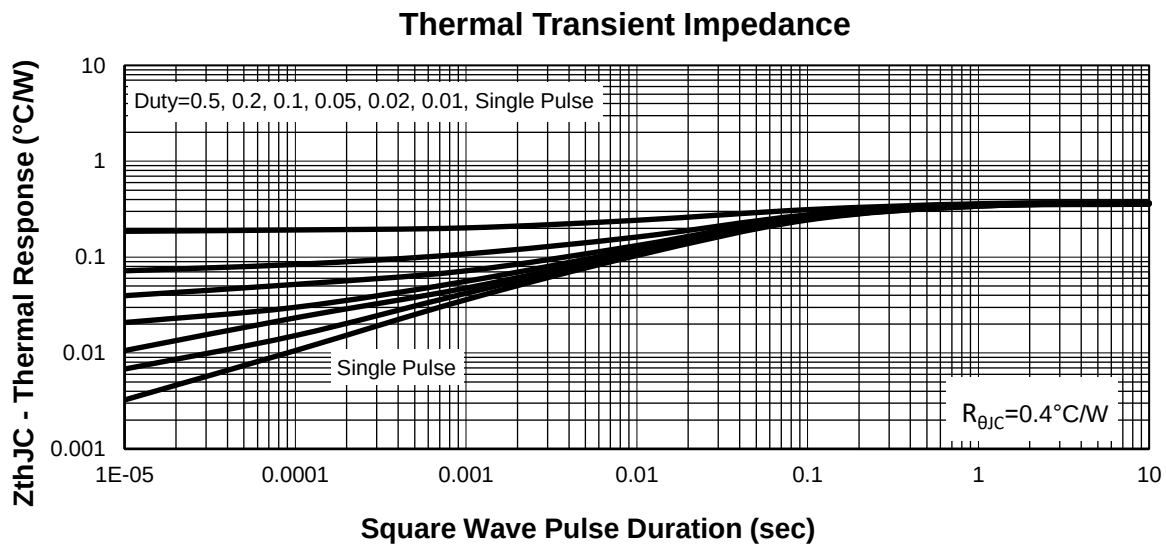
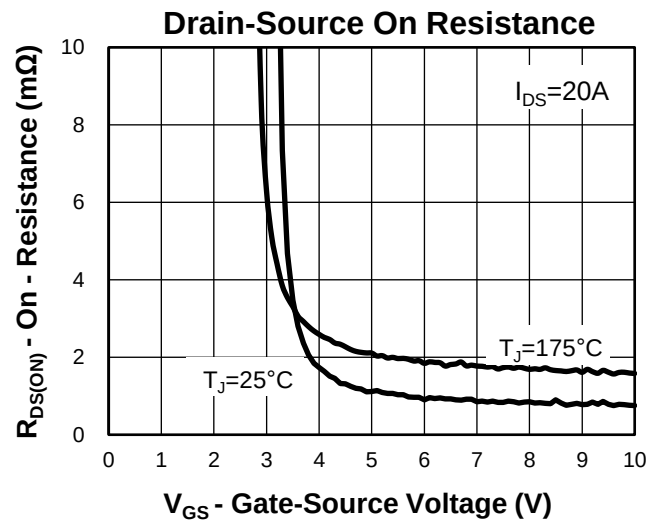
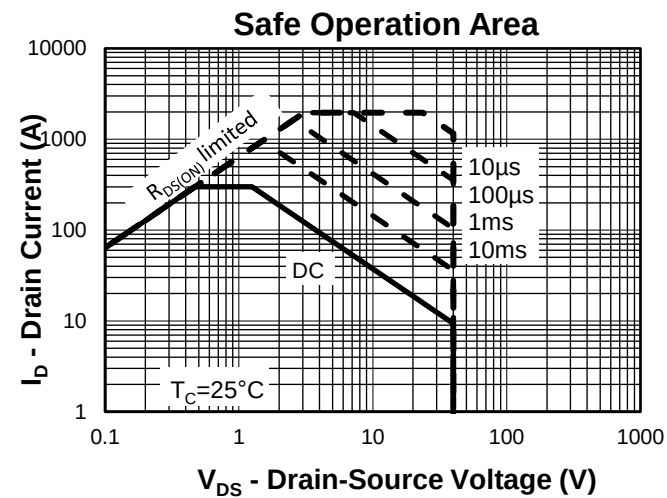
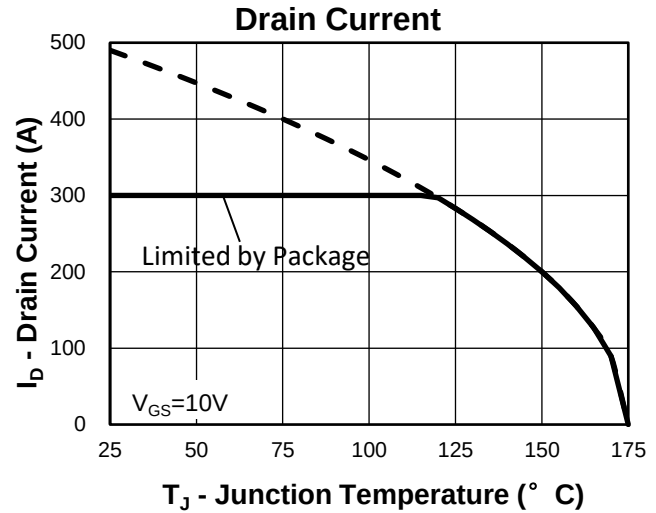
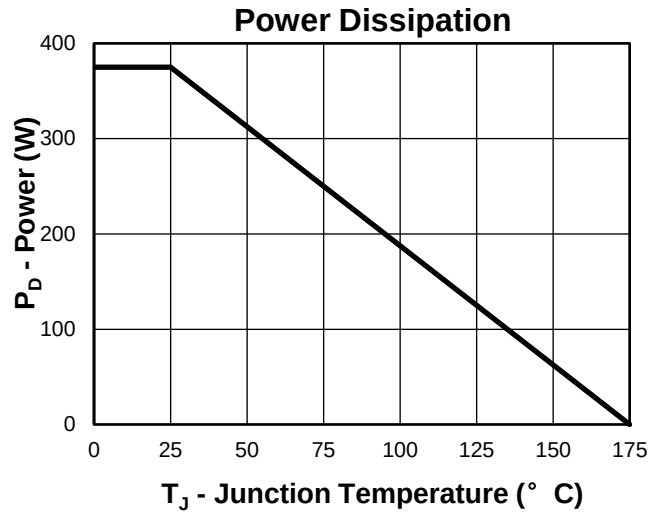
Ordering and Marking Information

Device	Package	Packaging	Quantity	Reel Size	Tape width
KS42028NU3T	LFPAK5060	Tape&Reel	5000	13"	12mm

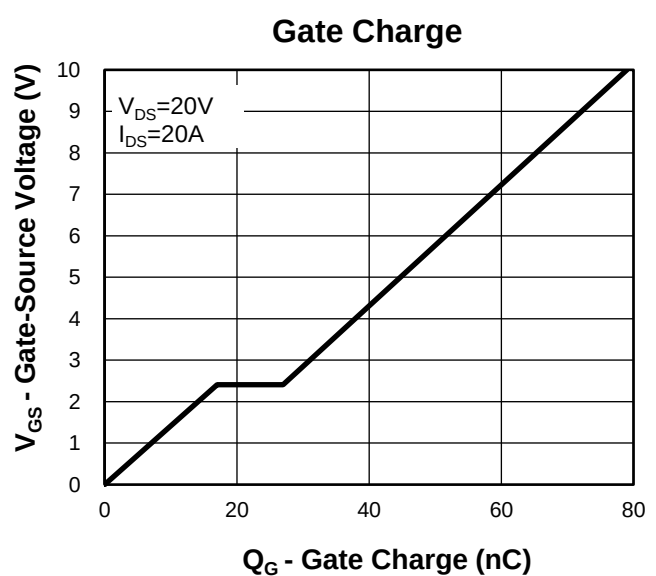
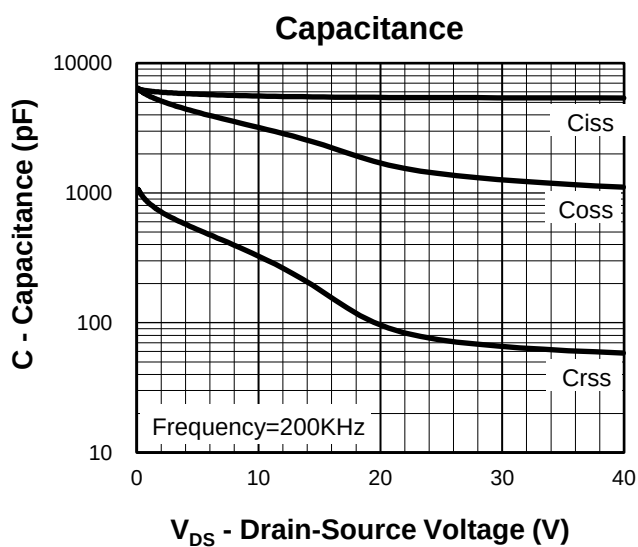
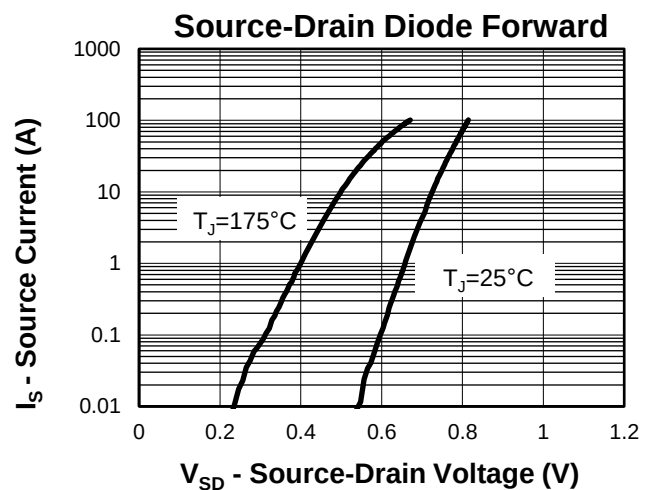
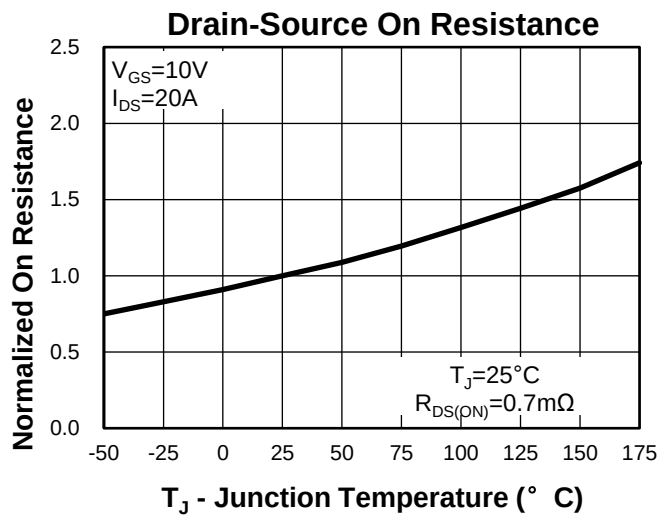
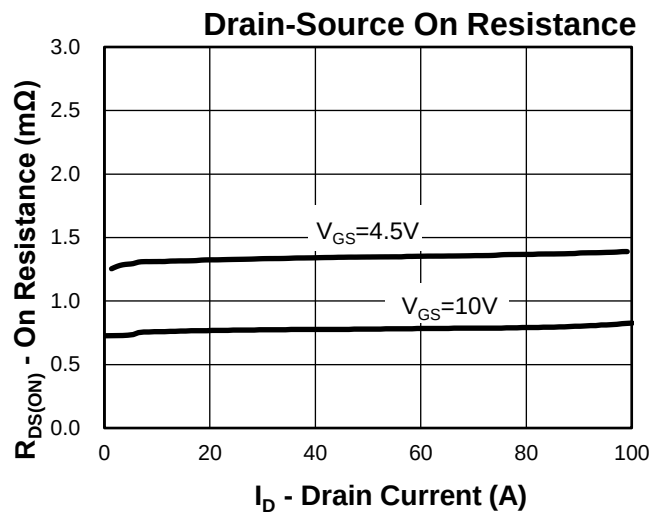
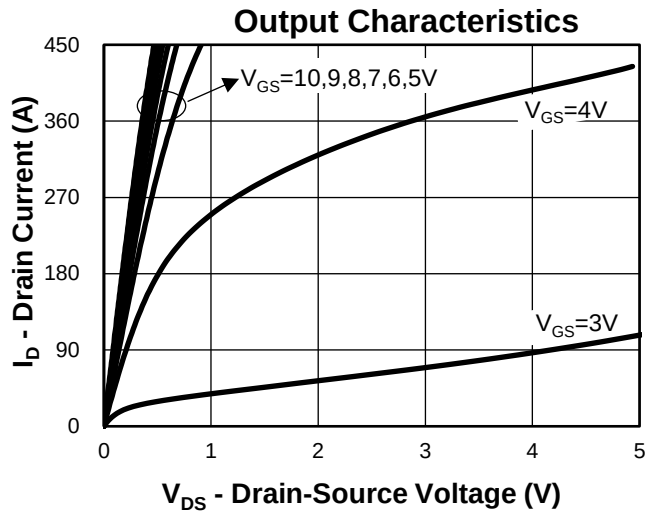


- 1st Line: Kwansemi LOGO
 2nd Line: Kwansemi Code(KS)
 3rd Line: Part Number(42028T)
 4th Line: Lot Number(YWWXXX)

Typical Characteristics

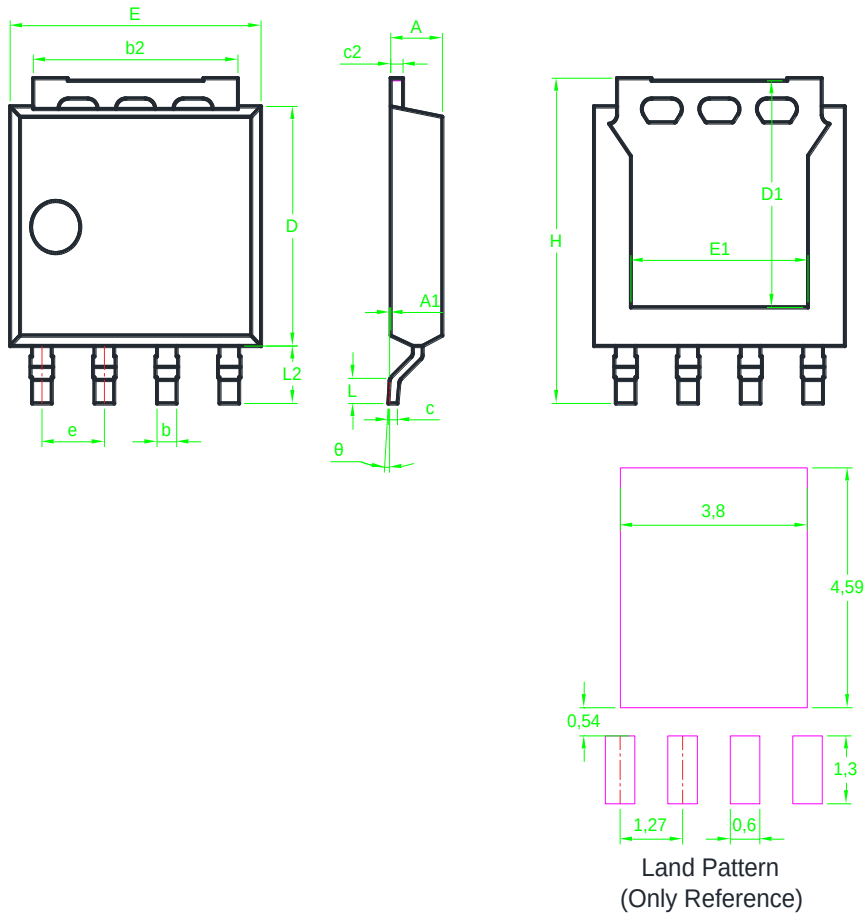


Typical Characteristics



Package Information

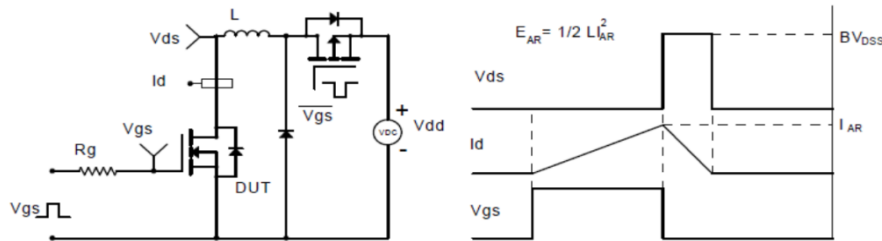
LFPAK5060



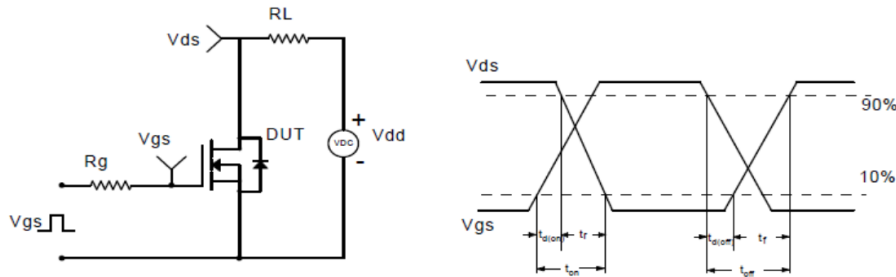
SYMBOL	MM			INCH			SYMBOL	MM			INCH		
	MIN	NOM	MAX	MIN	NOM	MAX		MIN	NOM	MAX	MIN	NOM	MAX
A	1.00	1.05	1.10	0.039	0.041	0.043	e	1.27BSC			0.050BSC		
A1	0.00	*	0.15	0.000	*	0.006	E	5.00	5.10	5.25	0.197	0.201	0.207
b	0.35	0.40	0.50	0.014	0.016	0.020	E1	3.50	3.60	3.70	0.138	0.142	0.146
b2	4.01	4.21	4.41	0.158	0.166	0.174	H	6.05	6.15	6.25	0.238	0.242	0.246
c	0.18	0.20	0.25	0.007	0.008	0.010	L	0.40	0.60	0.80	0.016	0.024	0.031
c2	0.23	0.25	0.30	0.009	0.010	0.012	L2	0.90	1.10	1.30	0.035	0.043	0.051
D	4.44	4.59	4.70	0.175	0.181	0.185	θ	0°	*	8°	0°	*	8°
D1	4.10	4.24	4.40	0.161	0.167	0.173							

Note: Dimensions do not inclusive burrs and mold flash.

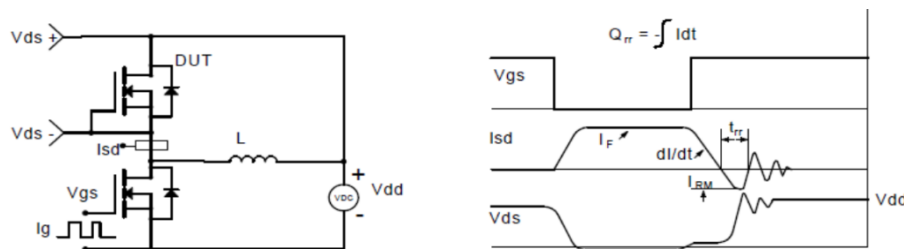
Avalanche Test Circuit and Waveforms



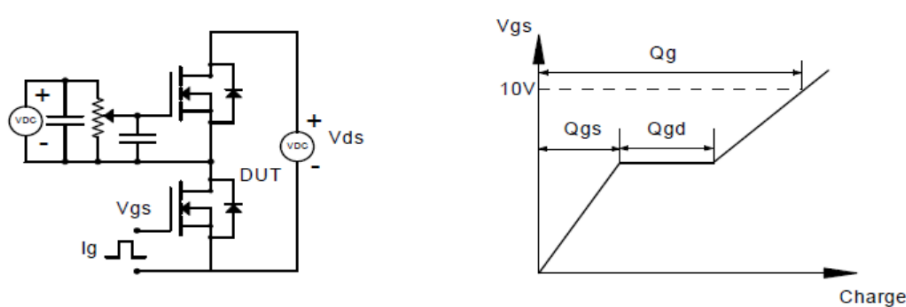
Switching Time Test Circuit and Waveforms



Diode Recovery Test Circuit and Waveforms



Gate Charge Test Circuit and Waveform



Customer Service

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