

Features

- 150V/380A,
 $R_{DS(ON)} = 2m\Omega(Typ.) @ V_{GS}=10V$
- Excellent $Q_G \times R_{DS(on)}$ product(FOM)
- SGT Technology
- High Ruggedness
- 100% Avalanche Tested
- 100% Rg Tested

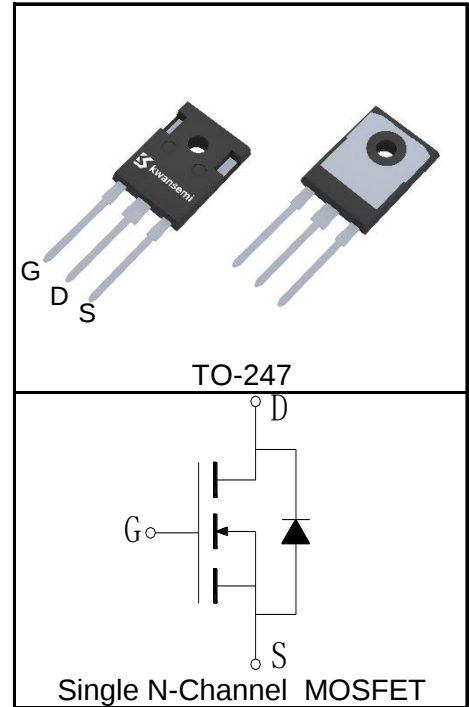
Applications

- Uninterruptible Power Supply
- Inverter



Halogen-Free

Pin Description



Absolute Maximum Ratings

Symbol	Parameter		Rating	Unit
Common Ratings (T _C =25°C Unless Otherwise Noted)				
V _{DSS}	Drain-Source Voltage		150	V
V _{GSS}	Gate-Source Voltage		±20	
T _{Jmax}	Maximum Junction Temperature		175	°C
T _J ,T _{STG}	Operating and Storage Temperature Range		-55 to 175	°C
I _S	Diode Continuous Forward Current	T _C =25°C	380	A
Mounted on Large Heat Sink				
I _{DP} ^①	300μs Pulse Drain Current Tested	T _C =25°C	1520	A
I _D ^②	Continuous Drain Current(V _{GS} =10V)	T _C =25°C	380	A
		T _C =100°C	269	
P _D	Maximum Power Dissipation	T _C =25°C	750	W
		T _C =100°C	375	
R _{θJC}	Thermal Resistance-Junction to Case		0.2	°C/W
R _{θJA} ^③	Thermal Resistance-Junction to Ambient		50	°C/W
Drain-Source Avalanche Ratings				
E _{AS} ^④	Avalanche Energy, Single Pulsed		4900	mJ

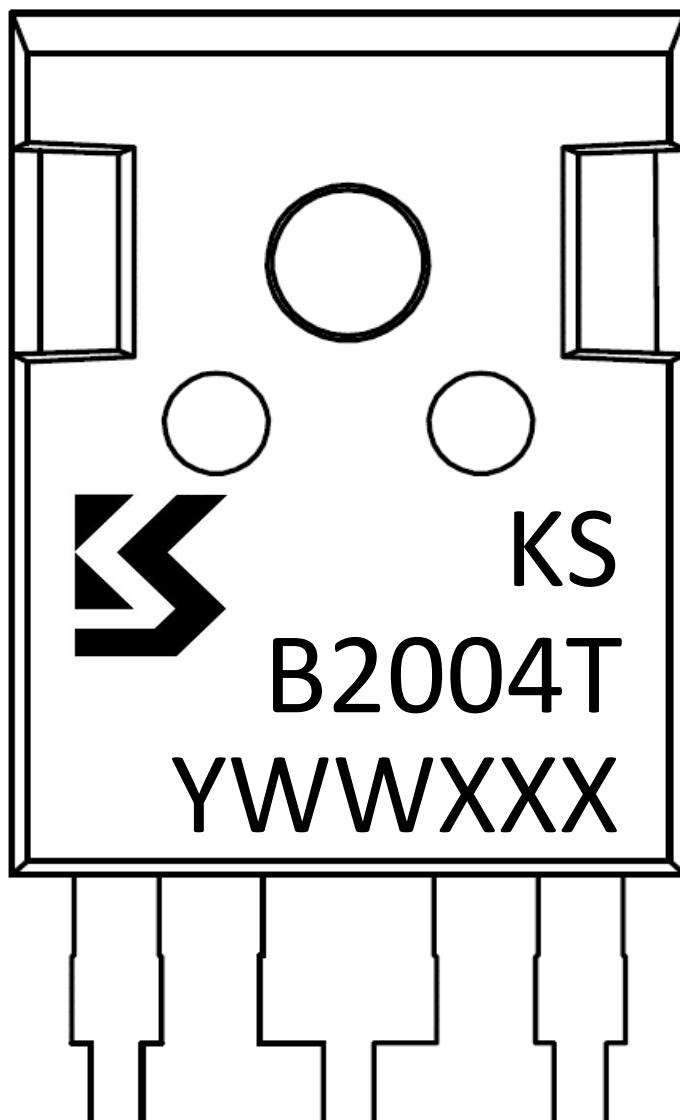
Electrical Characteristics ($T_C=25^{\circ}\text{C}$ Unless Otherwise Noted)

Symbol	Parameter	Test Condition	KSB2004PAT			Unit
			Min.	Typ.	Max.	
Static Characteristics						
BV _{DSS}	Drain-Source Breakdown Voltage	V _{GS} =0V, I _{DS} =250μA	150			V
I _{DSS}	Zero Gate Voltage Drain Current	V _{DS} =150V, V _{GS} =0V			1	μA
		T _J =125°C			30	
V _{GS(th)}	Gate Threshold Voltage	V _{DS} =V _{GS} , I _{DS} =250μA	2.5	3.5	4.5	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} =40A		2	2.5	mΩ
Diode Characteristics						
V _{SD} ^⑤	Diode Forward Voltage	I _{SD} =40A, V _{GS} =0V		0.77	1.2	V
t _{rr}	Reverse Recovery Time	I _{SD} =40A, dI _{SD} /dt=100A/μs		108		ns
Q _{rr}	Reverse Recovery Charge			271		nC
Dynamic Characteristics ^⑥						
R _G	Gate Resistance	V _{GS} =0V, V _{DS} =0V, F=1MHz		1.4		Ω
C _{iss}	Input Capacitance	V _{GS} =0V, V _{DS} =75V, Frequency=1.0MHz		25565		pF
C _{oss}	Output Capacitance			1840		
C _{rss}	Reverse Transfer Capacitance			5		
t _{d(ON)}	Turn-on Delay Time	V _{DD} =75V, I _{DS} =40A, V _{GEN} =10V, R _G =6Ω		33		ns
t _r	Turn-on Rise Time			60		
t _{d(OFF)}	Turn-off Delay Time			112		
t _f	Turn-off Fall Time			21		
Gate Charge Characteristics ^⑥						
Q _g	Total Gate Charge	V _{DS} =75V, V _{GS} =10V, I _{DS} =40A		348		nC
Q _{gs}	Gate-Source Charge			108		
Q _{gd}	Gate-Drain Charge			71		

- Notes:
- ① Pulse width limited by safe operating area.
 - ② Calculated continuous current based on maximum allowable junction temperature. The package limitation current is 90A.
 - 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 $T_J = 25^{\circ}\text{C}$, $I_{ASmax} = 140A$, $L = 0.5\text{mH}$, $V_{DD} = 80V$, $R_G = 25\Omega$, $V_{GS} = 10V$. Part not recommended for use above this value. 100% Final Test at $I_{AS} = 98A$, $L = 0.5\text{mH}$.
 - 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
KSB2004PAT	TO-247	Tube	30	-	-

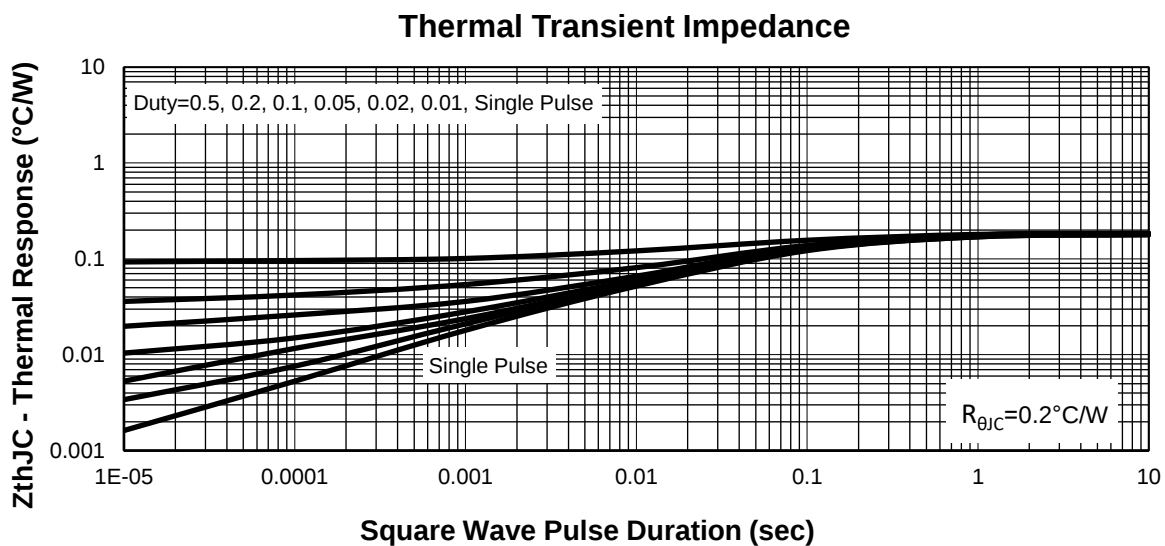
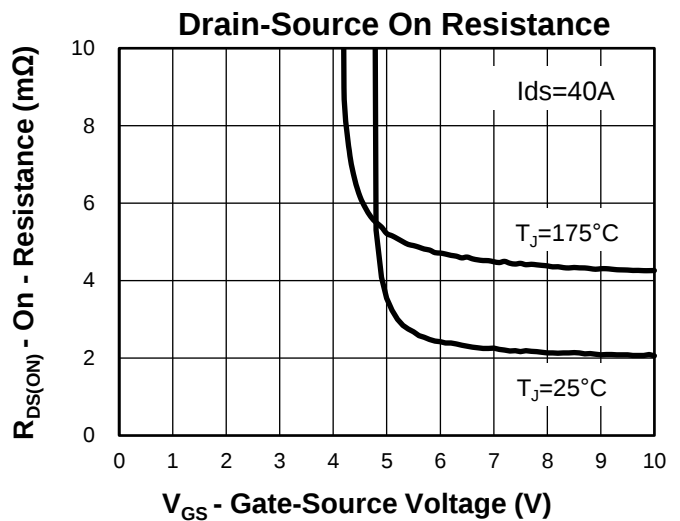
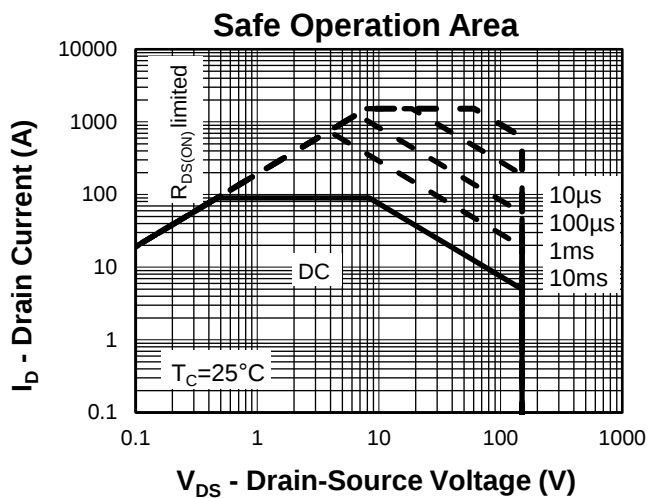
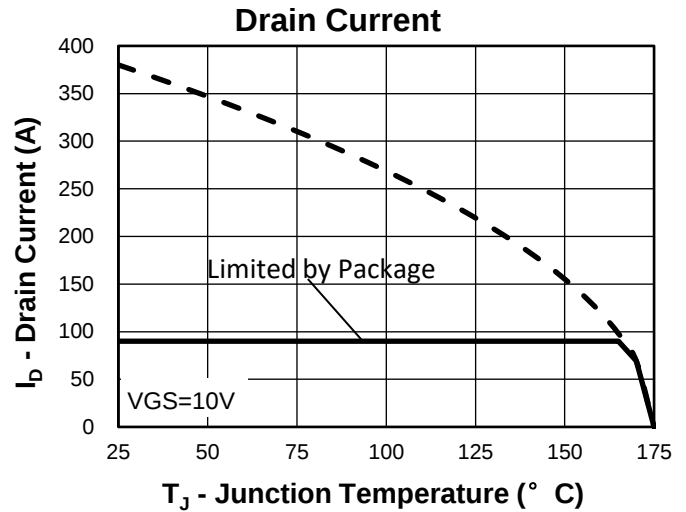
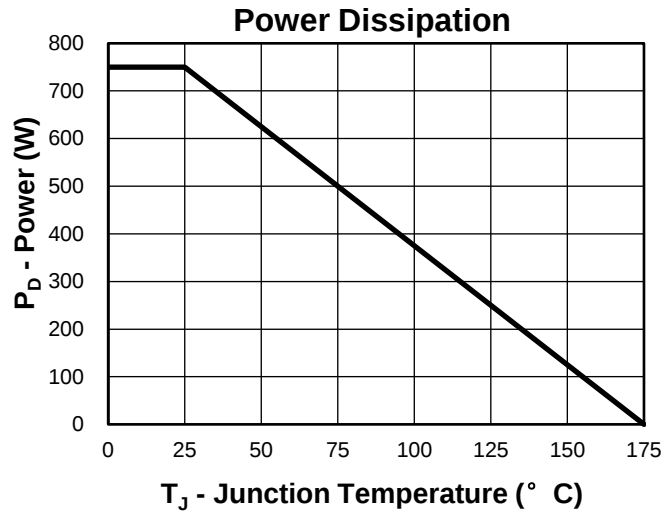


1st Line: Kwansemi LOGO, Kwansemi Code(KS)

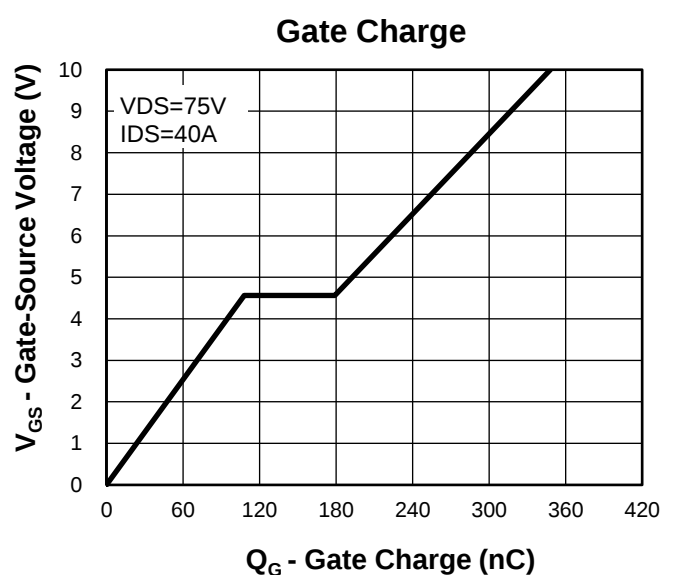
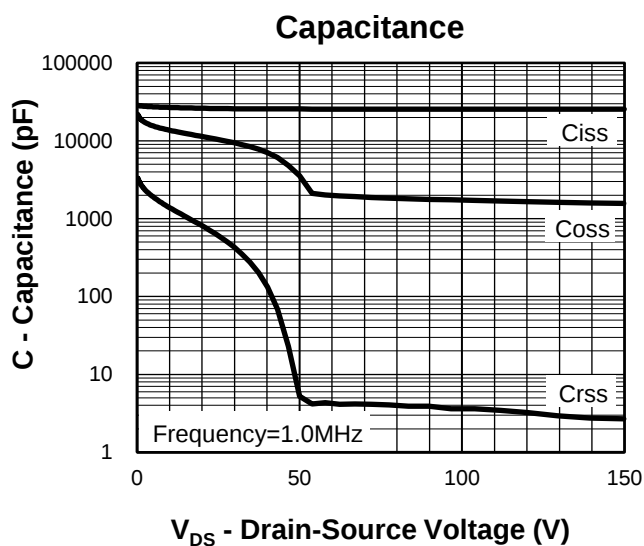
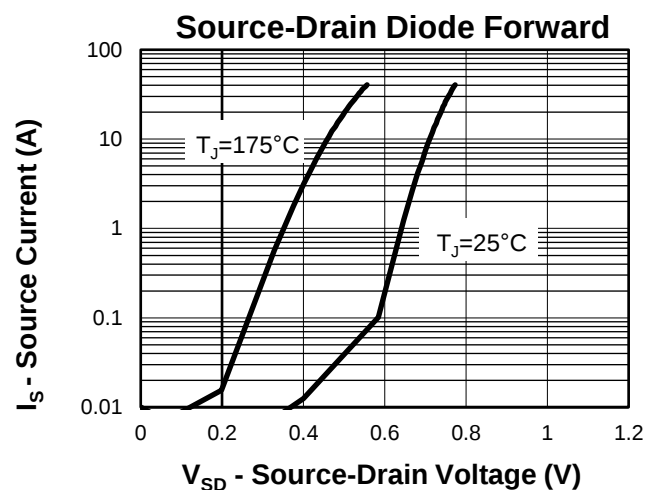
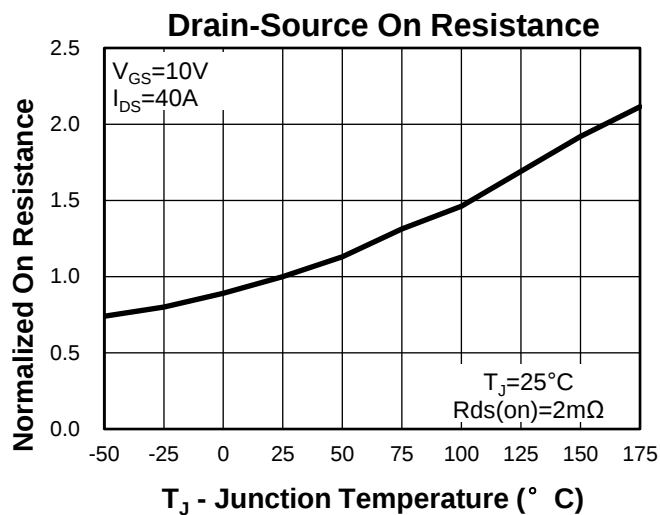
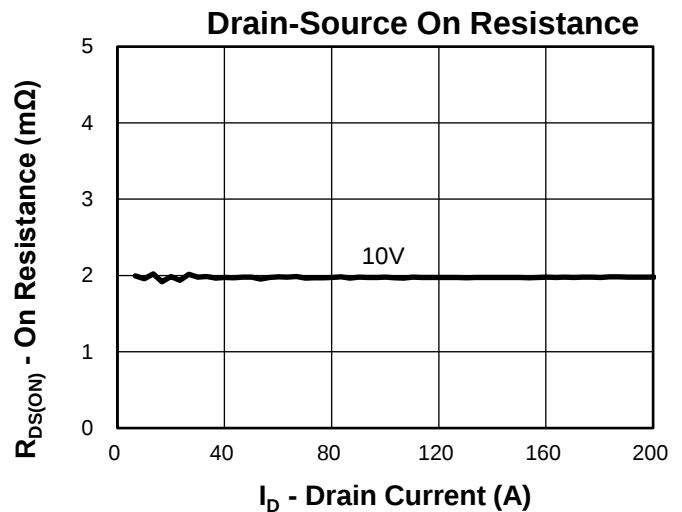
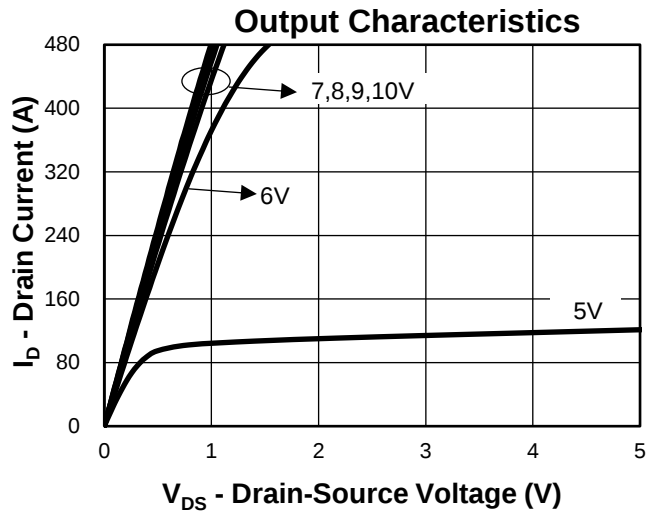
2nd Line: Part Number(B2004T)

3rd Line: Lot Number(YWWXXX)

Typical Characteristics

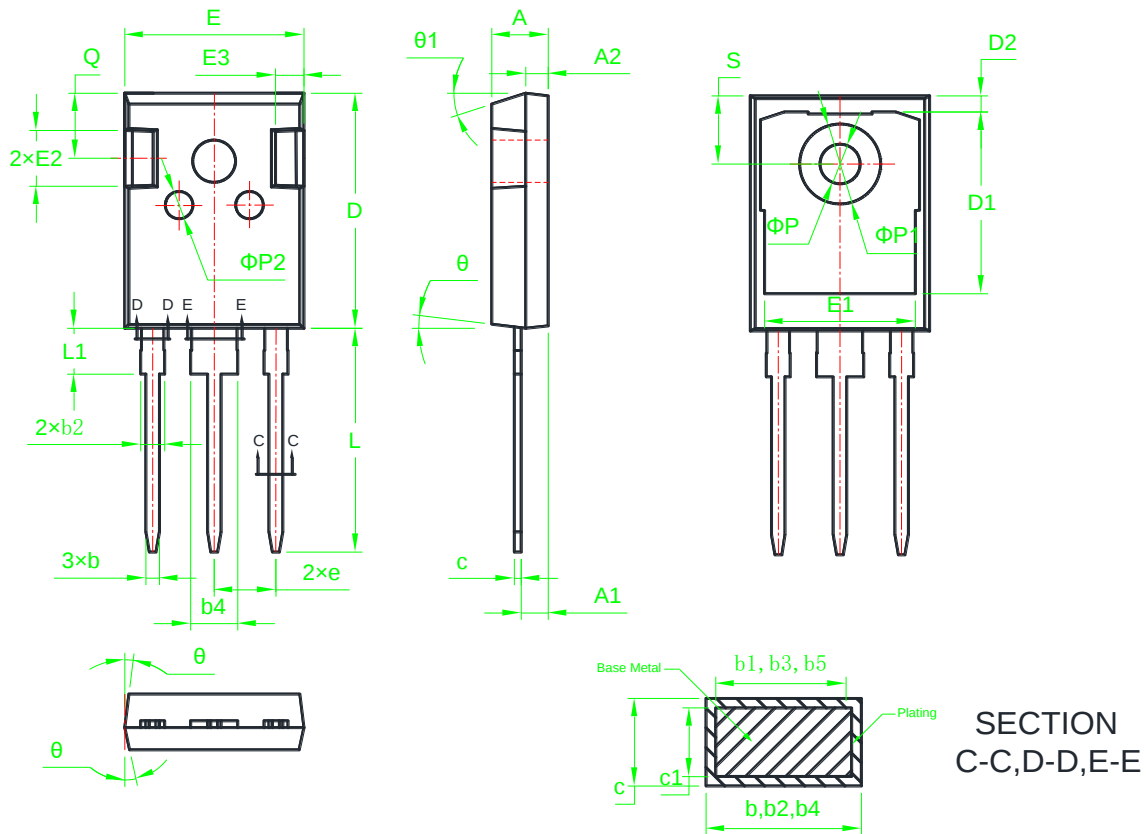


Typical Characteristics



Package Information

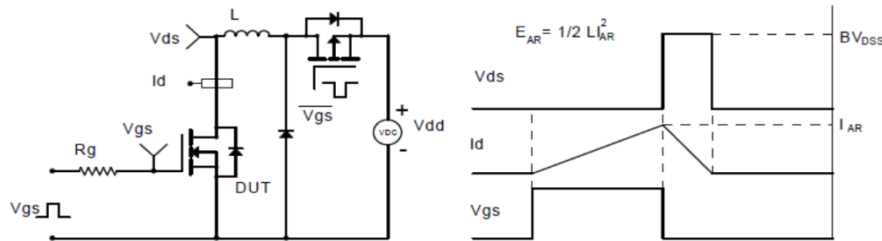
TO-247



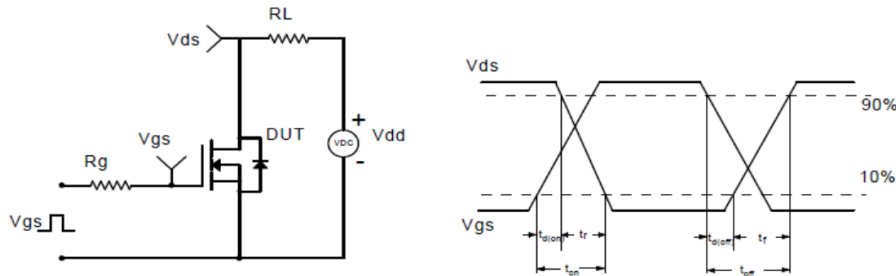
SYMBOL	MM			INCH			SYMBOL	MM			INCH		
	MIN	NOM	MAX	MIN	NOM	MAX		MIN	NOM	MAX	MIN	NOM	MAX
A	4.90	5.00	5.10	0.193	0.197	0.201	E	15.70	15.80	15.90	0.618	0.622	0.626
A1	2.31	2.41	2.51	0.091	0.095	0.099	E1	13.10	13.30	13.50	0.516	0.524	0.531
A2	1.90	2.00	2.10	0.075	0.079	0.083	E2	4.90	5.00	5.10	0.193	0.197	0.201
b	1.16	1.21	1.26	0.046	0.048	0.050	E3	2.40	2.50	2.60	0.094	0.098	0.102
b1	1.15	1.20	1.25	0.045	0.047	0.049	e	5.44BSC			0.214BSC		
b2	1.95	2.10	2.15	0.077	0.083	0.085	L	19.80	19.92	20.10	0.780	0.784	0.791
b3	1.94	2.09	2.14	0.076	0.082	0.084	L1	*	*	4.30	*	*	0.169
b4	3.10	3.15	3.20	0.122	0.124	0.126	Q	5.60	5.80	6.00	0.220	0.228	0.236
b5	3.09	3.14	3.19	0.122	0.124	0.126	S	6.05	6.15	6.25	0.238	0.242	0.246
c	0.59	0.61	0.66	0.023	0.024	0.026	ØP	3.50	3.60	3.70	0.138	0.142	0.146
c1	0.58	0.60	0.65	0.023	0.024	0.026	ØP1	7.00	7.20	7.40	0.276	0.283	0.291
D	20.90	21.00	21.10	0.823	0.827	0.831	ØP2	2.40	2.50	2.60	0.094	0.098	0.102
D1	16.25	16.55	16.85	0.640	0.652	0.663	θ	5°	7°	9°	5°	7°	9°
D2	1.05	*	1.35	0.041	*	0.053	θ 1	13°	16°	19°	13°	16°	19°

Note: Dimensions do not inclusive burrs and mold flash.

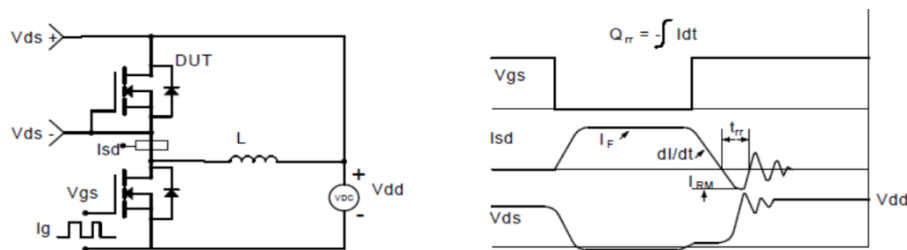
Avalanche Test Circuit and Waveforms



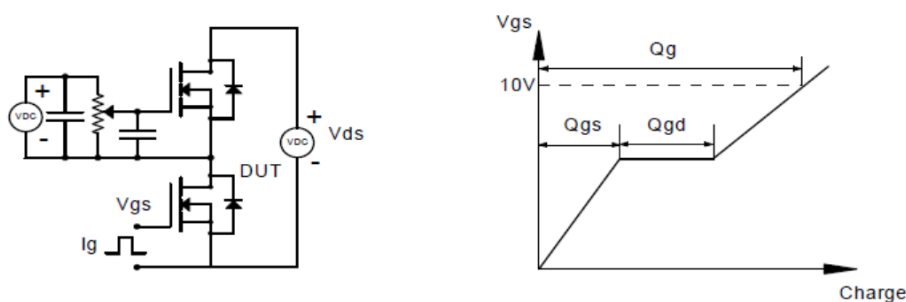
Switching Time Test Circuit and Waveforms



Diode Recovery Test Circuit and Waveforms



Gate Charge Test Circuit and Waveform



Customer Service

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