

Features

- 650V/21A,
 $R_{DS(ON)} = 155m\Omega(Typ.)@V_{GS}=10V$
- Excellent $Q_G \times R_{DS(on)}$ product(FOM)
- SuperJunction Technology
- Low Switching Loss
- 100% Rg and Avalanche Tested

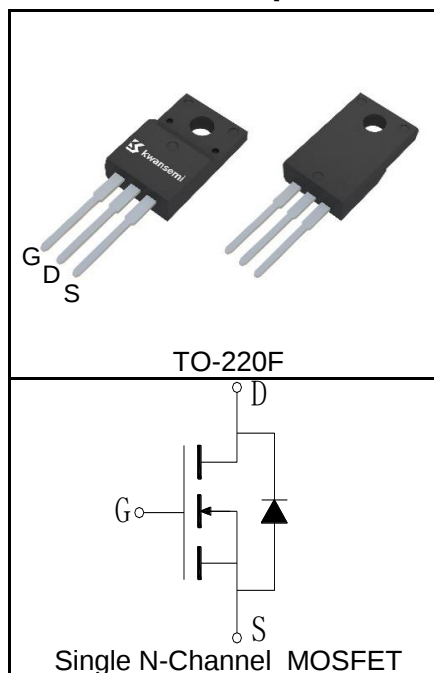
Applications

- LED Lighting
- Charger
- Adapter



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		650	V
V _{GSS}	Gate-Source Voltage		±30	
T _{Jmax}	Maximum Junction Temperature		150	°C
T _J ,T _{STG}	Operating and Storage Temperature Range		-55 to 150	°C
dv/dt	MOSFET dv/dt ruggedness, V _{DS} =0...480 V		50	V/ns
dv/dt	Reverse diode dv/dt, V _{DS} =0...480 V, I _{SD} ≤I _D		15	V/ns
V _{ISO}	Insulation Withstand Voltage (AC-RMS)		4000	V
I _S	Diode Continuous Forward Current	T _C =25°C	21	A
Mounted on Large Heat Sink				
I _{DP} ^①	Pulse Drain Current	T _C =25°C	63	A
I _D ^②	Continuous Drain Current(V _{GS} =10V)	T _C =25°C	21	A
		T _C =100°C	13	
P _D	Maximum Power Dissipation	T _C =25°C	34	W
		T _C =100°C	13	
R _{θJC}	Thermal Resistance-Junction to Case		3.65	°C/W
R _{θJA} ^③	Thermal Resistance-Junction to Ambient		62.5	°C/W
Drain-Source Avalanche Ratings				
E _{AS} ^④	Avalanche Energy, Single Pulsed		1250	mJ

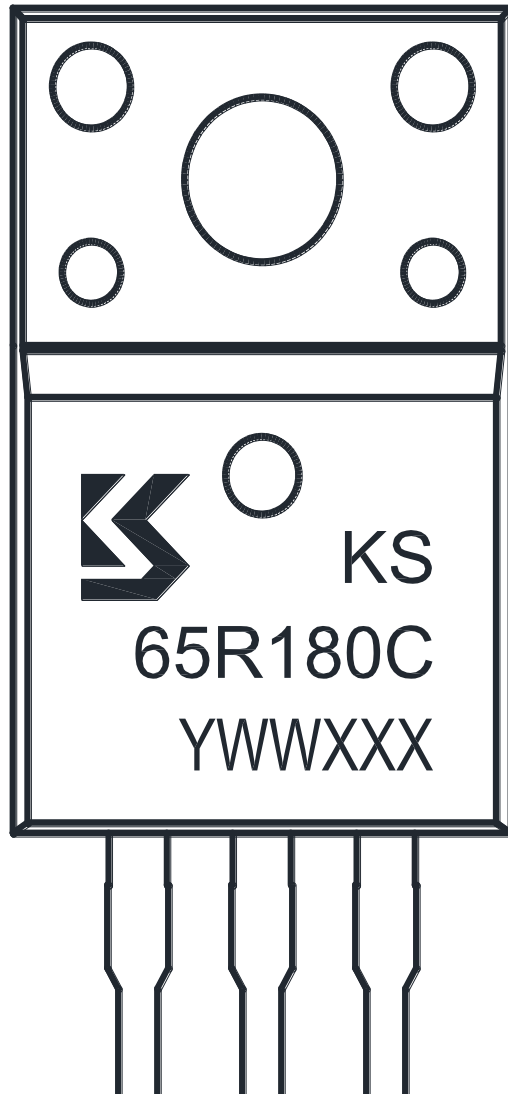
Electrical Characteristics ($T_C=25^{\circ}\text{C}$ Unless Otherwise Noted)

Symbol	Parameter	Test Condition	Rating			Unit
			Min.	Typ.	Max.	
Static Characteristics						
BV _{DSS}	Drain-Source Breakdown Voltage	V _{GS} =0V, I _{DS} =250μA	650			V
I _{DSS}	Zero Gate Voltage Drain Current	V _{DS} =650V, V _{GS} =0V			1	μA
		T _J =125°C			30	
V _{GS(th)}	Gate Threshold Voltage	V _{DS} =V _{GS} , I _{DS} =250μA	2	3	4	V
I _{GSS}	Gate Leakage Current	V _{GS} =±30V, V _{DS} =0V			±100	nA
R _{DS(ON)} ⑤	Drain-Source On-state Resistance	V _{GS} =10V, I _{DS} =10.5A		155	180	mΩ
		V _{GS} =6V, I _{DS} =6A		180	220	mΩ
Diode Characteristics						
V _{SD} ⑤	Diode Forward Voltage	I _{SD} =21A, V _{GS} =0V		0.88	1.2	V
t _{rr}	Reverse Recovery Time	I _{SD} =10.5A, dI _{SD} /dt=100A/μs		272		ns
Q _{rr}	Reverse Recovery Charge			2.6		μC
I _{rrm}	Peak Reverse Recovery Current			12		A
Dynamic Characteristics ⑥						
R _G	Gate Resistance	V _{GS} =0V,V _{DS} =0V,F=1MHz		10		Ω
C _{iss}	Input Capacitance	V _{GS} =0V, V _{DS} =325V, Frequency=200KHz		1530		pF
C _{oss}	Output Capacitance			40		
C _{rss}	Reverse Transfer Capacitance			3		
t _{d(ON)}	Turn-on Delay Time	V _{DD} =325V, I _{DS} =10.5A, V _{GEN} =10V,R _G =3Ω		15		ns
t _r	Turn-on Rise Time			14		
t _{d(OFF)}	Turn-off Delay Time			61		
t _f	Turn-off Fall Time			17		
Gate Charge Characteristics ⑥						
Q _g	Total Gate Charge	V _{DS} =325V, V _{GS} =10V, I _{DS} =10.5A		41		nC
Q _{gs}	Gate-Source Charge			8		
Q _{gd}	Gate-Drain Charge			19		
V _{plateau}	Gate Plateau Voltage			5.5		V

- Notes:
- ①Pulse width limited by safe operating area.
 - ②Calculated continuous current based on maximum allowable junction temperature.
 - 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 $T_J = 25^{\circ}\text{C}$, $I_{ASmax} = 5A$, $L=100\text{mH}$, $V_{DD} = 150V$, $R_G = 25\Omega$, $V_{GS}=10V$. Part not recommended for use above this value. 100% Final Test at $I_{AS}=4A$, $L=30\text{mH}$.
 - ⑤Pulse test; Pulse width $\leq 300\mu s$, duty cycle $\leq 2\%$.
 - ⑥Guaranteed by design, not subject to production testing.

Ordering and Marking Information

Device	Package	Packaging	Quantity	Reel Size	Tape width
KS65R180FAJC1	TO-220F	Tube	50	-	-

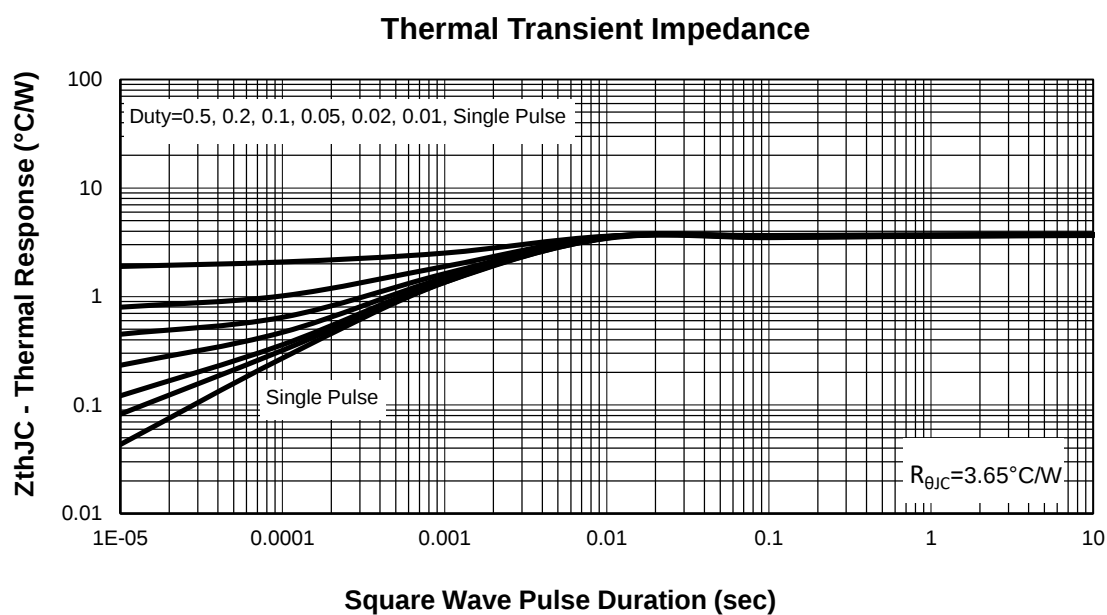
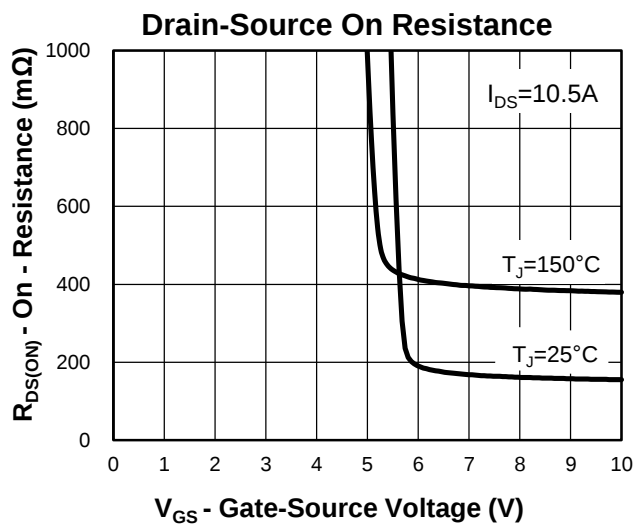
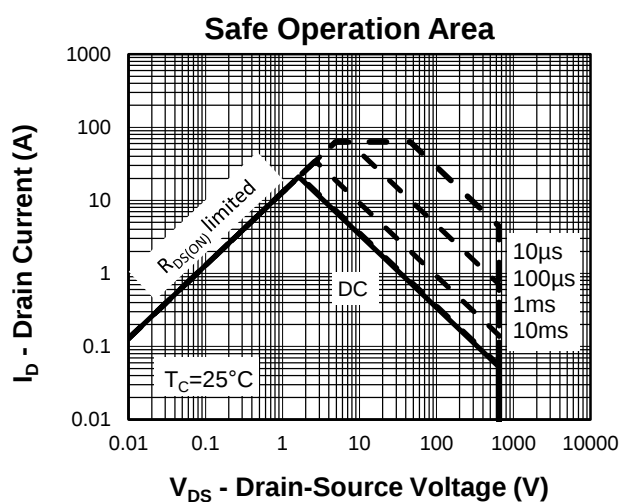
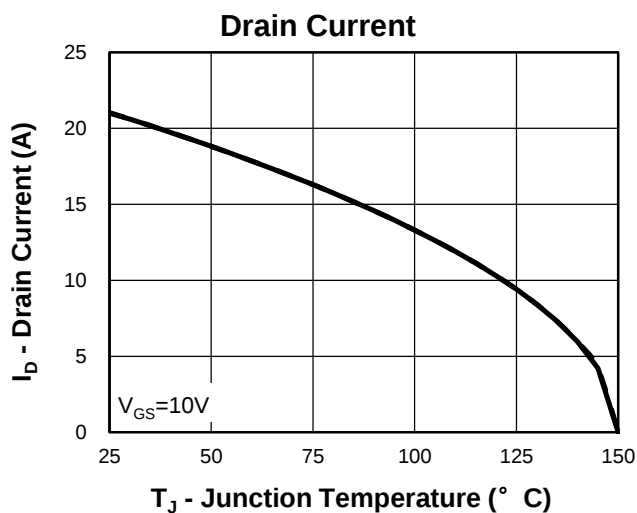
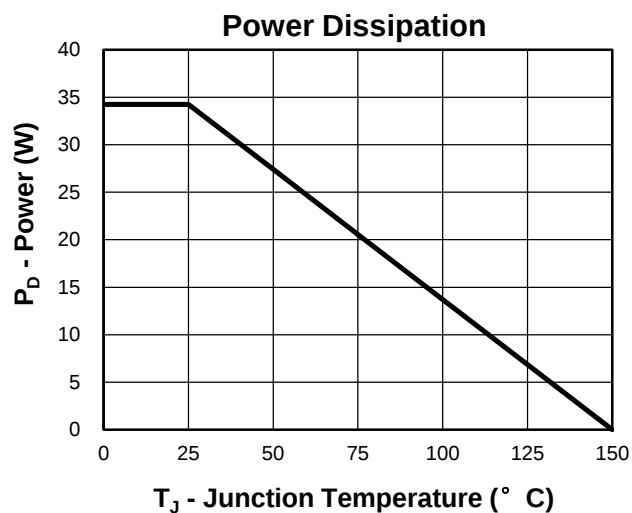


1st Line: Kwansemi LOGO, Kwansemi Code(KS)

2nd Line: Part Number(65R180C)

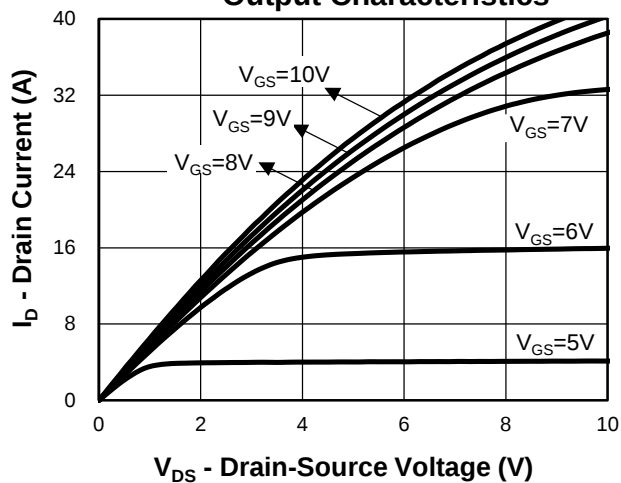
3rd Line: Lot Number(YWWXXX)

Typical Characteristics

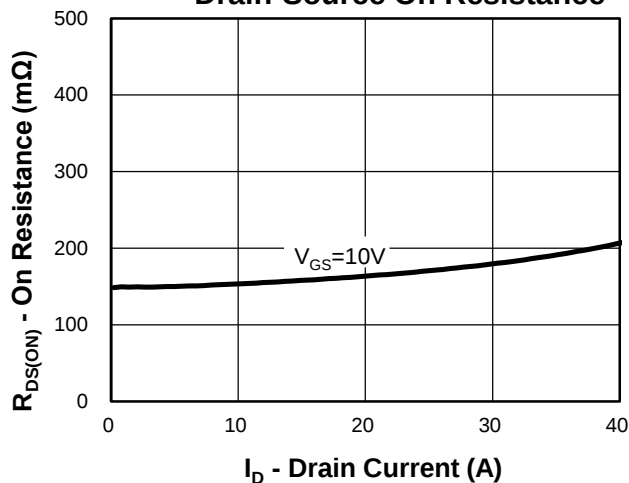


Typical Characteristics

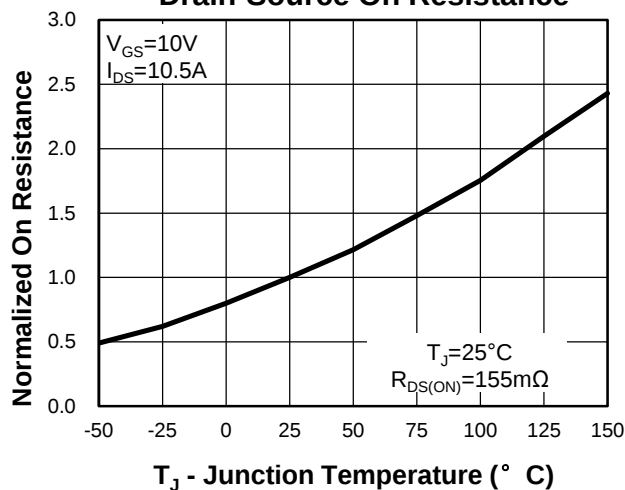
Output Characteristics



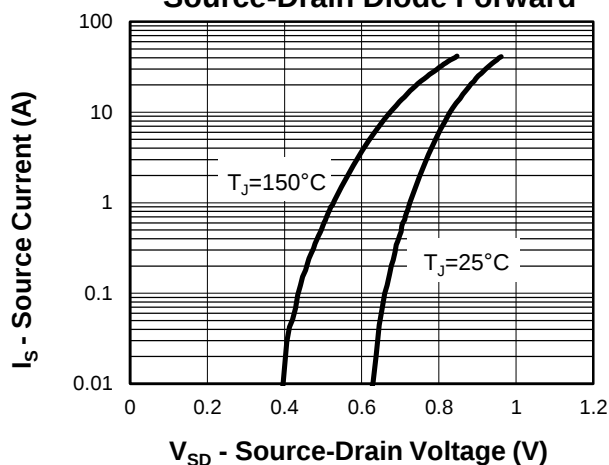
Drain-Source On Resistance



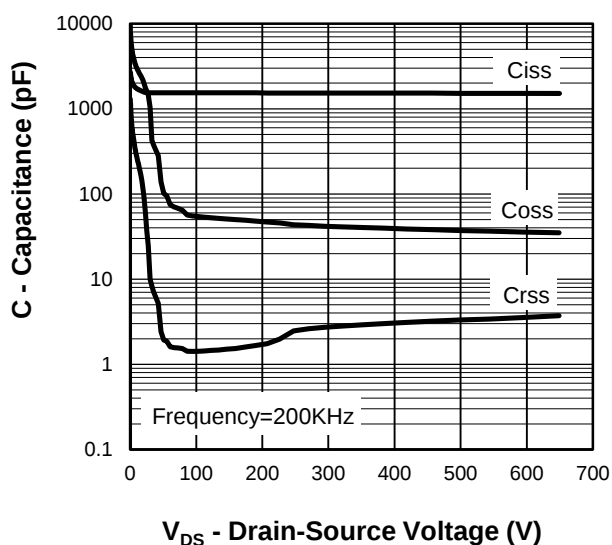
Drain-Source On Resistance



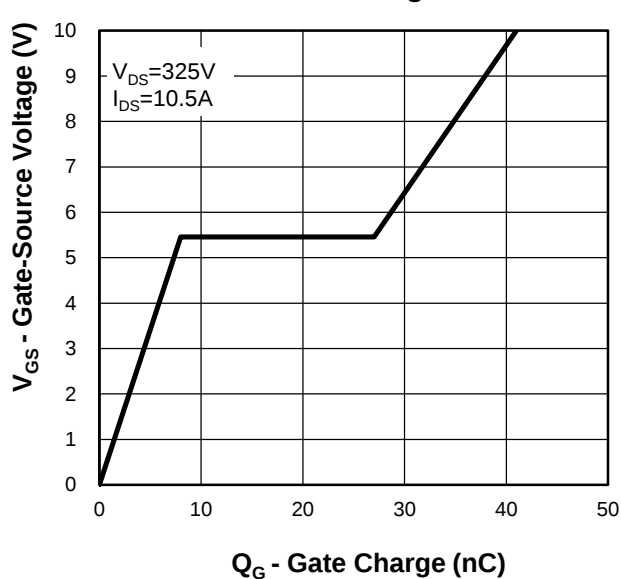
Source-Drain Diode Forward

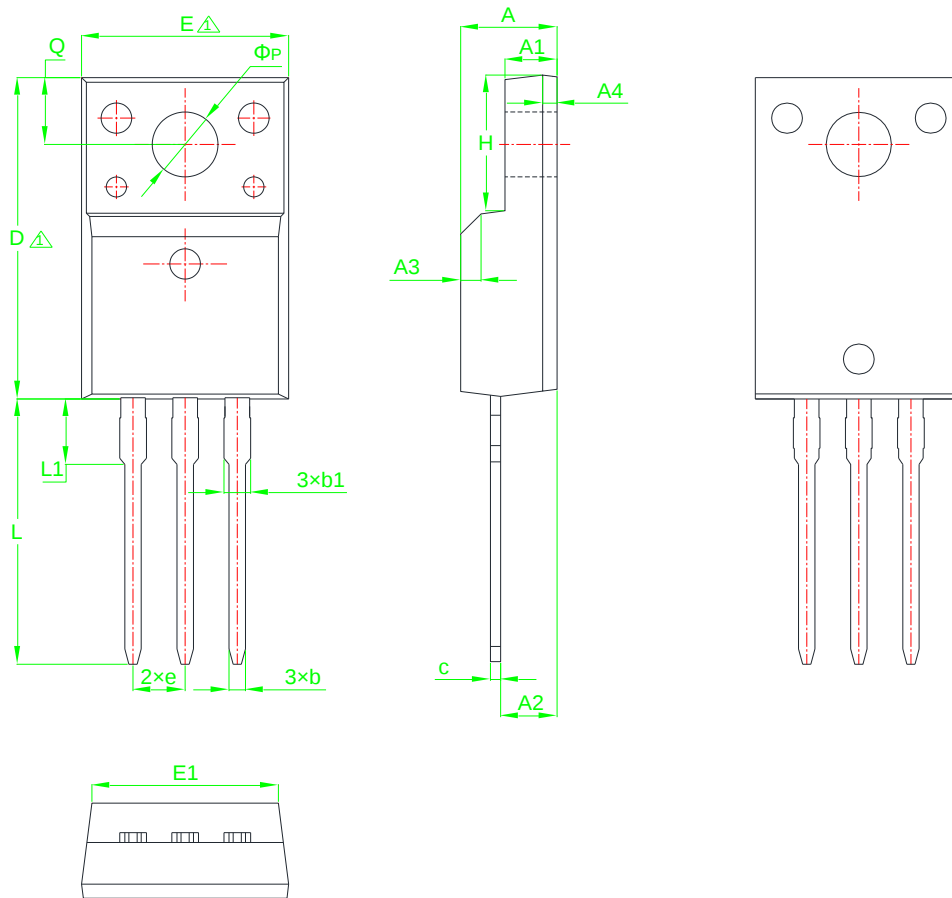


Capacitance



Gate Charge

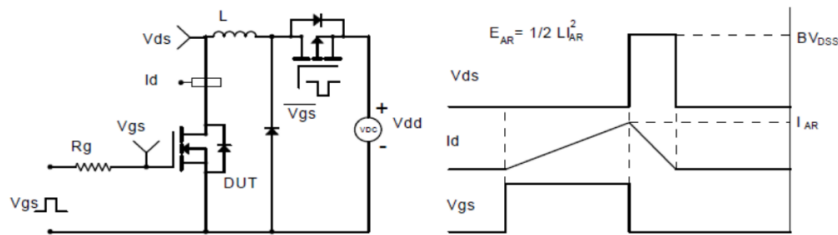


Package Information
TO-220F


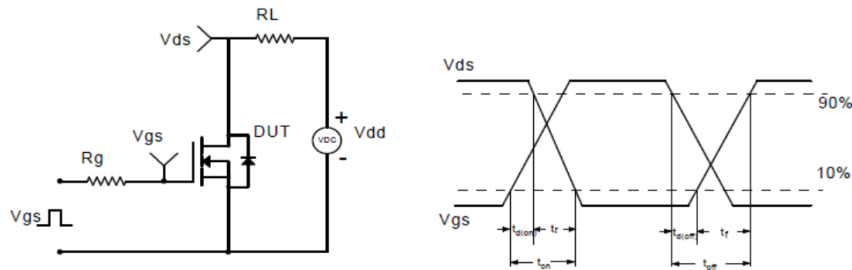
SYMBOL	MM			INCH			SYMBOL	MM			INCH		
	MIN	NOM	MAX	MIN	NOM	MAX		MIN	NOM	MAX	MIN	NOM	MAX
A	4.50	4.70	4.90	0.177	0.185	0.193	E	9.96	10.16	10.36	0.392	0.400	0.408
A1	2.34	2.54	2.74	0.092	0.100	0.108	E1	9.25	9.45	9.65	0.364	0.372	0.380
A2	2.55	2.75	2.95	0.100	0.108	0.116	e	2.54BSC			0.100BSC		
A3	1.00×45° REF			0.039×45° REF			H	6.20	*	6.90	0.244	*	0.272
A4	0.70REF			0.028REF			L	12.90	13.10	13.30	0.508	0.516	0.524
b	0.70	0.80	0.90	0.028	0.031	0.035	L1	3.15	3.30	3.45	0.124	0.130	0.136
b1	1.10	1.20	1.35	0.043	0.047	0.053	Q	3.20	3.30	3.40	0.126	0.130	0.134
c	0.35	0.50	0.65	0.014	0.020	0.026	ØP	3.08	3.18	3.28	0.121	0.125	0.129
D	15.70	15.90	16.10	0.618	0.626	0.634							

△ Dimensions D and E do not include mold flash protrusions or gate burrs.

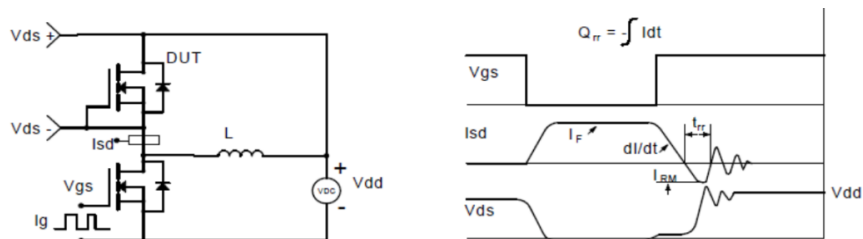
Avalanche Test Circuit and Waveforms



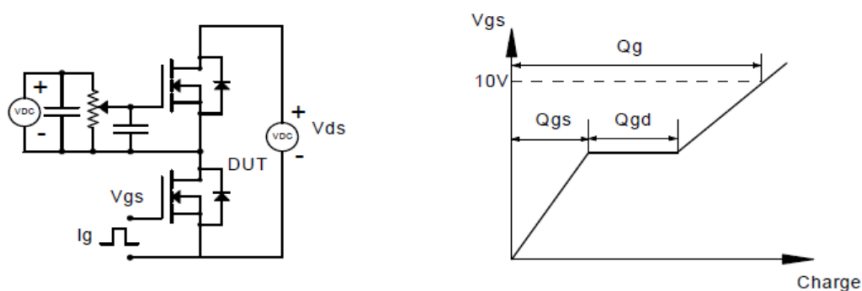
Switching Time Test Circuit and Waveforms



Diode Recovery Test Circuit and Waveforms



Gate Charge Test Circuit and Waveform



Customer Service

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