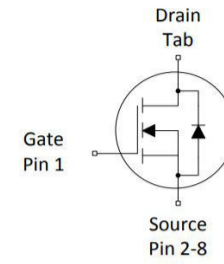




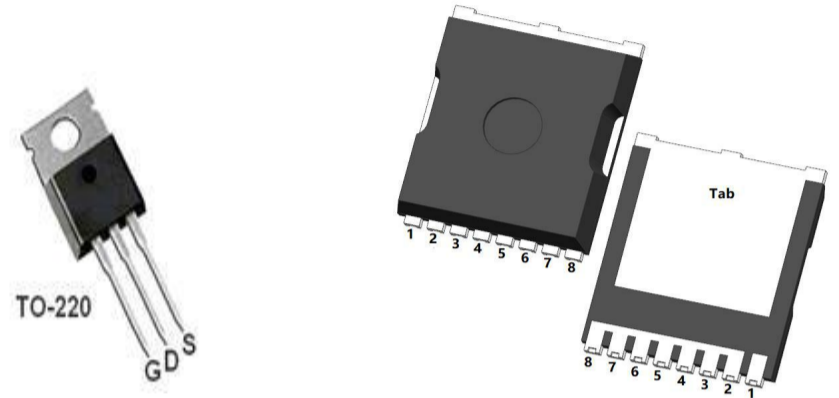
General Description

- Trench Power SGT technology
- Very low on-resistance $R_{DS(ON)}$
- Low Gate Charge
- Excellent Gate Charge x $R_{DS(ON)}$ Product



Product Summary

V_{DS}	40V
I_D (at $V_{GS} = 10V$)	180A
$R_{DS(ON)}$ (at $V_{GS} = 10V$)	< 0.9m Ω



Parameter	Symbol	Conditions	Limit	Unit
Drain-to-Source Voltage	V_{DS}		40	V
Gate-to-Source Voltage	V_{GS}		± 20	V
Continuous Drain Current, Package Limited (TC = 25°C)	I_D	(1) DFN5x6 Clip bonding	180	A
Continuous Drain Current, Silicon Limited (TC = 25°C)	I_D	(2) Rated according to $R_{\theta JC}$.	350	A
Continuous Drain Current, Silicon Limited (TC = 100°C)			240	
Continuous Drain Current, Silicon Limited (TA = 25°C)	I_D	(3) Rated according to $R_{\theta JA}$. (4) Surface-mounted on 1 inch ² FR4 board, 2 oz Cu.	100	A
Continuous Drain Current, Silicon Limited (TA = 100°C)			28	
Pulsed Drain Current	I_{Dm}	(5) Limited by maximum T_J .	720	A
Power Dissipation (TC = 25°C)	P_D		240	W
Linear Derating Factor	—		0.91	W/°C
Avalanche energy, single pulse	E_{AS}	(6) Starting $T_J = 25^\circ C$, $L = 0.1mH$, $I_{AS} = 42A$, $V_{GS} = 10V$.	333	mJ
Avalanche Current	I_{AS}	(7) Pulse width limited by maximum T_J .	—	A

Maximum ratings, at $T_J = 25^\circ C$, unless otherwise specified

Parameter	Symbol	Limit	Unit
Junction Temperature	T_J	-55 to 175	°C
Storage Temperature	T_{STG}	-55 to 175	°C



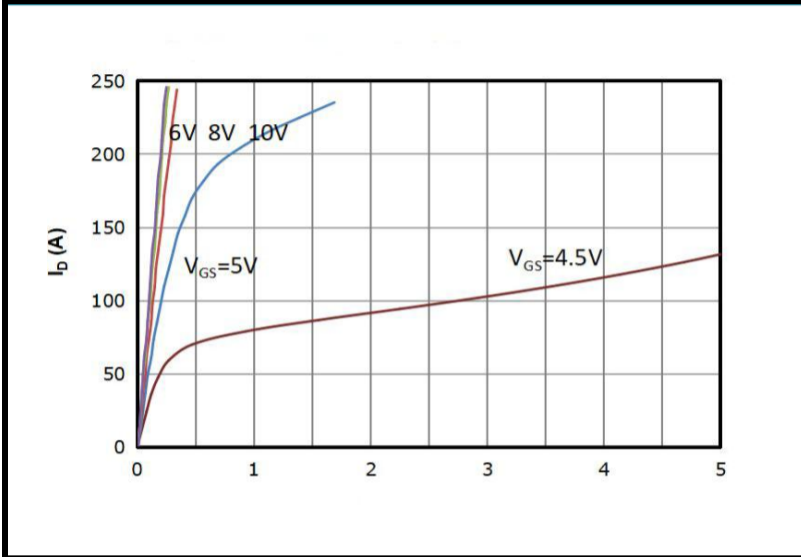
Parameter	Symbol	Conditions	Values			Unit
			Min.	Typ.	Max.	
Drain-source breakdown voltage	B_{VDSS}	$V_{GS} = 0V, I_D = 250\mu A$	40	—	—	v
Drain-to-Source Leakage Current	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = 250\mu A$	2.0	—	4.0	v
Gate-source leakage current	I_{DSS}	$V_{DS}=40V, T_J=25^\circ C, V_{GS}=0V$	—	—	1	μA
		$V_{DS}=40V, T_J=125^\circ C, V_{GS}=0V$	—	—	100	μA
Gate threshold voltage	I_{GSS}	$V_{DS} = 0V, V_{GS} = \pm 20V$	—	—	± 100	nA
Drain-to-Source On-Resistance	$R_{DS(ON)}$	$V_{GS} = 4.5V, I_D = 30A$	—	TBC	TBC	m Ω
		$V_{GS} = 10V, I_D = 30A$	—	0.9	1.1	m Ω
Gate resistance	R_G		—	1.3	—	Ω

Parameter	Symbol	Conditions	Values			Unit
			Min.	Typ.	Max.	
Forward Transconductance	g_{fs}	$V_{DS} = 5V, I_D = 30A, T_J = 25^\circ C$	—	83	—	S
Input Capacitance	C_{iss}	$V_{GS} = 0V, T_J = 25^\circ C,$ $f = 1MHz, V_{DS} = 15V$	—	6946	—	pF
Output Capacitance	C_{oss}		—	2204	—	
Reverse Transfer Capacitance	C_{rss}		—	42	—	
Turn-On Delay Time	$t_{d(on)}$	$V_{GS} = 10V, V_{DS} = 15V,$ $I_D = 30A, R_G = 3.0\Omega, T_J = 25^\circ C$	—	0.6	—	nS
Rise Time	t_r		—	1.8	—	
Turn-Off Delay Time	$t_{d(off)}$		—	79	—	
Fall Time	t_f		—	4	—	
Gate-to-Source Charge	Q_{gs}	$V_{GS} = 10V, T_J = 25^\circ C,$ $V_{DS} = 15V, I_D = 30A$	—	36	—	nC
Gate-to-Drain Charge	Q_{gd}		—	22	—	
Total Gate Charge	Q_g		—	107	—	

Parameter	Symbol	Conditions	Values			Unit
			Min.	Typ.	Max.	
Forward Voltage	V_{SD}	$V_{GS} = 0V, I_S = 50A, T_J = 25^\circ C$	—	0.8	1.3	V
Reverse Recovery Time	t_{rr}	$V_{GS} = 0V, I_S = 30A,$ $dI_S/dt = 100A/\mu s, T_J = 25^\circ C$	—	141	—	nS
Reverse Recovery Charge	Q_{rr}		—	333	—	nC

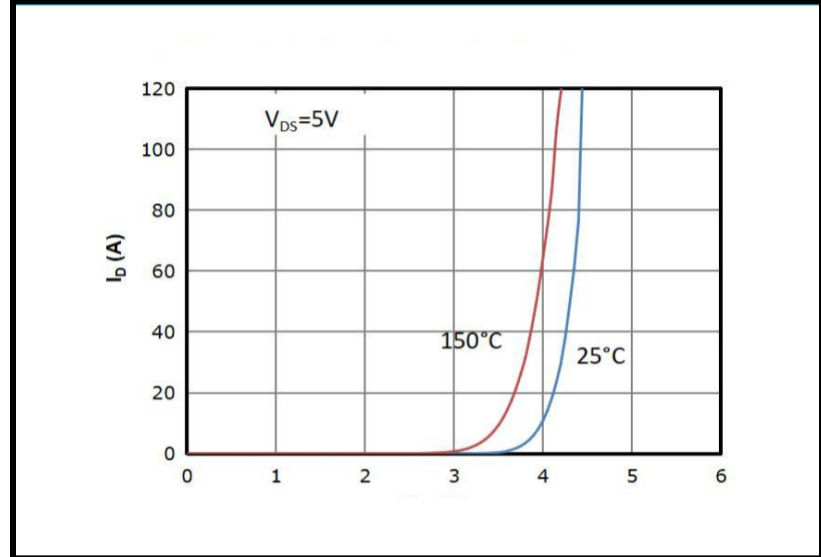


Fig. 1 Output characteristics



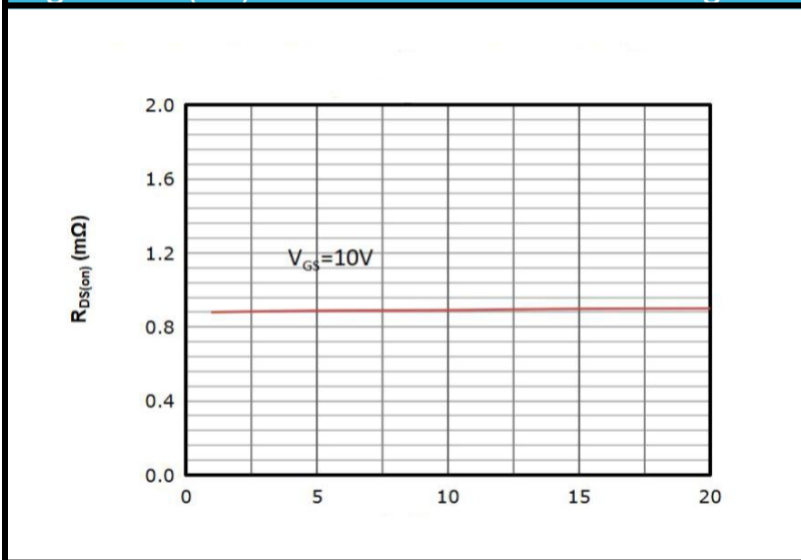
V_{DS} (V)

Fig. 2 Transfer characteristics



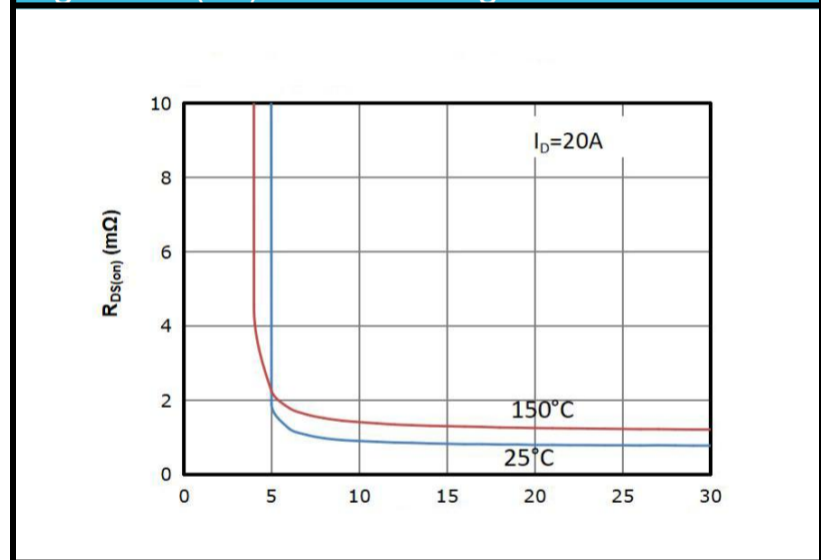
V_{GS} (V)

Fig.3 Rds(on) vs. drain current Gate voltage



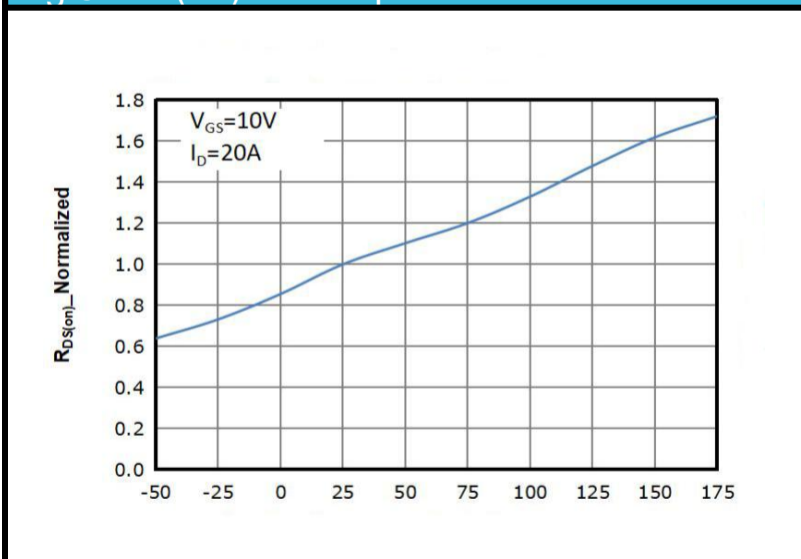
I_D (A)

Fig.4 Rds(on) vs. Gate voltage



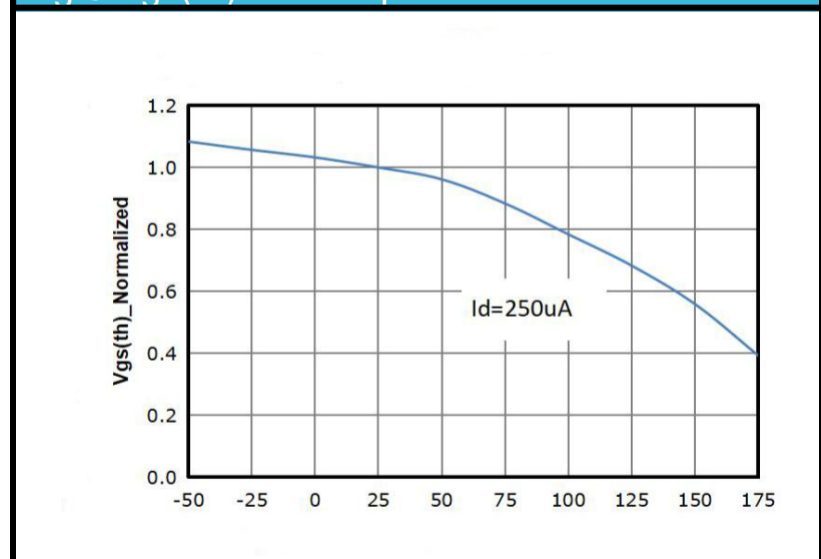
V_{GS} (V)

Fig.5 Rds(on) vs. Temperature



T_j -Junction Temperature(°C)

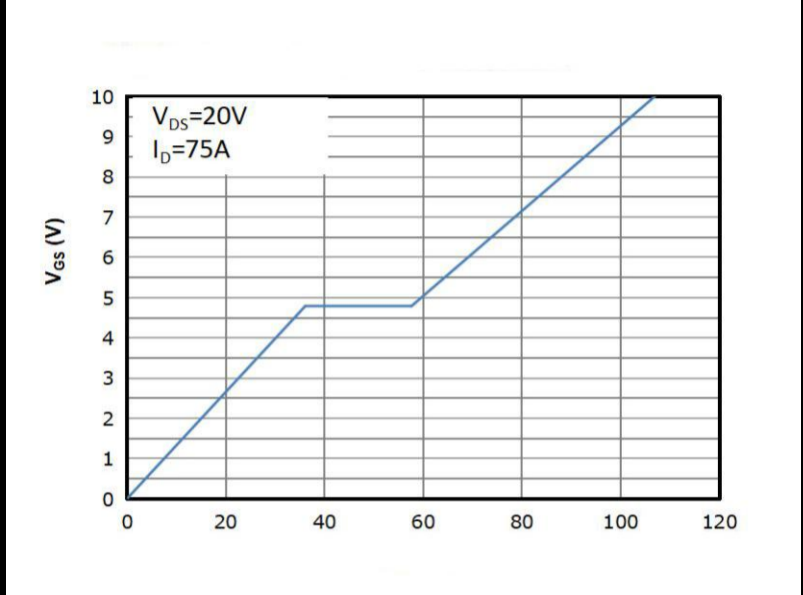
Fig.6 Vgs(th) vs. Temperature



T_j -Junction Temperature(°C)

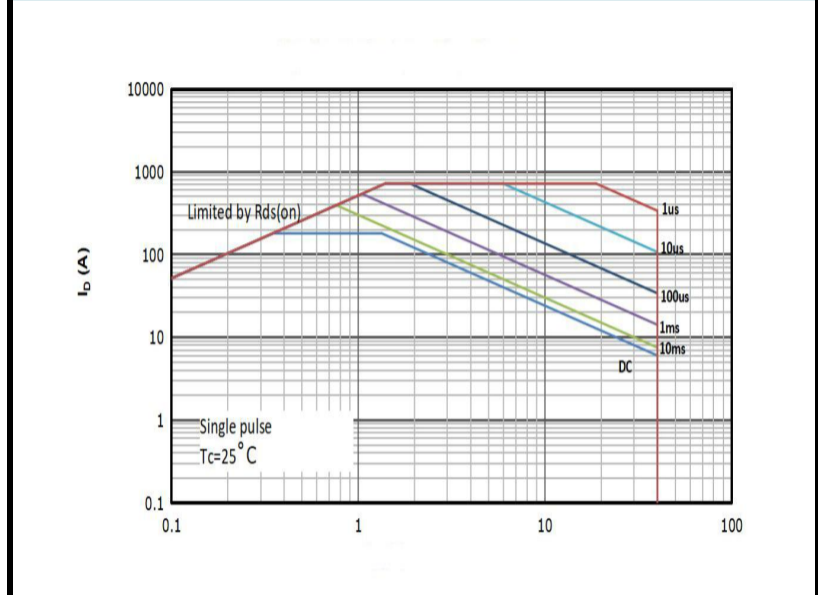


Fig.7 Gate-to-source voltage Vs. gate charge



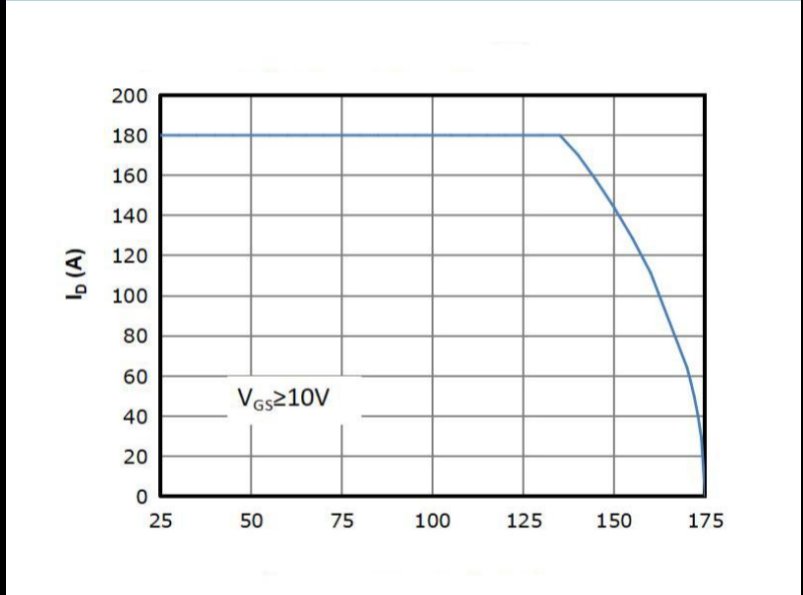
Qg(nC)

Fig. 9 Safe Operating Area



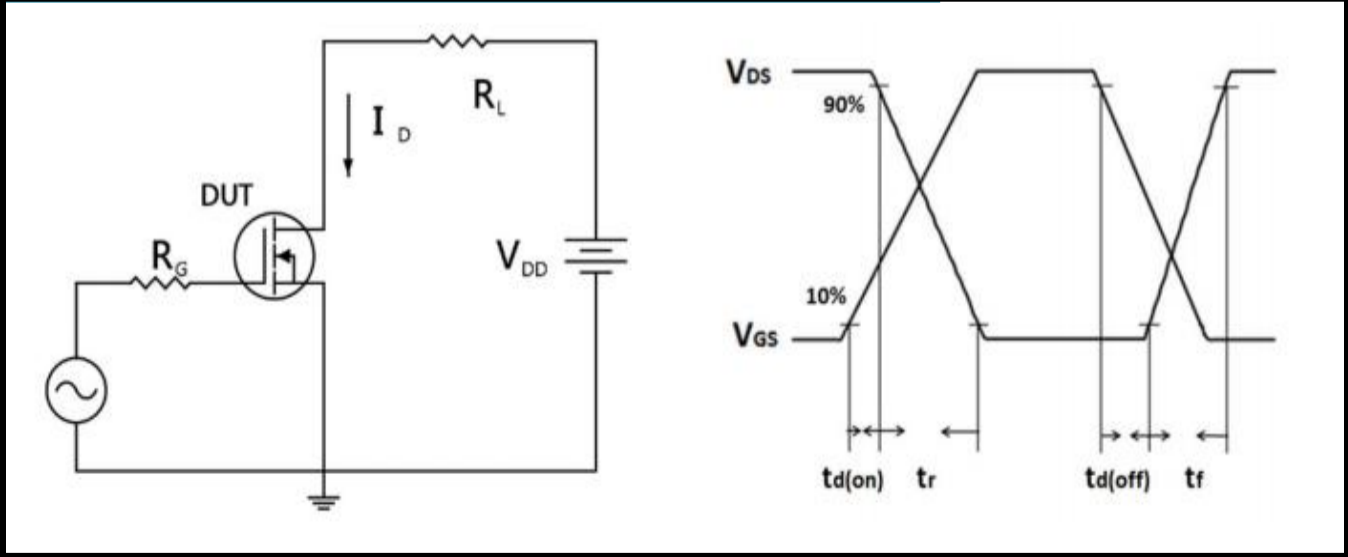
VDS(V)

Fig.8 DrainCurrent Derating



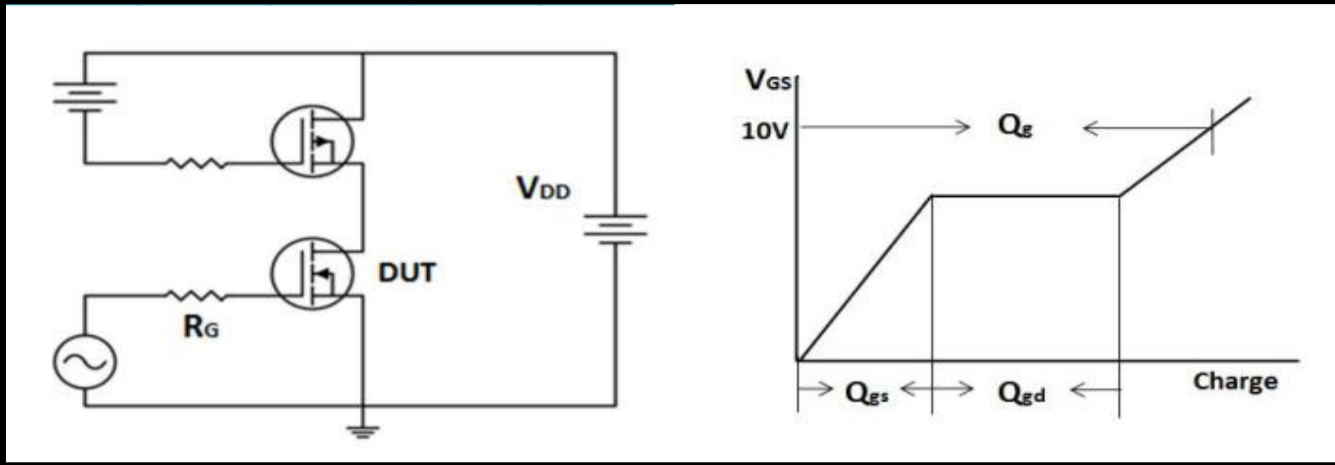
Case Temperature($^\circ C$)

Resistive switching time test circuit & waveforms

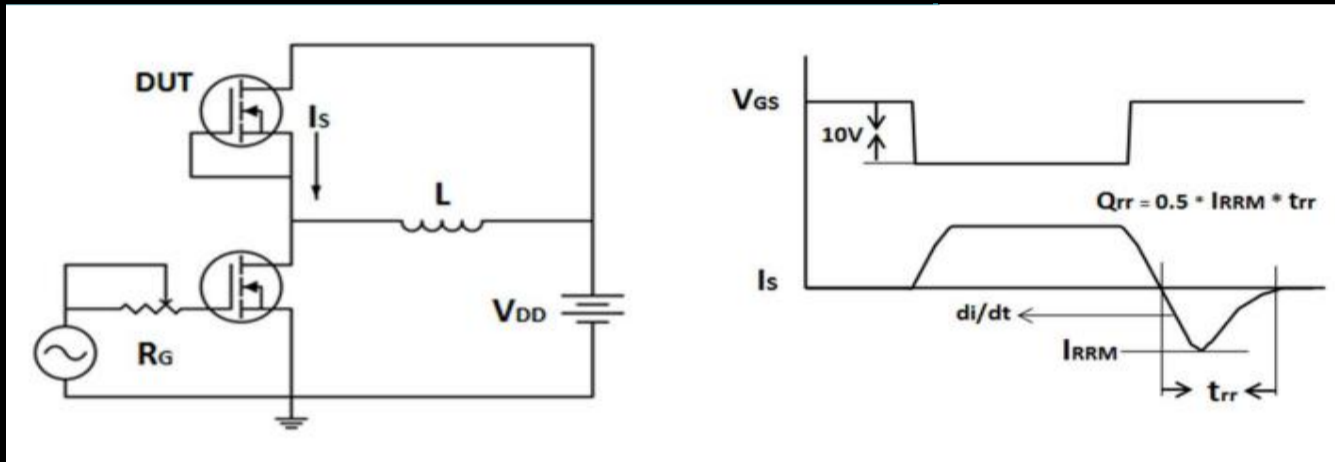




Gate charge test circuit & waveform



Peak diode recovery dv/dt test circuit & waveforms



Unclamped inductive switching test circuit & waveforms

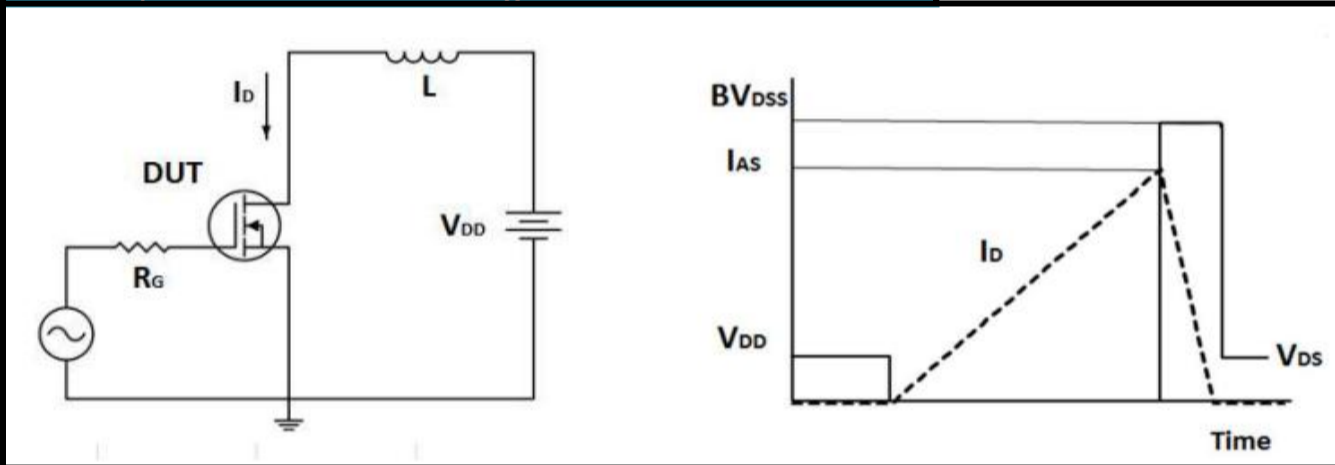


Table9 Package Drawing

SYMBOL	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	2.20	2.40	0.087	0.094
A1	0.05	0.20	0.002	0.008
b	0.65	0.85	0.026	0.033
b1	0.30	0.50	0.012	0.020
C	0.35	0.65	0.014	0.026
D	10.35	10.70	0.407	0.421
D1	3.15	3.45	0.124	0.136
E	9.80	10.00	0.386	0.394
E1	9.65	9.95	0.380	0.392
E2	7.90	8.30	0.311	0.327
E3	6.80	7.20	0.268	0.283
E4	0.30	0.75	0.012	0.030
e	1.15	1.25	0.045	0.049
L	1.35	1.85	0.053	0.073
L1	0.95	1.35	0.037	0.053
L2	0.40	0.80	0.016	0.031
L3	0.60	0.85	0.024	0.033
θ	7°	12°	7°	12°
P	2.90	3.10	0.114	0.122
Q	4.50	4.70	0.177	0.185
Q1	5.10	5.30	0.201	0.209
H	11.55	11.95	0.455	0.470

