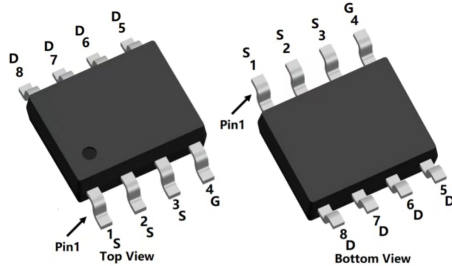


Product Summary

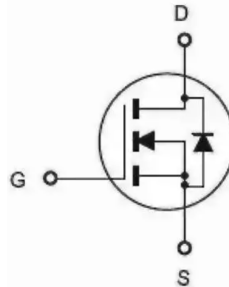
V_{DS} (V)	$R_{DS(on),max}$ (mΩ)	I_D (A)
100	19 @ $V_{GS} = 10V$	12

View and Internal Schematic Diagram



NOTE:
 LOGO - GS
 GMS190N10B Part number code
 F - Fab location code
 A - Assembly location code
 Y - Year code
 WW - Week code
 L&T - Assembly lot code

Equivalent circuit



Features

- Low $R_{DS(on)}$ trench technology
- Low thermal impedance
- Fast switching speed
- 100% avalanche tested

Application

- Power Management
- High frequency switching, synchronous rectification
- Motor Driving and BMS in Power Tools, E-vehicle
- Load switching

Absolute maximum rating@25°C

Symbol	Parameter	Value	Unit
VDS	Drain-Source Voltage ($V_{GS}=0V$)	100	V
VGS	Gate-Source Voltage ($V_{DS}=0V$)	±20	V
ID	Drain Current-Continuous ($T_A=25^\circ C$) (Note 1)	12	A
	Drain Current-Continuous ($T_A=100^\circ C$)	8	A
IDM (pulse)	Drain Current-Continuous@ Current-Pulsed (Note 2)	48	A
PD	Maximum Power Dissipation ($T_A=25^\circ C$)	2.5	w
	Maximum Power Dissipation ($T_A=100^\circ C$)	1.0	w
EAS	Avalanche energy (Note 3)	56	mJ
TJ, TSTG	Operating Junction and Storage Temperature Range	-55 To 150	°C

Thermal Characteristic

Symbol	Parameter	Typ	Max	Unit
RθJA	Thermal Resistance Junction-ambient (Steady State) ¹	--	50	°C/W

Electrical Characteristics (T_J=25℃ unless otherwise noted)

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
On/Off States						
BVDSS	Drain-Source Breakdown Voltage	VGS=0V ID=250μA	100	--	--	V
IDSS	Zero Gate Voltage Drain Current	VDS=100V,VGS=0V	--	--	1	μA
IGSS	Gate-Body Leakage Current	VGS=±20V,VDS=0V	--	--	±100	nA
VGS(th)	Gate Threshold Voltage	VDS=VGS,ID=250μA	1.2	1.7	25	V
gFS	Forward Transconductance	VDS=5V,ID=8A	--	12	--	S
RDS(on)	Drain-Source On-State Resistance	VGS=10V, ID=12A	--	16	19	mΩ
		VGS=4.5V, ID=8A	--	21	26	mΩ
Dynamic Characteristics						
Ciss	Input Capacitance	VDS=50V,VGS=0V, F=1MHZ	--	573	--	pF
Coss	Output Capacitance		--	166	--	pF
Crss	Reverse Transfer Capacitance		--	5.3	--	pF
Rg	Gate resistance	VGS=0V, VDS=0V,f=1.0MHz	--	4.5	--	Ω
Switching Times						
td(on)	Turn-on Delay Time	VGS=10V,VDS=50V, ID=10A,RGEN=4Ω	--	13	--	nS
tr	Turn-on Rise Time		--	16	--	nS
td(off)	Turn-Off Delay Time		--	23	--	nS
tf	Turn-Off Fall Time		--	6	--	nS
Qg	Total Gate Charge	VGS=10V, VDS=50V, ID=10A	--	12.5	--	nC
Qgs	Gate-Source Charge		--	1.9	--	nC
Qgd	Gate-Drain Charge		--	3.0	--	nC
Source-Drain Diode Characteristics						
ISD	Source-Drain Current(Body Diode)		--	--	12	A
VSD	Forward on Voltage	VGS=0V,IS=12A	--	--	1.2	V
trr	Reverse Recovery Time	IF=12A , dI/dt=100A/μs ,	--	43	--	ns
Qrr	Reverse Recovery Charge	TJ=25℃	--	87	--	nc

Notes 1.The maximum current rating is package limited.

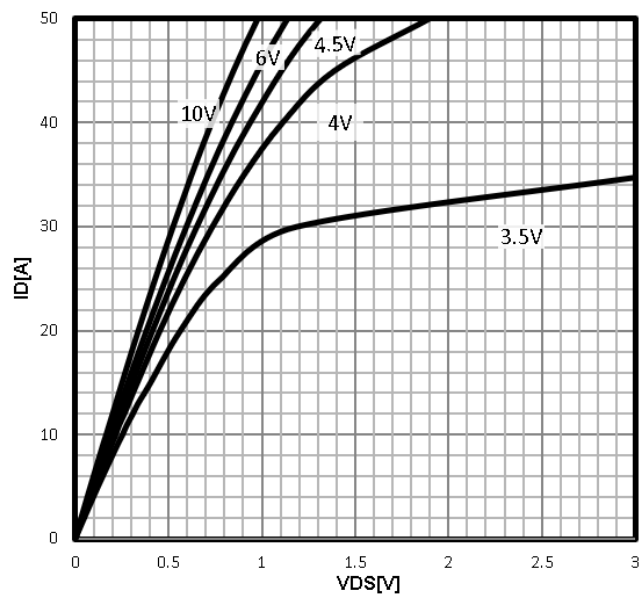
Notes 2.Repetitive Rating: Pulse width limited by maximum junction temperature

Notes 3.EAS condition: TJ=25℃, VDD=50V, Vgs=10V , ID=15A, L=0.5mH, RG=25ohm

Typical Performance Characteristics

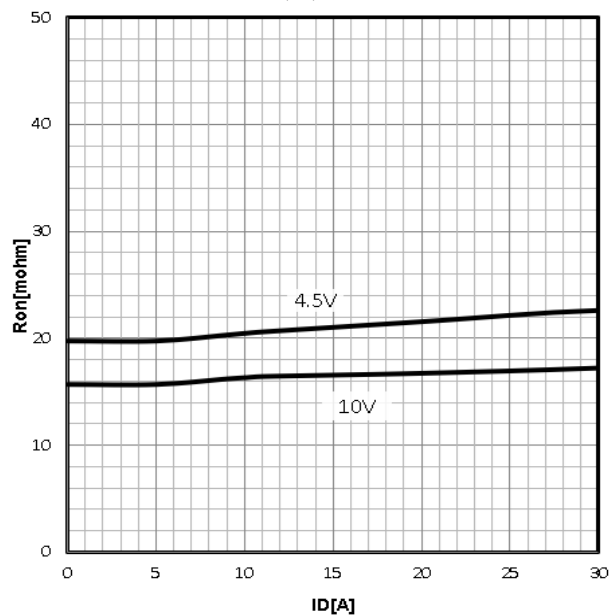
Typ. output characteristics

$$I_D = f(V_{DS})$$



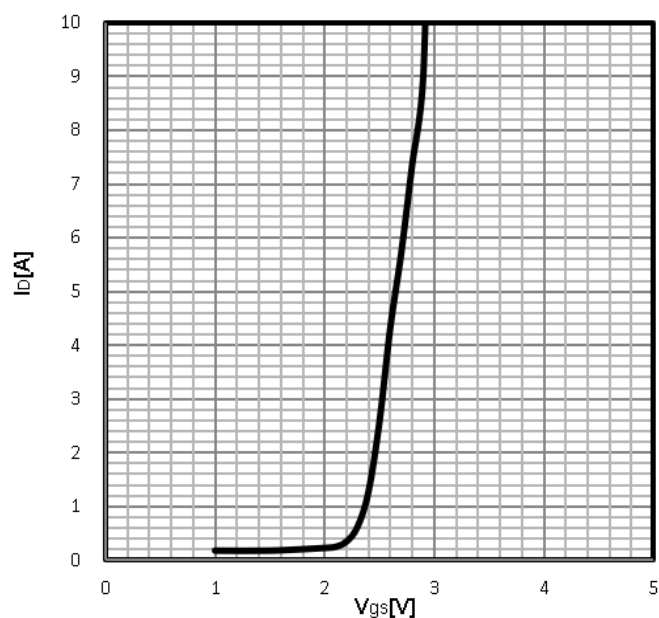
Typ. drain-source on resistance

$$R_{DS(on)} = f(I_D)$$



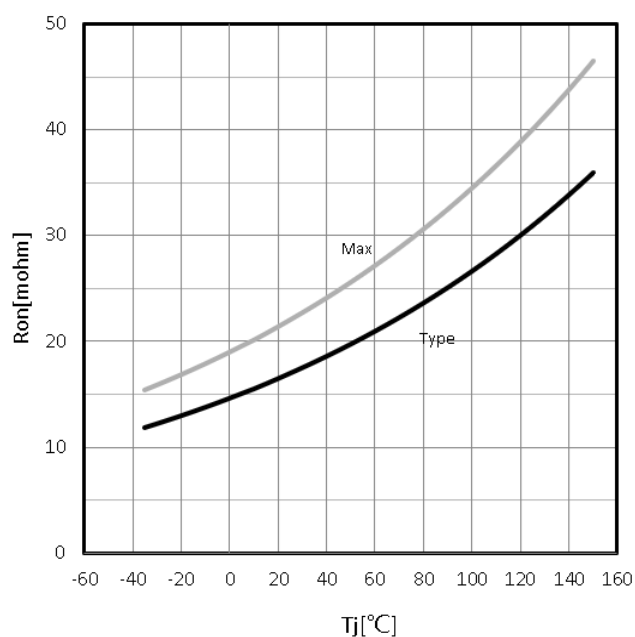
Typ. transfer characteristics

$$I_D = f(V_{GS})$$



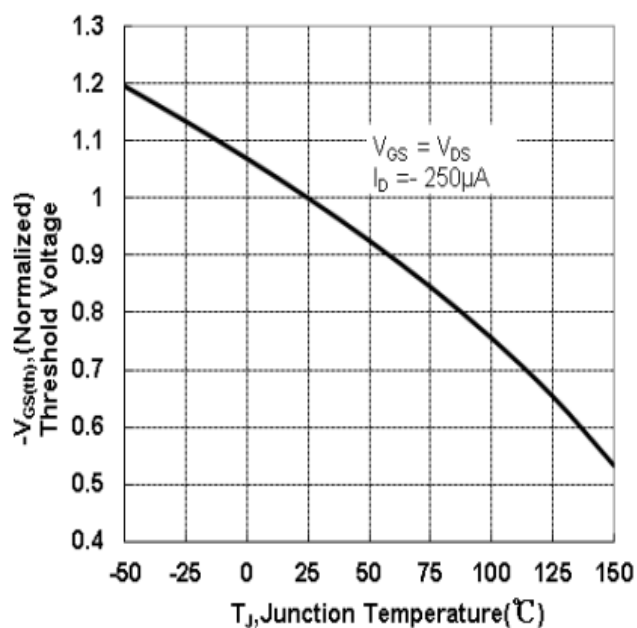
Drain-source on-state resistance

$$R_{DS(on)} = f(T_j); I_D = 10A; V_{GS} = 10V$$

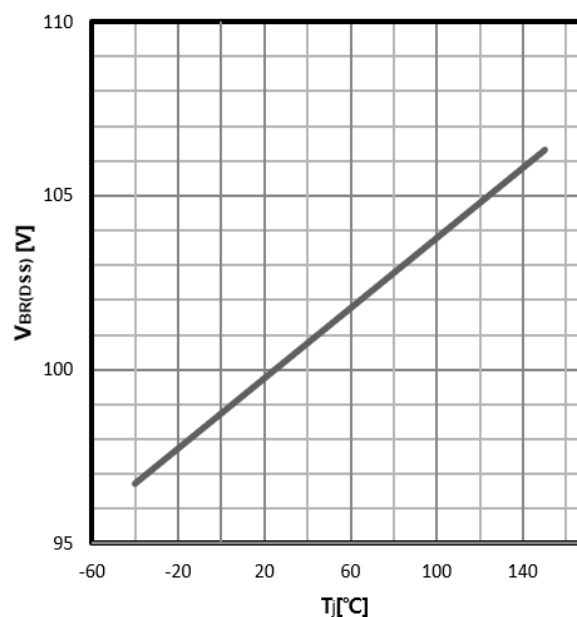


Typical Performance Characteristics

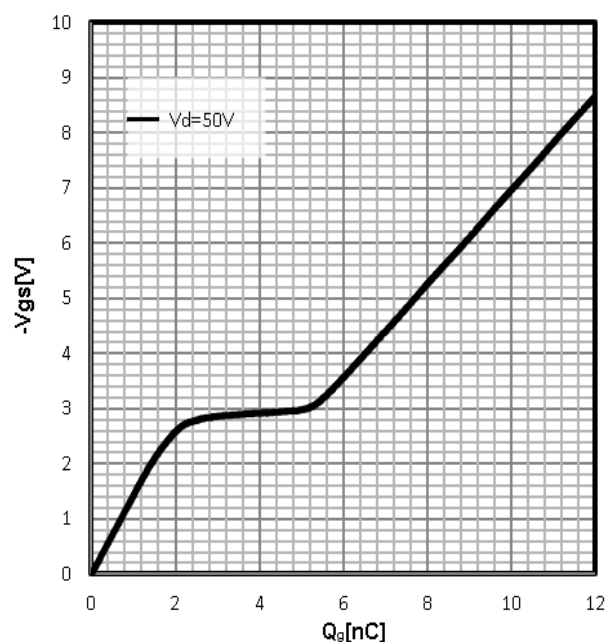
Gate Threshold Voltage
 $V_{TH}=f(T_j)$; $I_D=250\mu A$



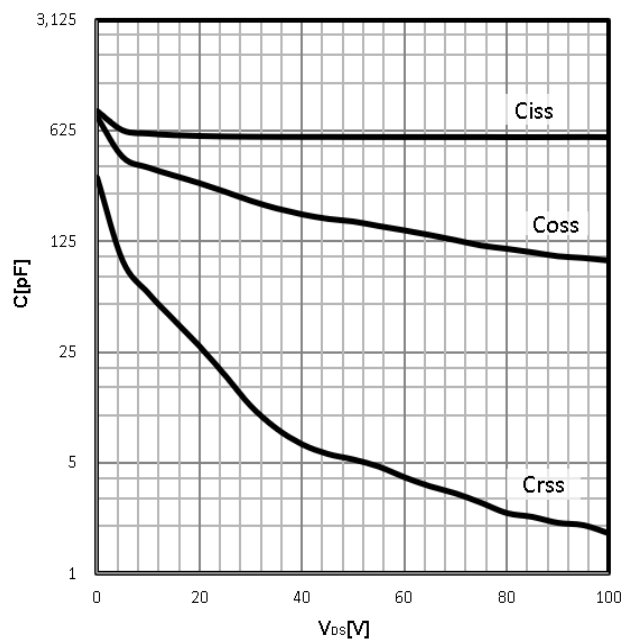
Drain-source breakdown voltage
 $V_{BR(DSS)}=f(T_j)$; $I_D=250\mu A$



Typ. gate charge
 $V_{GS}=f(Q_g)$; $I_D=10A$



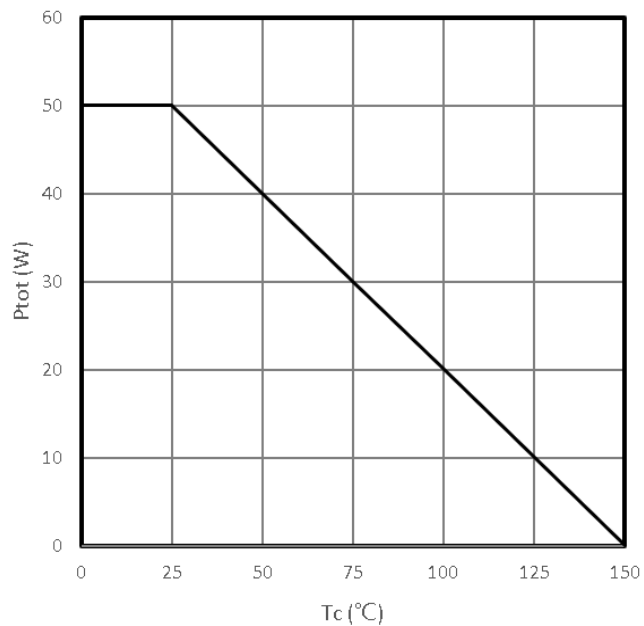
Typ. capacitances
 $C=f(V_{DS})$; $V_{GS}=0V$; $f=1MHz$



Typical Performance Characteristics

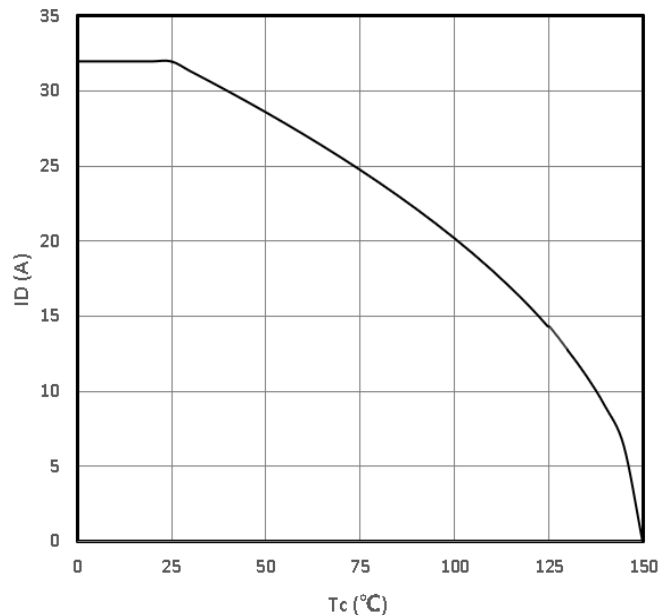
Power Dissipation

$$P_{\text{tot}} = f(T_c)$$



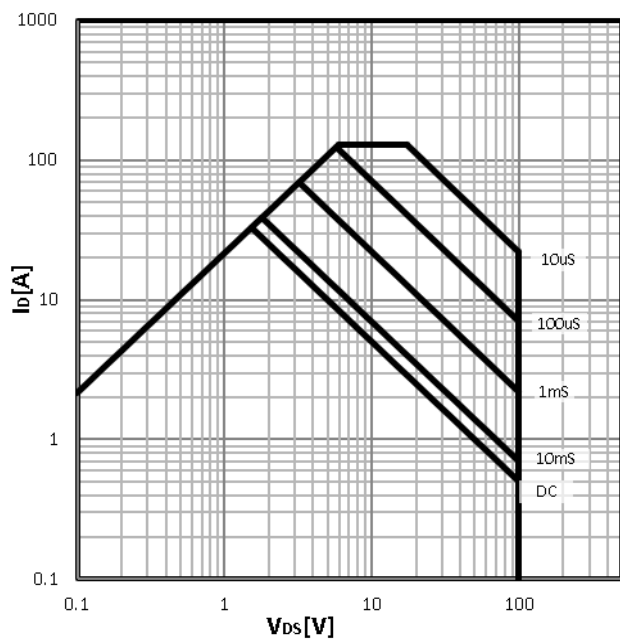
Maximum Drain Current

$$I_D = f(T_c)$$



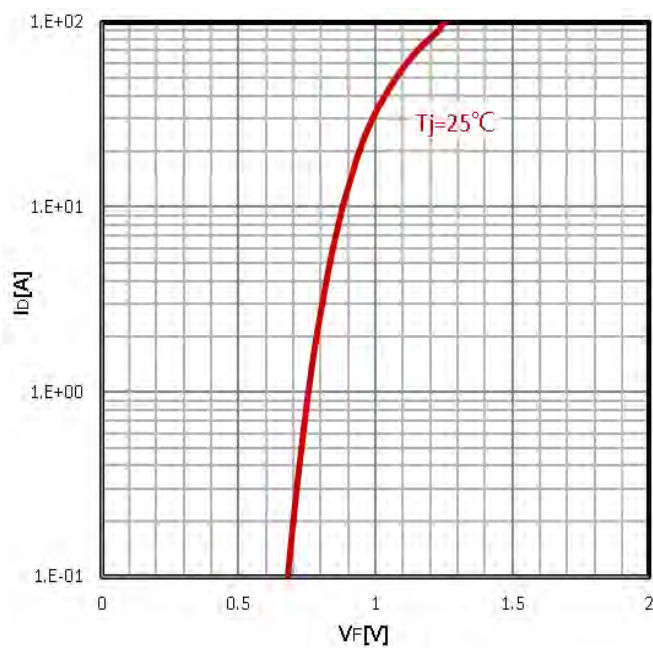
Safe operating area

$$I_D = f(V_{\text{DS}})$$



Body Diode Forward Voltage Variation

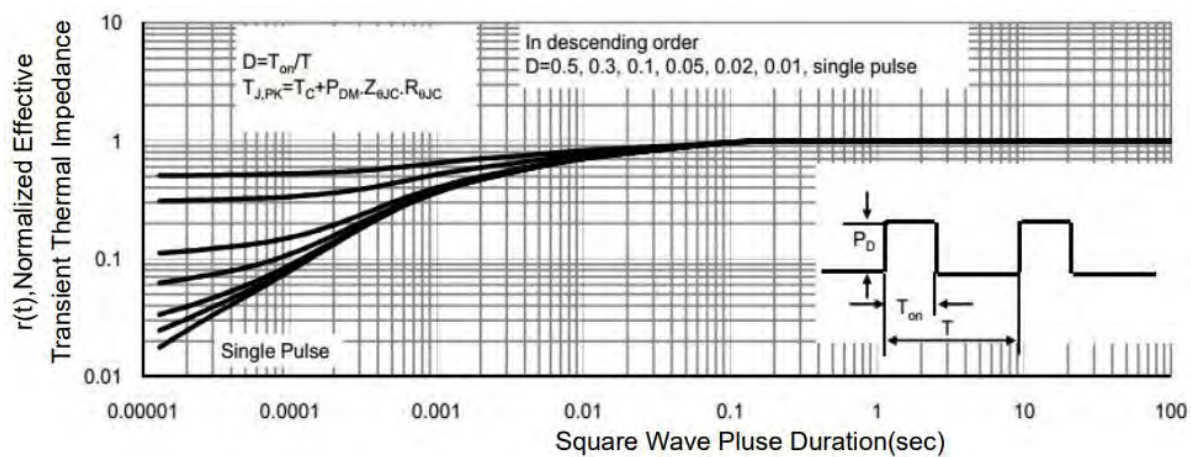
$$I_F = f(V_{\text{GS}})$$



Typical Performance Characteristics

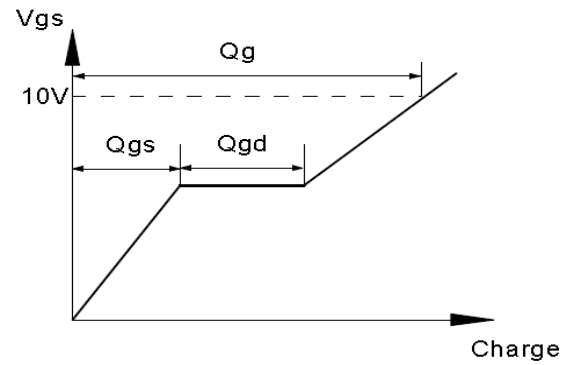
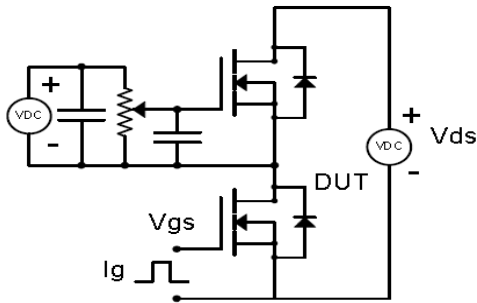
Max. transient thermal impedance

$$Z_{thJC} = f(t_p)$$

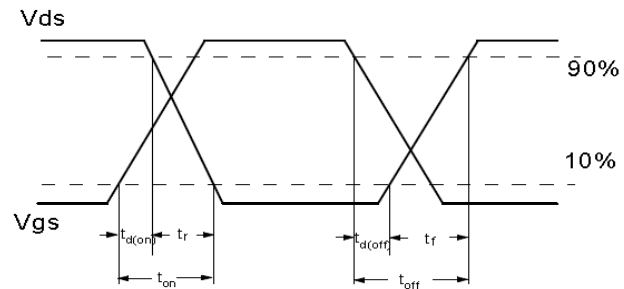
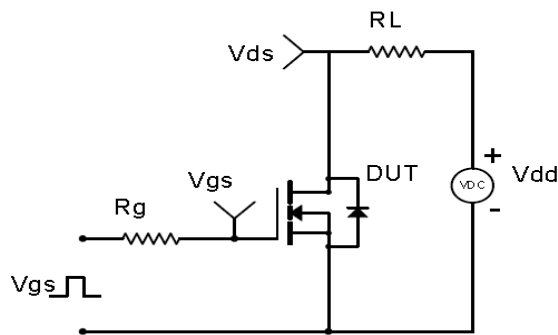


Test Circuit & Waveform

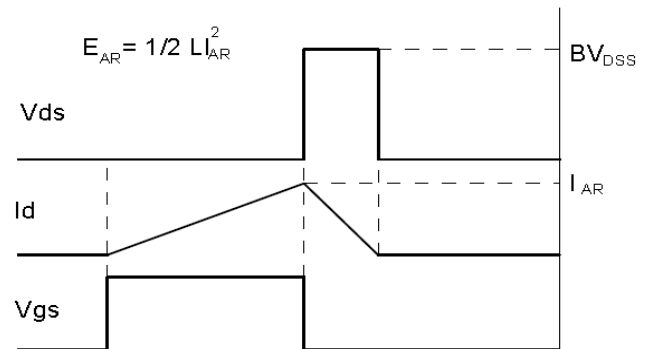
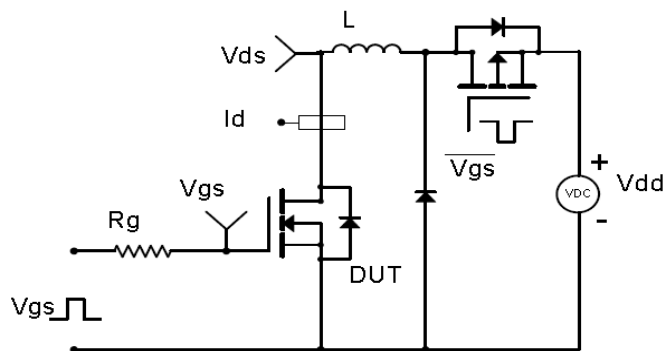
Gate Charge Test Circuit & Waveform



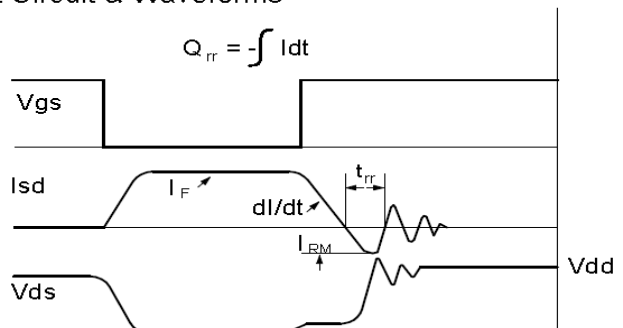
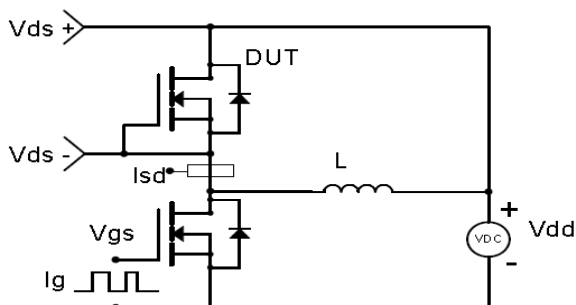
Resistive Switching Test Circuit & Waveforms



Unclamped Inductive Switching (UIS) Test Circuit & Waveforms

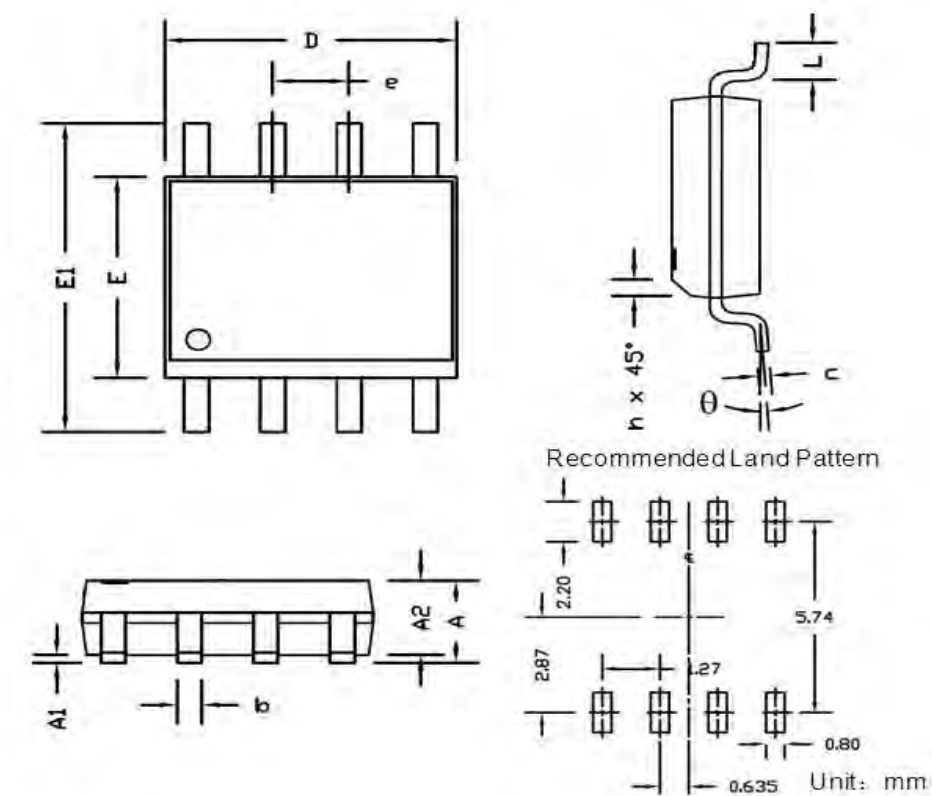


Diode Recovery Test Circuit & Waveforms



Outline Drawing SOP-8

Package Outline: SOP-8



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	1.35	1.75	0.053	0.069
A1	0.10	0.25	0.004	0.010
A2	1.25	1.65	0.049	0.065
b	0.33	0.51	0.013	0.020
c	0.17	0.25	0.007	0.010
D	4.80	5.00	0.189	0.197
e	1.27 BSC.		0.050 BSC.	
E	3.80	4.00	0.150	0.157
E1	5.80	6.20	0.228	0.244
h	0.25	0.50	0.010	0.020
L	0.40	1.27	0.016	0.050
θ	0°	8°	0°	8°

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