REASUNOS

RS60N30D

N Channel MOSFET

Pb Lead Free Package and Finish
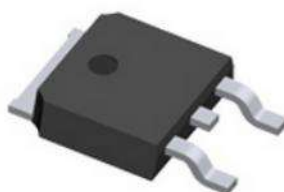
Applications：

•PWM applications

•Load switch

•Power management
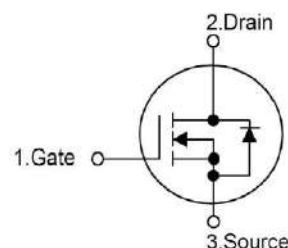
ID	RDS(ON)(Max.)	VDSS
30A	35mΩ	60V

Features：

•V_{DS}=60V; I_D=30A
  $R_{DS(ON)}$ < 35mΩ @ V_{GS} =10V
  Rds(on) < 40mΩ @ VGS =4.5V

•Ultra Low On-Resistance

•High UIS and UIS 100% Test

•RoHS Compliant

TO-252(DPAK) top view

2.Drain

1.Gate

3.Source

Ordering Information

Part Number	Package	Marking
RS60N30D	TO-252	RS60N30D

Absolute Maximun Ratings Tc=25℃ unless otherwise specified

Symbol	Parameter	RS60N30D	Units
VDSS	Drain-to-Source Voltage	60	V
ID	Continuous Drain Current（Tc=25℃）	30	A
	Continuous Drain Current Tc=100℃	14	
IDM	Pulsed Drain Current (Note*1)	60	
PD	Power Dissipation（Tc=25℃）	45	W
VGS	Gate-to-Source Voltage	±20	V
EAS	Single Pulse Avalanche Engergy (Note*2)	72	mJ
TL TPKG	Maximum Temperature for Soldering	300 260	℃
	Leads at 0.063in(1.6mm)from Case for 10 seconds		
	Package Body for 10 seconds		
TJ and TSTG	Operating Junction and Storage Temperature Range	-55 to 175	

*Drain Current Limited by Maximum Junction Temperature

Caution:Stresses greater than those listed in the"Absolute Maximum Ratings"Table may cause permanent damage to the device.

Thermal Resistance

Symbol	Parameter	RS60N30D	Units	Test Conditions
RθJC	Junction-to-Case	3.3	℃/W	Drain lead soldered to water cooled heatsink,PD adjusted for a peak junction temperature of +175℃.

OFF Characteristics TJ=25℃ unless otherwise specified

Symbol	Parameter	Min.	Typ.	Max.	Units	Test Conditions
BVDSS	Drain-to-source Breakdown Voltage	60	--	--	V	VGS=0V,ID=250μA
IDSS	Drain-to-Source Leakage Current	--	--	1	μA	VDS=60V,VGS=0V
IGSS	Gate-to-Source Forward Leakage	--	--	100	nA	VGS=+20V VDS=0V
	Gate-to-Source Reverse Leakage	--	--	-100		VGS=-20V VDS=0V

ON Characteristics TJ=25℃ unless otherwise specified

Symbol	Parameter	Min.	Typ.	Max.	Units	Test Conditions
RDS(on)	Static Drain-to-Source On-Resistance (Note*3)	--	22.0	35.0	mΩ	VGS=10V,ID=20A
		--	26.0	40.0	mΩ	VGS=4.5V,ID=10A
VGS(TH)	Gate Threshold Voltage	1.2	1.5	2.5	V	VGS=VDS,ID=250μA

Resistive Switching Characteristics Essentially independent of operating temperature

Symbol	Parameter	Min.	Typ.	Max.	Units	Test Conditions
td(ON)	Turn-on Delay Time	--	5	--	nS	VDS=30V VGS=10V ID=2A RG=3Ω RL=6.7OΩ
trise	Rise Time	--	2.6	--		
td(OFF)	Turn-OFF Delay Time	--	16	--		
tfall	Fall Time	--	2.3	--		

Dynamic Characteristics Essentially independent of operating temperature

Symbol	Parameter	Min.	Typ.	Max.	Units	Test Conditions
Ciss	Input Capacitance	--	500	--	pF	VGS=0V VDS=30V f=1.0MHz
Coss	Output Capacitance	--	60	--		
Crss	Reverse Transfer Capacitance	--	25	--		
Qg	Total Gate Charge	--	47	--	nC	VDS=30V ID=4.5A VGS=10V
Qgs	Gate-to-Source Charge	--	6	--		
Qgd	Gate-to-Drain("Miller"）Charge	--	14	--		

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Source-Drain Diode Characteristics

Symbol	Parameter	Min.	Typ.	Max.	Units	Test Conditions
I_{SD}	Source-Drain Current(Body Diode)	--	--	30	A	
I_{SDM}	Pulsed Source-Drain Current(Body Diode)	--	--	20	A	Maximum Pulsed Drain to Source Diode Forward Current
V_{SD}	Diode Forward Voltage	--	--	1.2	V	IS=20A,VGS=0V
trr	Reverse Recovery Time	--	35	--	nS	VGS=0V
Qrr	Reverse Recovery Charge	--	53	--	nC	IF=20A,di/dt=100A/µs

Notes:

*1. Repetitive Rating: Pulse Width Limited by Maximum Junction Temperature
*2. EAS condition: TJ=25℃, VDD=30V, VG=10V, L=0.5mH, RG=25Ω
*3. Pulse Test: Pulse Width≤300µs, Duty Cycle≤0.5%

Typical Electrical and Thermal Characteristics (Curves)
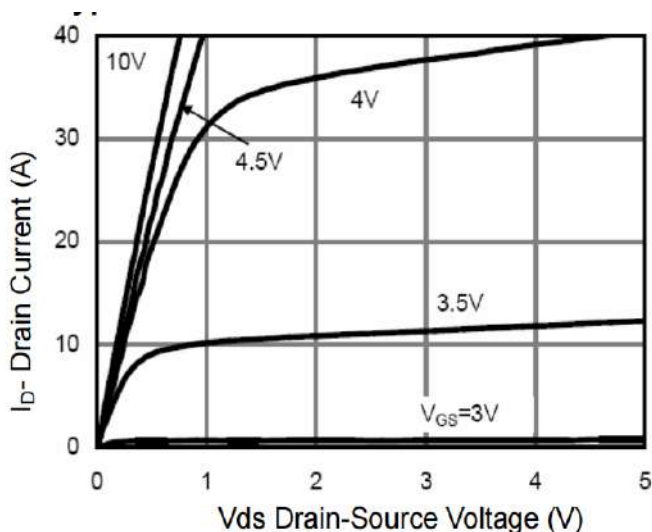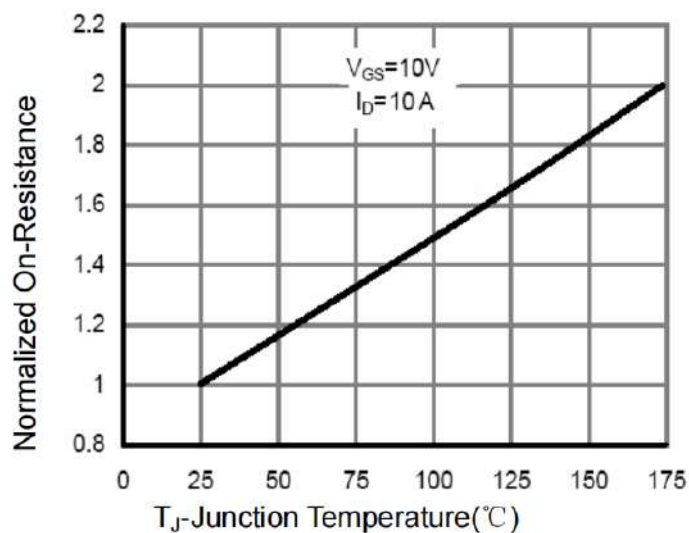

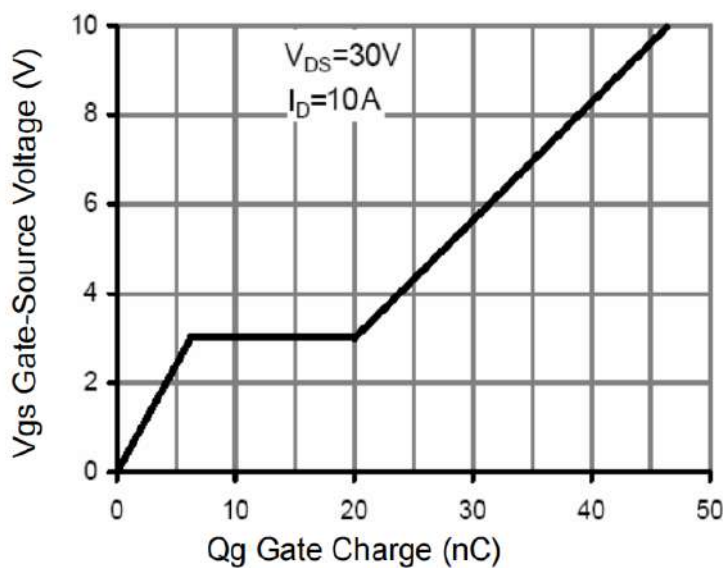
Figure 1 Output Characteristics
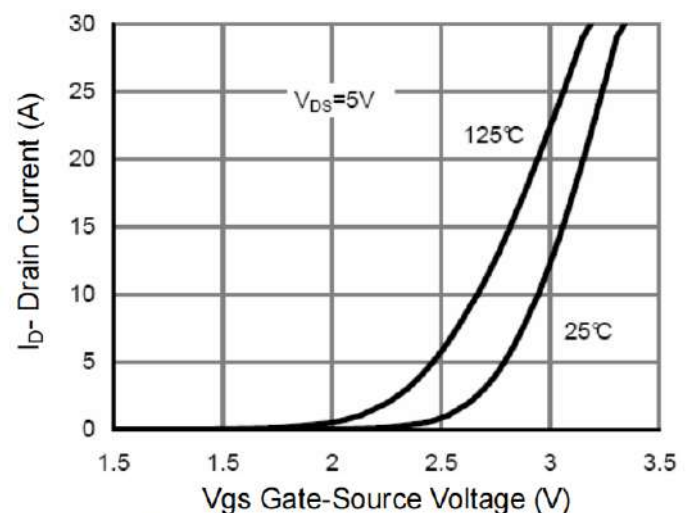
Figure 2 Transfer Characteristics
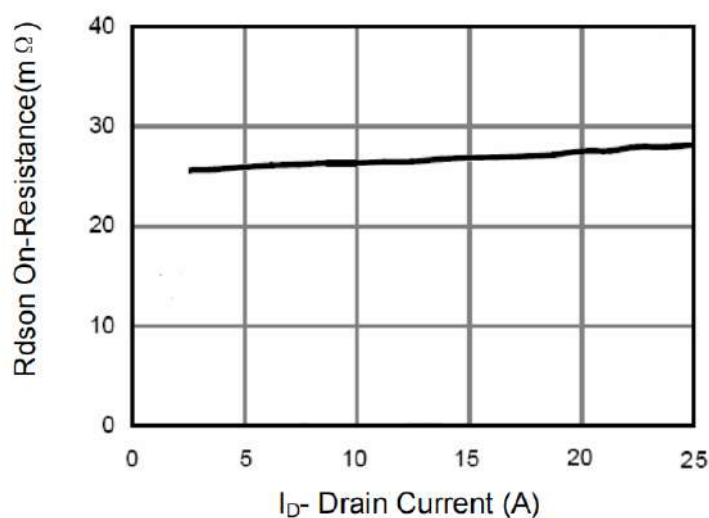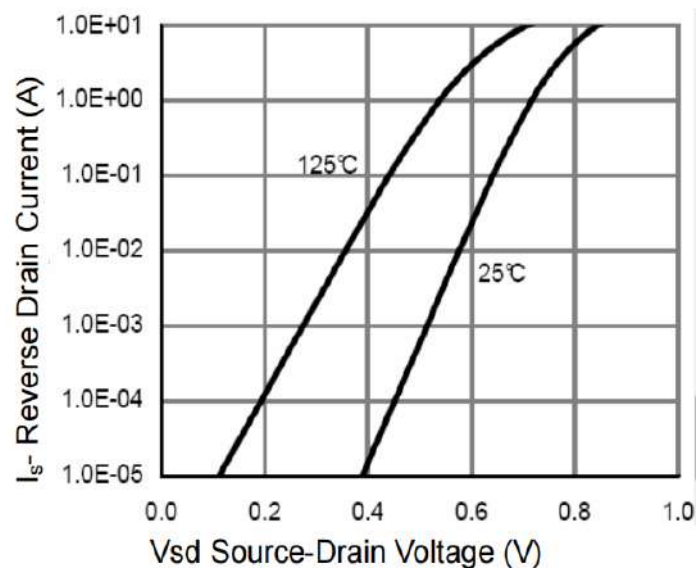
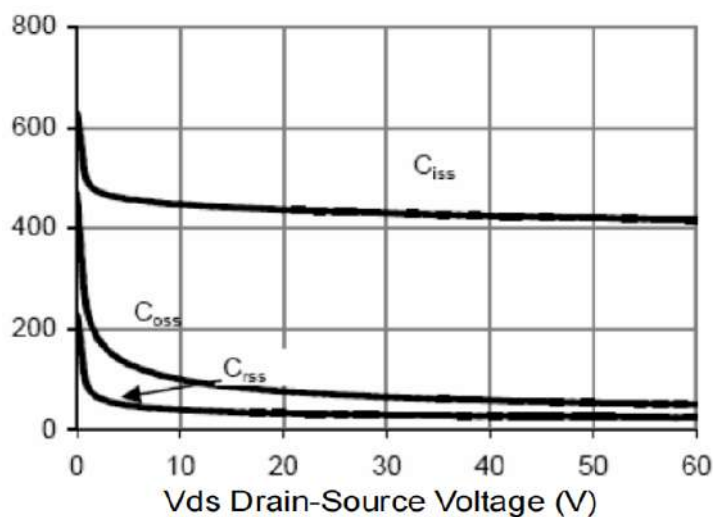**Figure 3 Rdson- Drain Current**

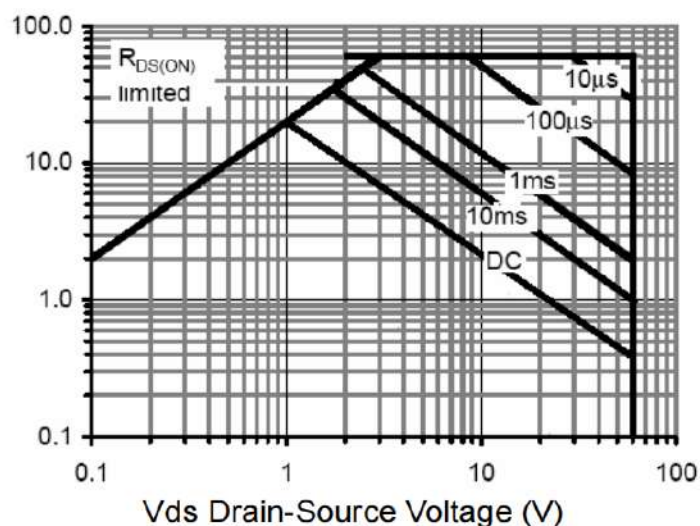**Figure 4 Rdson-Junction Temperature**

Figure 5 Gate Charge

Figure 6 Source- Drain Diode Forward

Figure 7 Capacitance vs Vds
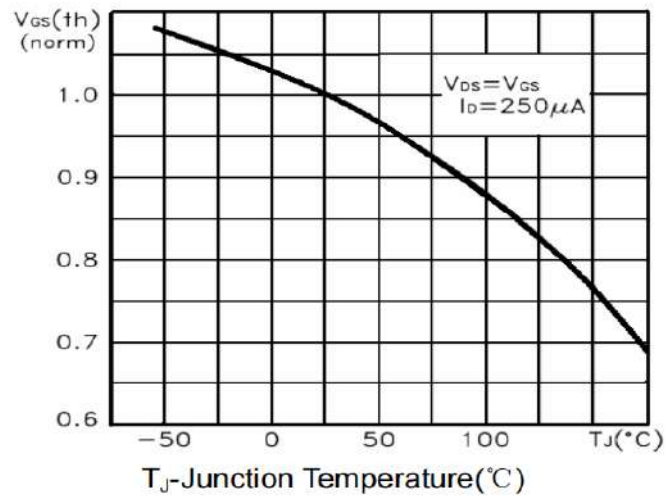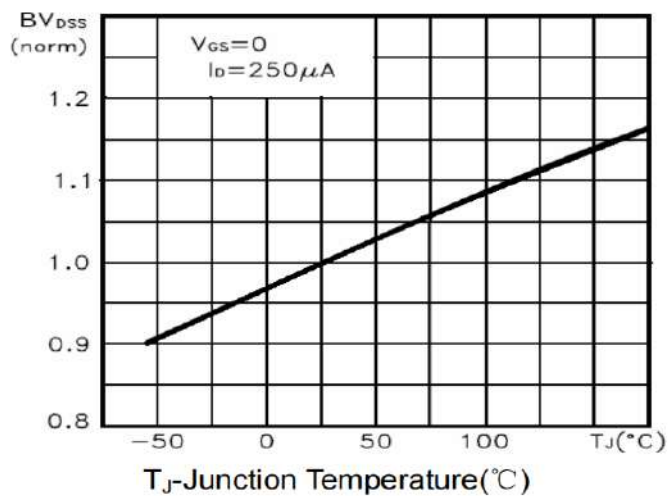

Figure 8 Safe Operation Area

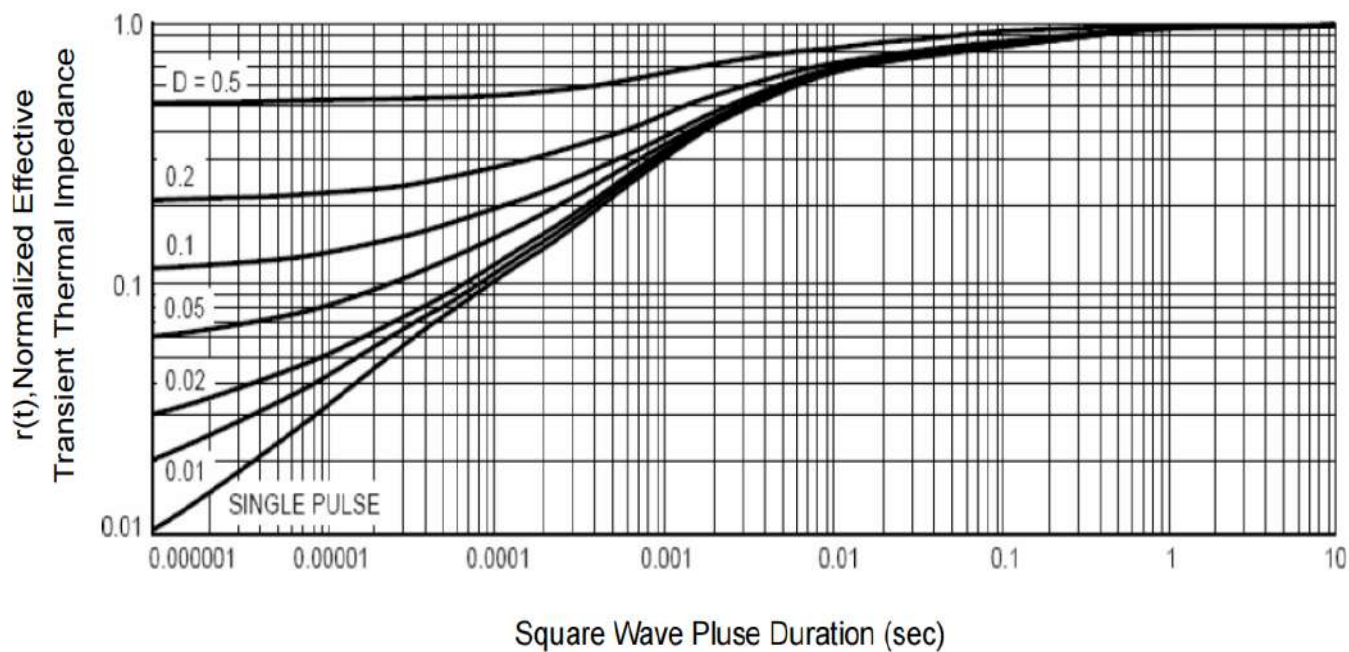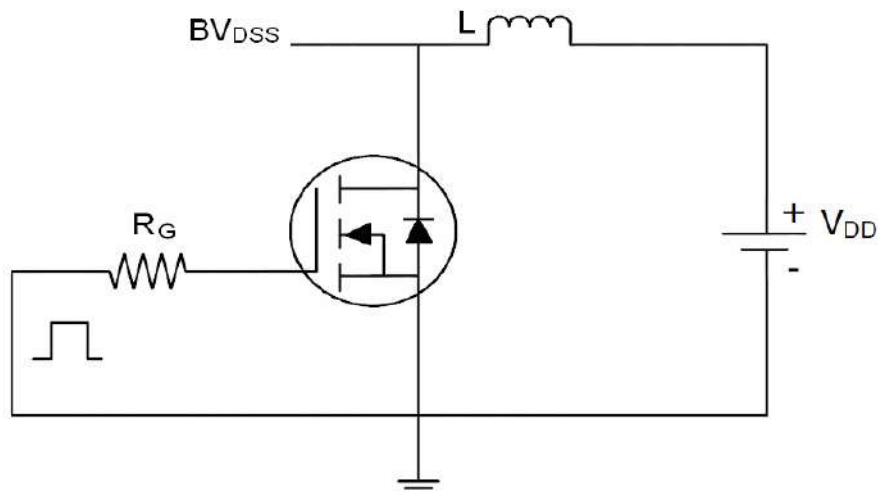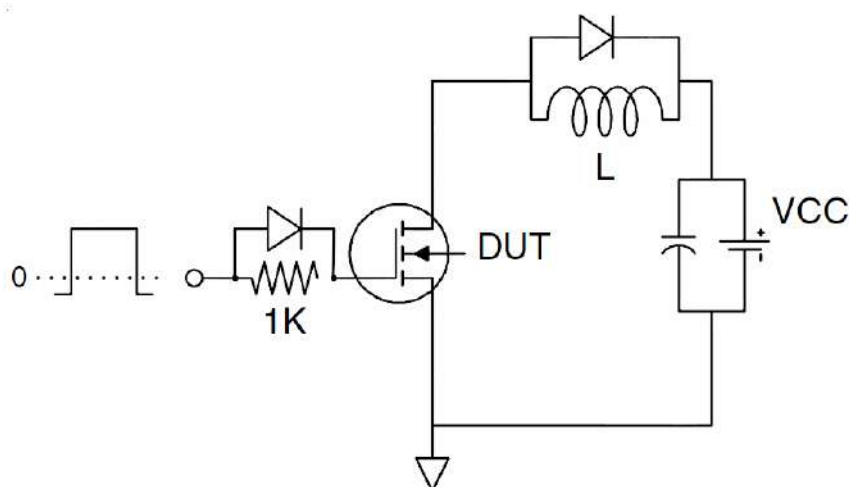Figure 9 BV$_{DSS}$ vs Junction Temperature   Figure 10 V$_{GS(th)}$ vs Junction Temperature

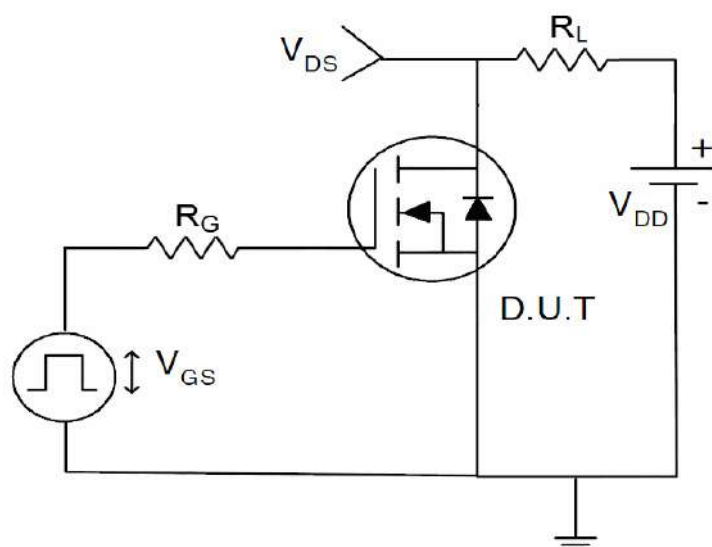Figure 11 Normalized Maximum Transient Thermal Impedance

Test Circuit
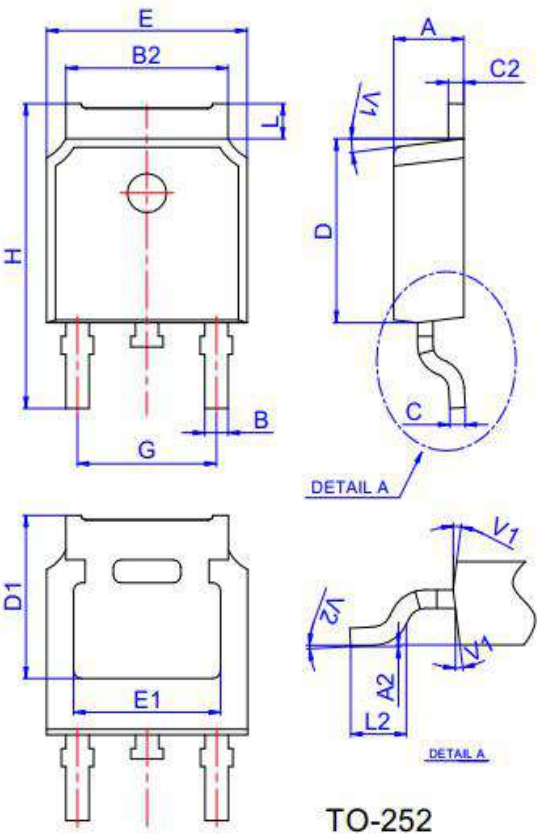
1) EAS test Circuit

2) Gate charge test Circuit

3) Switch Time Test Circuit

Package outline drawing

TO-252

Ref.	Dimensions					
	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A	2.10		2.50	0.083		0.098
A2	0		0.10	0		0.004
B	0.66		0.86	0.026		0.034
B2	5.18		5.48	0.202		0.216
C	0.40		0.60	0.016		0.024
C2	0.44		0.58	0.017		0.023
D	5.90		6.30	0.232		0.248
D1		5.30REF			0.209REF	
E	6.40		6.80	0.252		0.268
E1	4.63			0.182		
G	4.47		4.67	0.176		0.184
H	9.50		10.70	0.374		0.421
L	1.09		1.21	0.043		0.048
L2	1.35		1.65	0.053		0.065
V1		7°			7°	
V2	0°		6°	0°		6°

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     c.whose failuer to when properly used in accordance with instructions for used provided
      in the laeling,can be reasonably expected to result in significant injury to the user.

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    system whose failure to perform can be reasonably expected to cause the failure of the life
    support device or system,or to affect its safety or effectiveness.