

### ● General Description

The AGM6N20D combines advanced trench MOSFET technology with a low resistance package to provide extremely low  $R_{DS(ON)}$ . This device is ideal for load switch and battery protection applications.

### ● Features

- Fast Switching
- ESD Improved Capability
- Low Gate Charge
- Low Reverse transfer capacitances

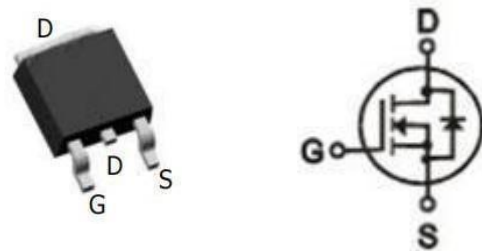
### ● Applications

- Power switch circuit of POWER
- Uninterruptible Power Supply(UPS)
- Power Factor Correction(PFC)

### Product Summary

BVDSS	RDSON	ID
200V	500mΩ	7.0A

### TO- 252 Pin Configuration



### Package Marking and Ordering Information

Device Marking	Device	Device Package	Reel Size	Tape width	Quantity
AGM6N20D	AGM6N20D	TO-252	330mm	16mm	2500

**Table 1. Absolute Maximum Ratings (TA=25°C)**

Symbol	Parameter	Value	Unit
VDS	Drain-Source Voltage (VGS=0V)	200	V
VGS	Gate-Source Voltage (VDS=0V)	±20	V
ID	Drain Current-Continuous(Tc=25°C) <b>(Note 1)</b>	7.0	A
	Drain Current-Continuous(Tc=100°C)	4.2	A
IDM (pluse)	Drain Current-Continuous@ Current-Pulsed <b>(Note 2)</b>	28	A
PD	Maximum Power Dissipation(Tc=25°C)	62.5	w
	Maximum Power Dissipation(Tc=100°C)	25	w
TJ,TSTG	Operating Junction and Storage Temperature Range	-55 To 150	°C

**Table 2. Thermal Characteristic**

Symbol	Parameter	Typ	Max	Unit
RθJA	Thermal Resistance Junction-ambient (Steady State) <sup>1</sup>	---	42	°C/W
RθJC	Thermal Resistance Junction-Case <sup>1</sup>	---	2.0	°C/W

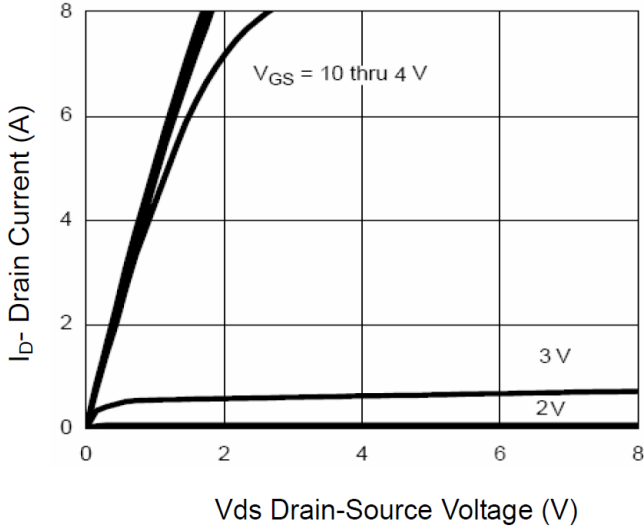
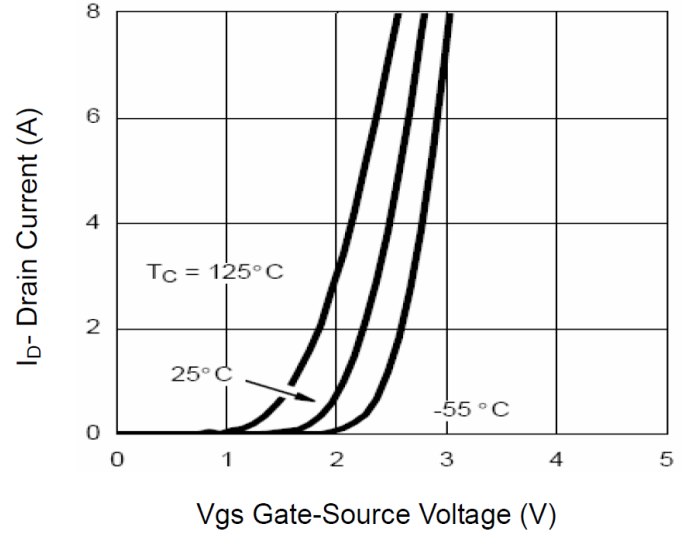
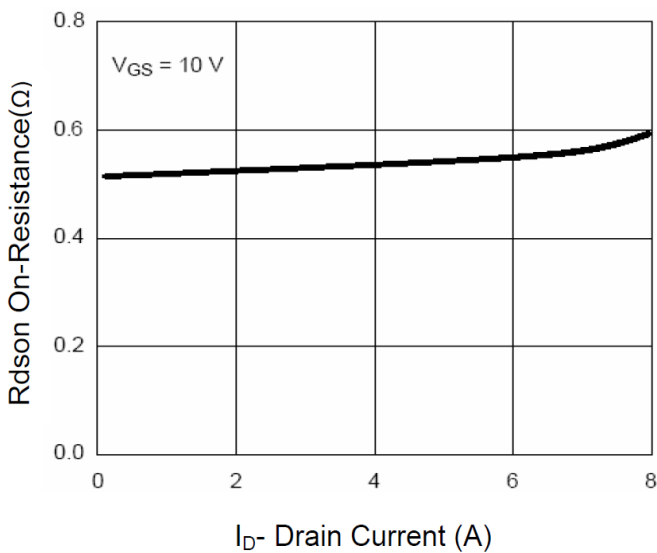
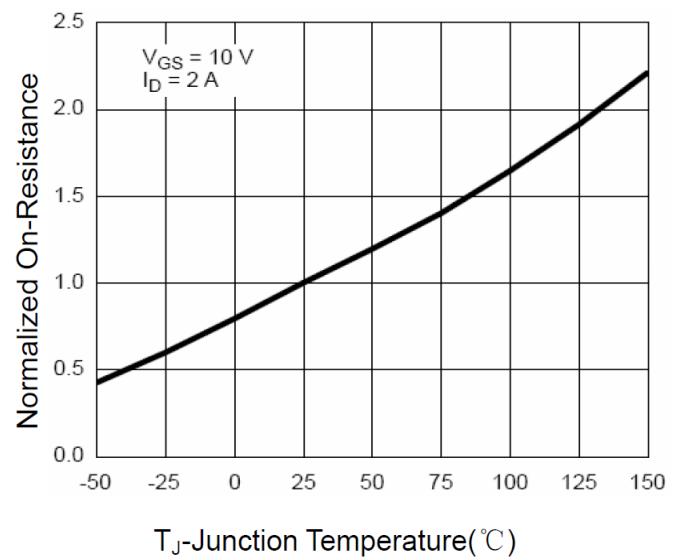
**Table 3. Electrical Characteristics (T<sub>J</sub>=25°C unless otherwise noted)**

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
<b>On/Off States</b>						
BVDSS	Drain-Source Breakdown Voltage	VGS=0V ID=250μA	200	--	--	V
IDSS	Zero Gate Voltage Drain Current	VDS=200V,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	--	2.1	V
gFS	Forward Transconductance	VDS=5V,ID=3A	--	8	--	S
RDS(on)	Drain-Source On-State Resistance	VGS=10V, ID=4A	--	500	580	mΩ
		VGS=4.5V, ID=3A		460	540	mΩ
<b>Dynamic Characteristics</b>						
Ciss	Input Capacitance	VDS=25V,VGS=0V, F=1MHZ	--	580	--	pF
Coss	Output Capacitance		--	90	--	pF
Crss	Reverse Transfer Capacitance		--	3.0	--	pF
Rg	Gate resistance	VGS=0V, VDS=0V,f=1.0MHz	--	2.0	--	Ω
<b>Switching Times</b>						
td(on)	Turn-on Delay Time	VGS=10V,VDS=100V ID=2A,RGEN=2.5Ω	--	10	--	nS
tr	Turn-on Rise Time		--	12	--	nS
td(off)	Turn-Off Delay Time		--	15	--	nS
tf	Turn-Off Fall Time		--	15	--	nS
Qg	Total Gate Charge		--	12	--	nC
Qgs	Gate-Source Charge	VGS=10V, VDS=100V, ID=2A	--	2.5	--	nC
Qgd	Gate-Drain Charge		--	3.8	--	nC
<b>Source-Drain Diode Characteristics</b>						
ISD	Source-Drain Current(Body Diode)		--	--	7.0	A
VSD	Forward on Voltage	VGS=0V,IS=4A	--	--	1.1	V
trr	Reverse Recovery Time	Is=4A , dI/dt=100A/μs , TJ=25°C	--	50	--	ns
Qrr	Reverse Recovery Charge		--	98	--	nc

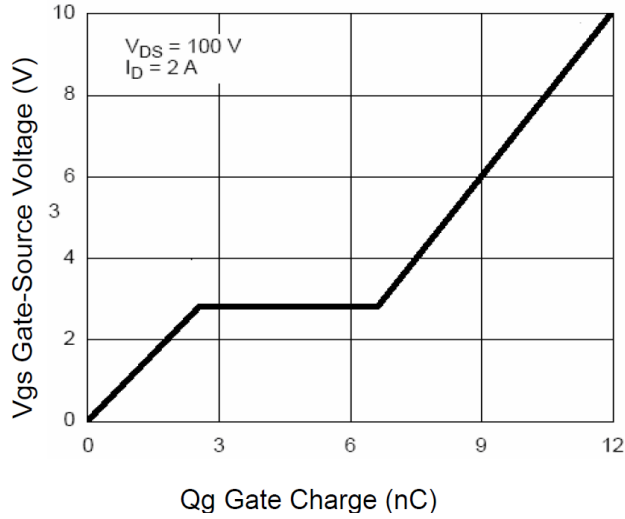
Notes 1.The maximum current rating is package limited.

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

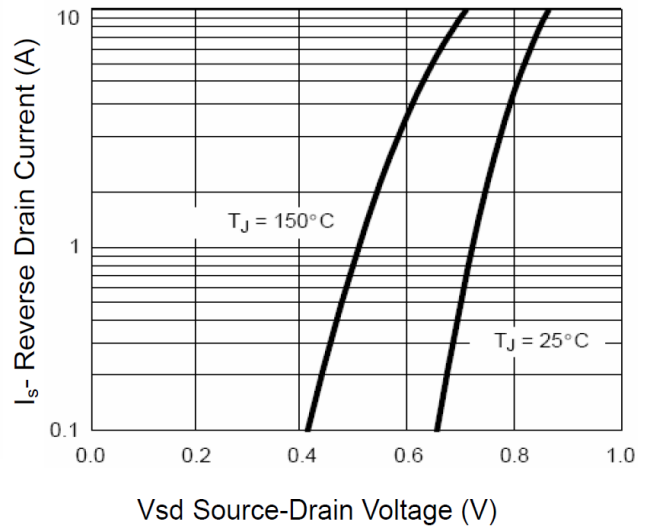
Notes 3.EAS condition: T<sub>J</sub>=25°C

**Characteristics Curve:**
**Typ. Output Characteristics**

**Transfer Characteristics**

 **$R_{dson}$ -Drain Current**

 **$R_{dson}$ -Junction Temperature**


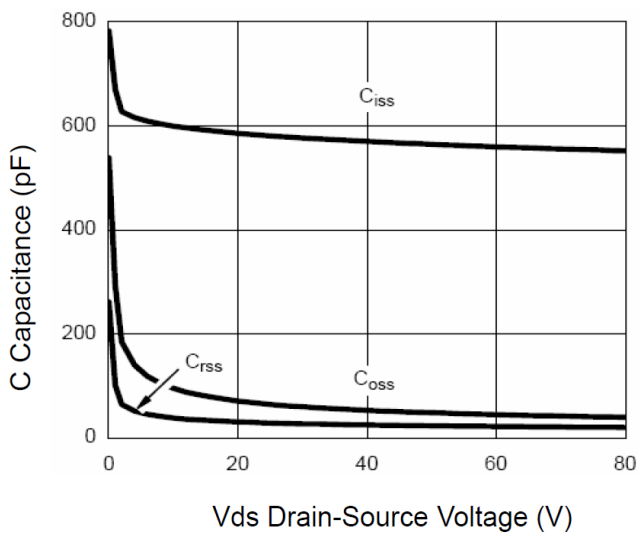
Gate Charge



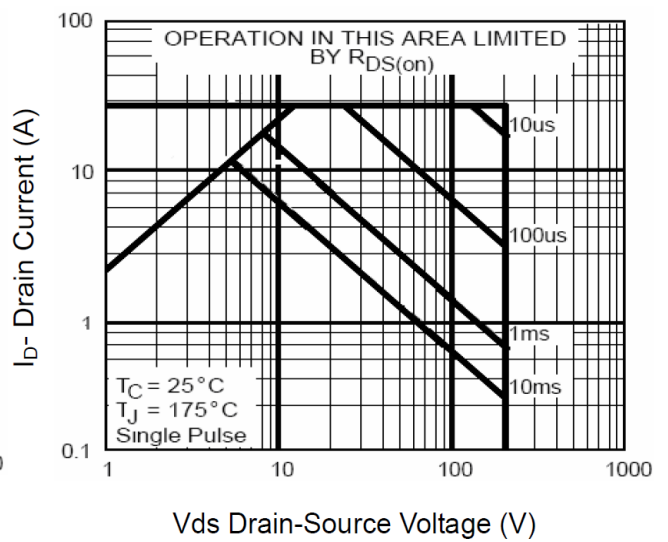
Source-Drain Diode Forward

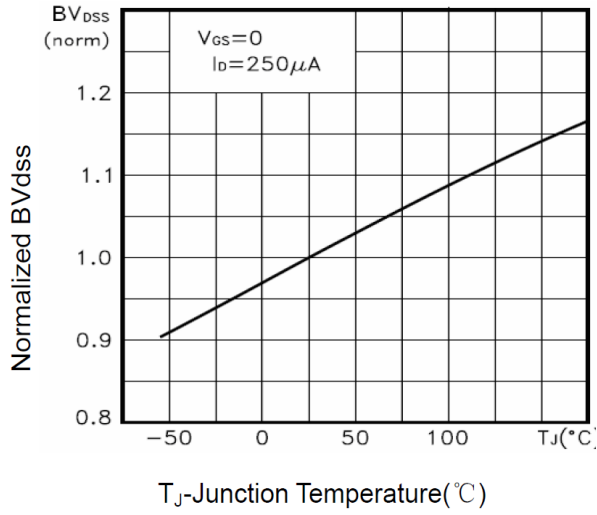
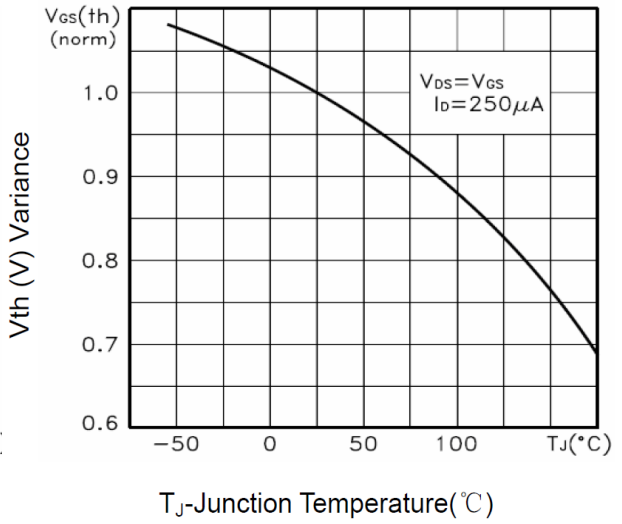
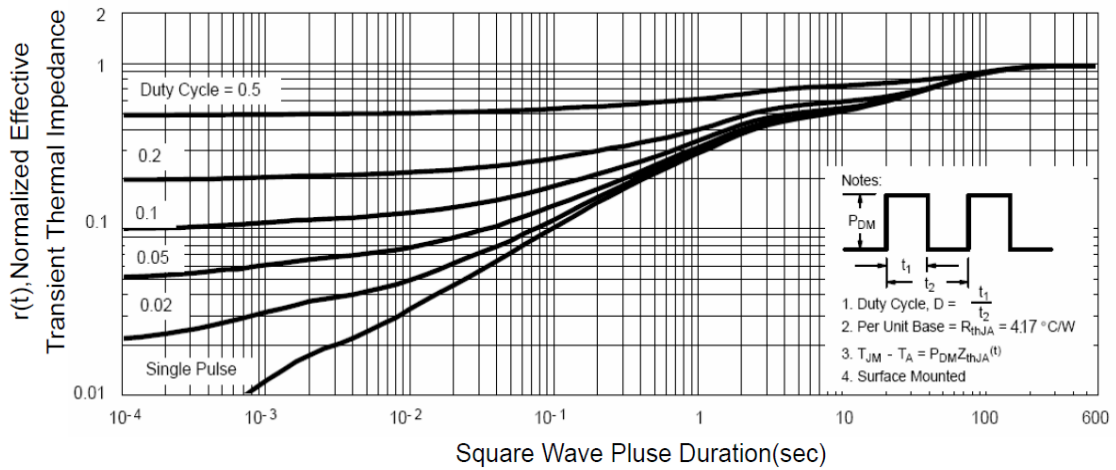


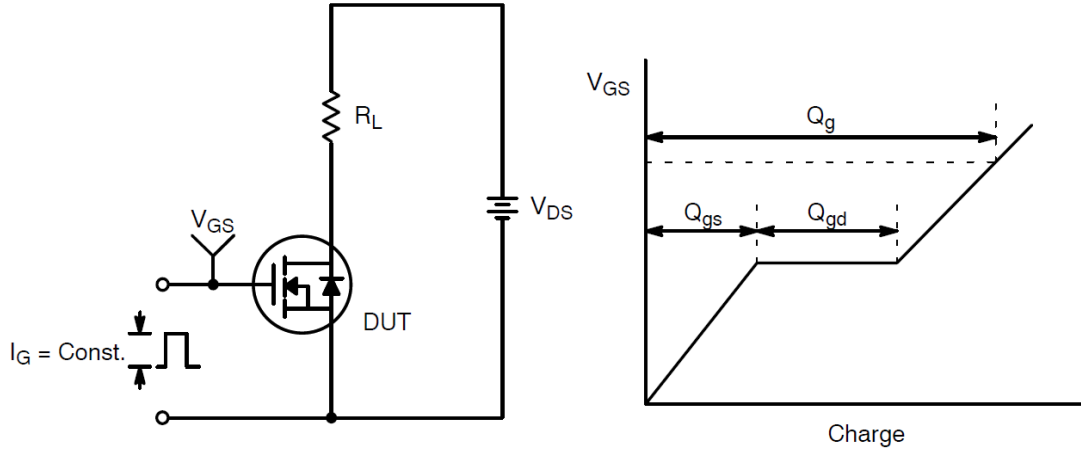
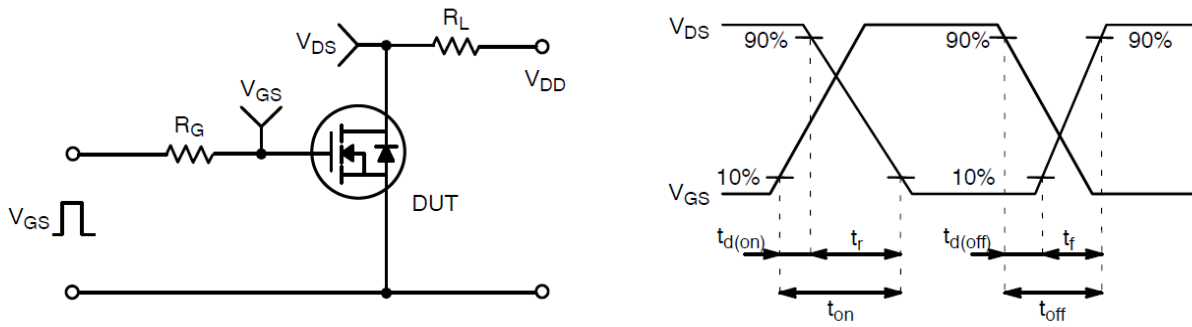
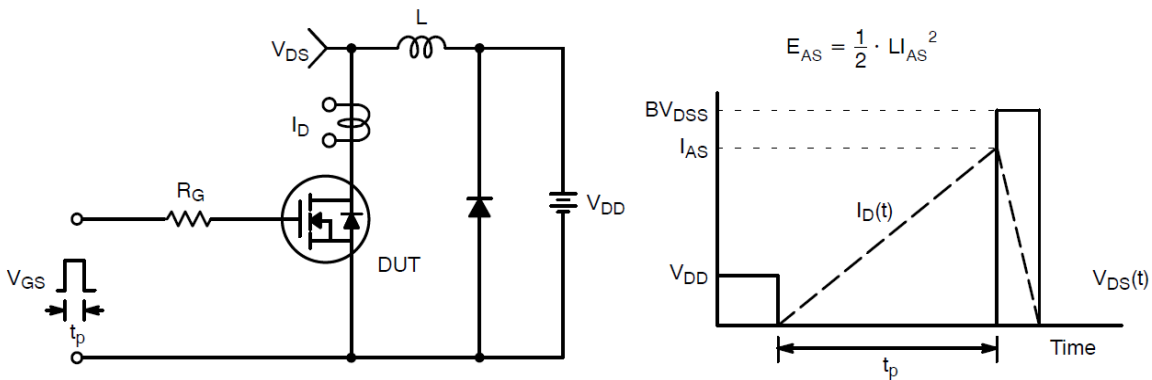
Capacitance



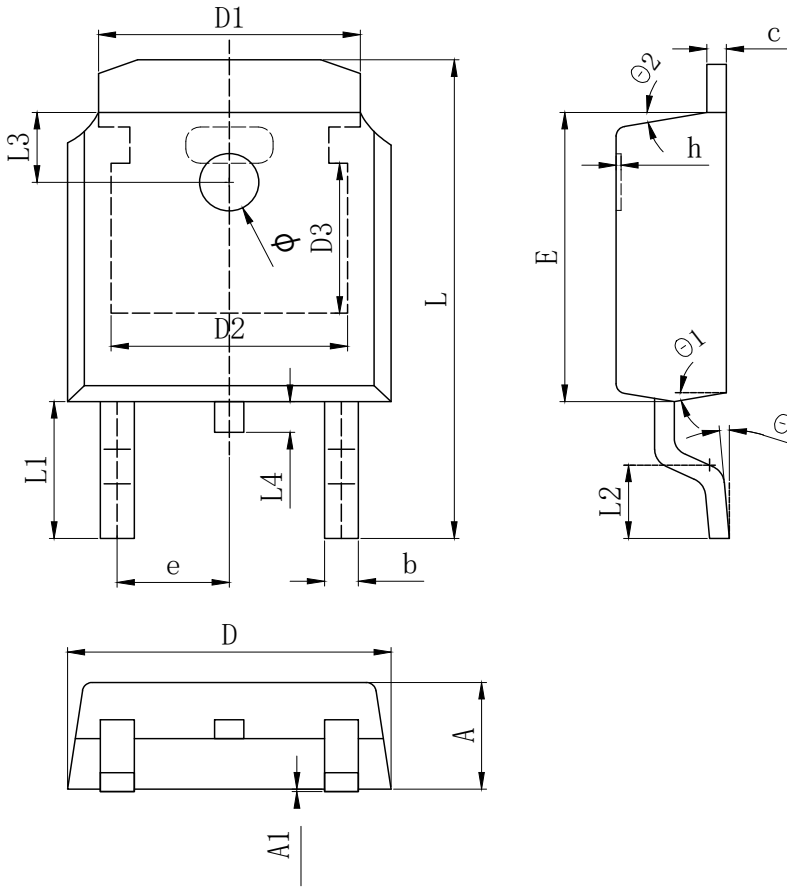
Safe Operating Area



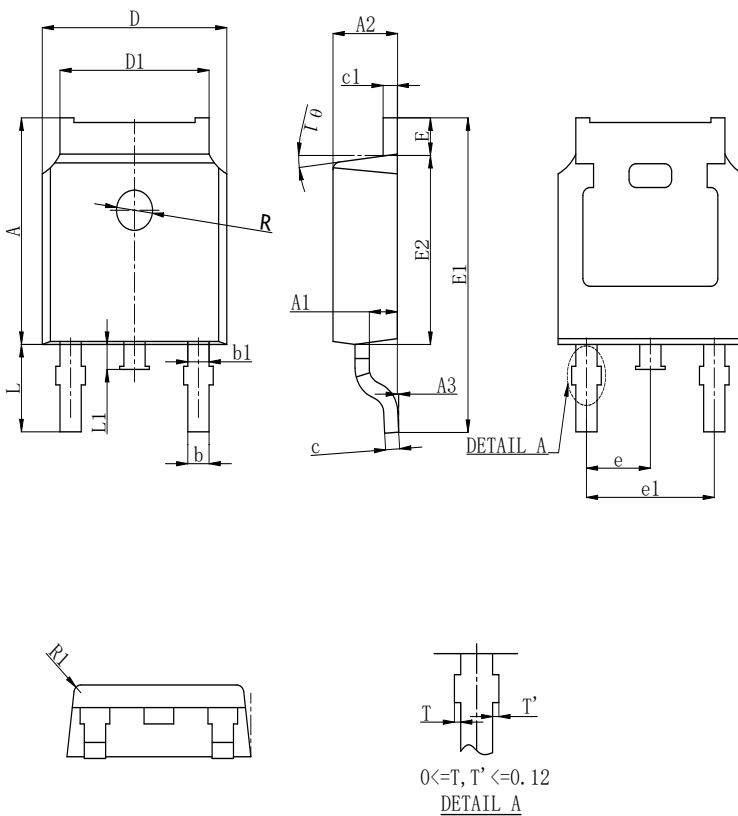
**BV<sub>DSS</sub> VS Junction Temperature**

**V<sub>GS(th)</sub> vs Junction Temperature**

**Max. transient thermal impedance**


**Test Circuit and Waveform:**

**Gate Charge Test Circuit & Waveform**

**Resistive Switching Test Circuit & Waveforms**

**Unclamped Inductive Switching Test Circuit & Waveforms**

## TO-252 Package Outline Data



SYMBOL	MILLIMETER		
	MIN	Typ.	MAX
A	2.200	2.300	2.400
A1	0.000		0.127
b	0.640	0.690	0.740
c (电镀后)	0.460	0.520	0.580
D	6.500	6.600	6.700
D1	5.334 REF		
D2	4.826 REF		
D3	3.166 REF		
E	6.000	6.100	6.200
e	2.286 TYP		
h	0.000	0.100	0.200
L	9.900	10.100	10.300
L1	2.888 REF		
L2	1.400	1.550	1.700
L3	1.600 REF		
L4	0.600	0.800	1.000
$\Phi$	1.100	1.200	1.300
$\theta$	0°		8°
$\theta_1$	9° TYP		
$\theta_2$	9° TYP		



SYMBOL	MILLIMETER		
	MIN	NOM	MAX
A	7.050	7.100	7.150
A1	0.960	1.010	1.060
A2	2.250	2.300	2.350
A3	0.000	0.050	0.100
b	0.760REF.		
b1	1.000REF.		
c	0.508REF.		
c1	0.508REF.		
D	6.550	6.600	6.650
D1	5.220	5.320	5.420
E	0.950	1.000	1.050
E1	9.700	9.900	10.100
E2	6.050	6.100	6.150
e	2.286BSC		
e1	4.572REF.		
L	2.650	2.800	2.950
L1	0.700	0.800	0.900
$\theta_1$	7° REF.		
R	1.300REF.		
R1	0.250REF.		


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