

### ● General Description

The AGM303D1 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

- Advance high cell density Trench technology
- Low  $R_{DS(ON)}$  to minimize conductive loss
- Low Gate Charge for fast switching
- Low Thermal resistance
- 100% Avalanche tested
- 100% DVDS tested

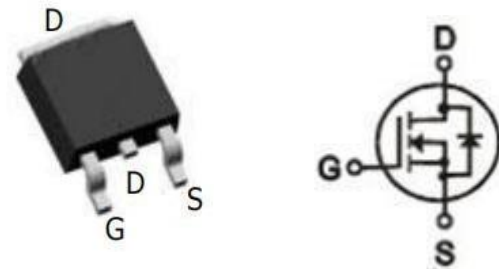
### ● Application

- MB/VGA Vcore
- SMPS 2<sup>nd</sup> Synchronous Rectifier
- POL application
- BLDC Motor driver

### Product Summary

BVDSS	RDSON	ID
30V	2.0mΩ	100A

### TO-252 Pin Configuration



### Package Marking and Ordering Information

Device Marking	Device	Device Package	Reel Size	Tape width	Quantity
AGM303D	AGM303D1	TO-252	330mm	12mm	2500

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

Symbol	Parameter	Value	Unit
VDS	Drain-Source Voltage (VGS=0V)	30	V
VGS	Gate-Source Voltage (VDS=0V)	±20	V
ID	Drain Current-Continuous(Tc=25°C) <b>(Note 1)</b>	100	A
	Drain Current-Continuous(Tc=100°C)	63	A
IDM (pluse)	Drain Current-Continuous@ Current-Pulsed <b>(Note 2)</b>	400	A
PD	Maximum Power Dissipation(Tc=25°C)	75	w
	Maximum Power Dissipation(Tc=100°C)	30	w
EAS	Avalanche energy <b>(Note 3)</b>	108	mJ
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>	---	50	°C/W
RθJC	Thermal Resistance Junction-Case <sup>1</sup>	---	1.66	°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	30	--	--	V
IDSS	Zero Gate Voltage Drain Current	VDS=30V, VGS=0V	--	--	1.0	μA
IGSS	Gate-Body Leakage Current	VGS=±20V, VDS=0V	--	--	±100	nA
VGS(th)	Gate Threshold Voltage	VDS=VGS, ID=250μA	1.0	1.5	2.2	V
gFS	Forward Transconductance	VDS=5V, ID=20A	--	30	--	S
RDS(on)	Drain-Source On-State Resistance	VGS=10V, ID=30A	--	2.0	3.6	mΩ
		VGS=4.5V, ID=20A	--	3.1	6.0	mΩ
<b>Dynamic Characteristics</b>						
Ciss	Input Capacitance	VGS=0V, F=1MHZ	--	2500	--	pF
Coss	Output Capacitance		--	385	--	pF
Crss	Reverse Transfer Capacitance		--	350	--	pF
Rg	Gate resistance	VGS=0V, VDS=0V, f=1.0MHz	--	--	--	Ω
<b>Switching Times</b>						
td(on)	Turn-on Delay Time	VGS=10V, VDS=15V ID=30A, RGEN=3.3Ω	--	12	--	nS
tr	Turn-on Rise Time		--	8.0	--	nS
td(off)	Turn-Off Delay Time		--	46	--	nS
tf	Turn-Off Fall Time		--	25	--	nS
Qg	Total Gate Charge	VGS=10V, VDS=15V, ID=30A	--	49	--	nC
Qgs	Gate-Source Charge		--	6.5	--	nC
Qgd	Gate-Drain Charge		--	14	--	nC
<b>Source-Drain Diode Characteristics</b>						
ISD	Source-Drain Current(Body Diode)	VG=VD=0V , Force Current	--	--	100	A
VSD	Forward on Voltage	VGS=0V, IS=30A	--	--	1.2	V
trr	Reverse Recovery Time	IF=30A , dI/dt=100A/μs , TJ=25°C	--	14	--	ns
Qrr	Reverse Recovery Charge		--	7.8	--	nc

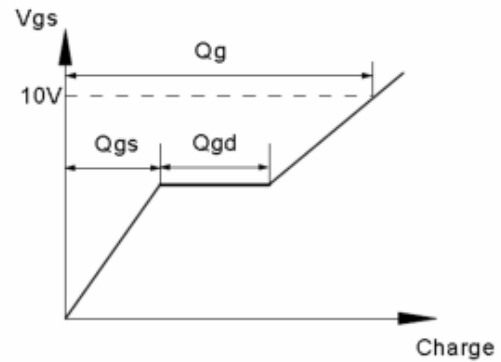
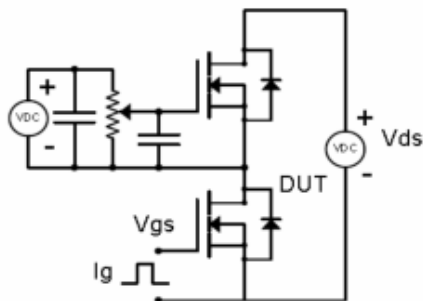
Notes 1.The maximum current rating is package limited.

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

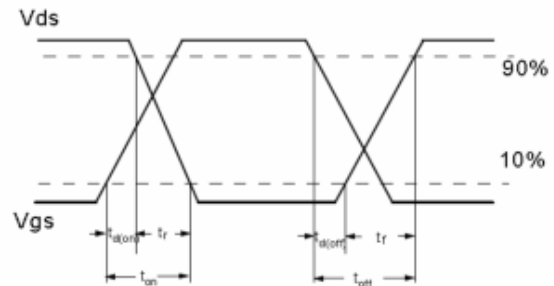
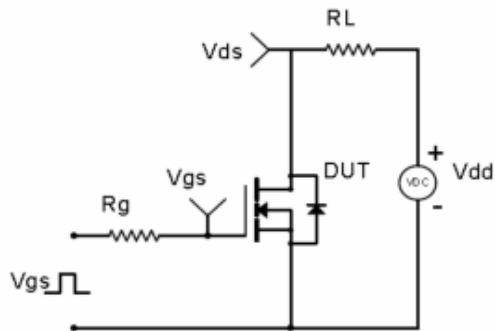
Notes 3.Pulse Test: Pulse Width≤300μs, Duty Cycle≤0.5%

## Test Circuit & Waveform

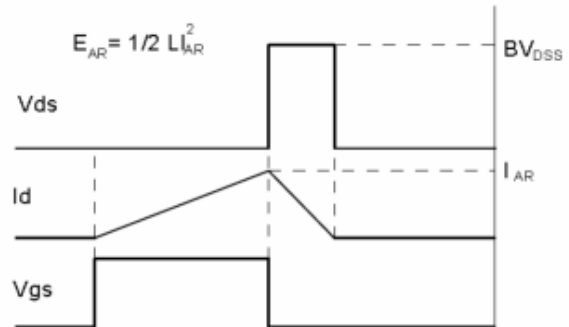
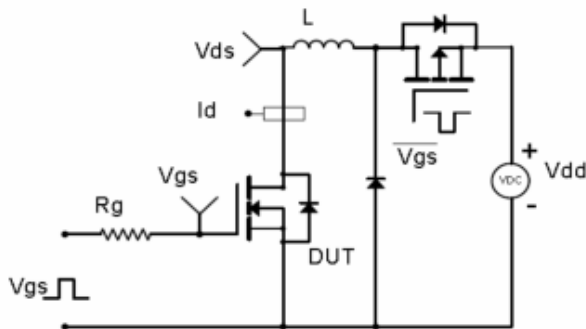
### Gate Charge Test Circuit & Waveform



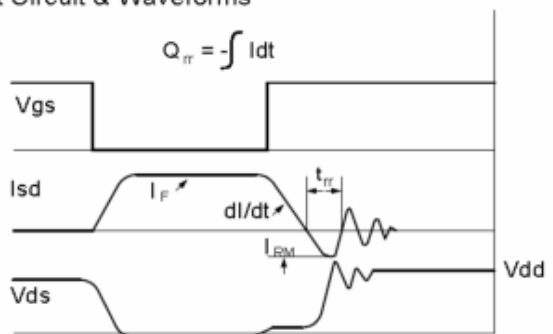
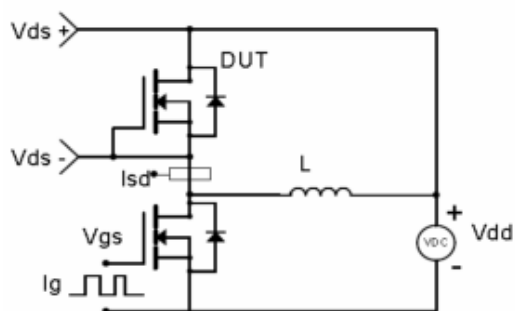
### Resistive Switching Test Circuit & Waveforms



### Unclamped Inductive Switching (UIS) Test Circuit & Waveforms



### Diode Recovery Test Circuit & Waveforms



## Typical Performance Characteristics

Fig.1 Power Dissipation Derating Curve

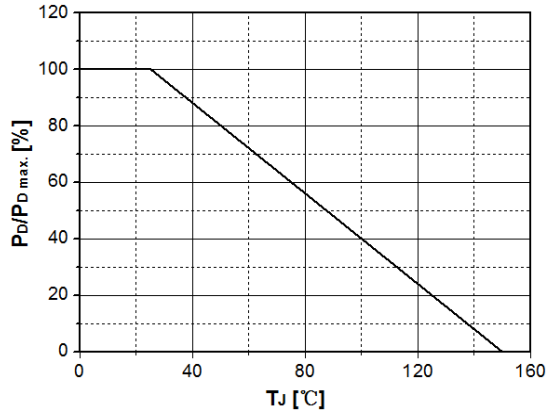


Fig.2 Avalanche Energy Derating Curve vs. Junction Temperature

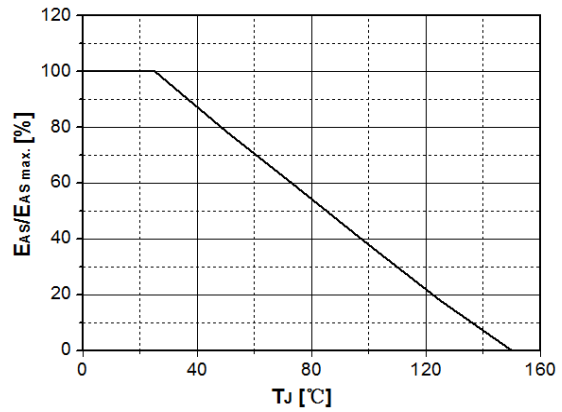


Fig.3 Typical Output Characteristics

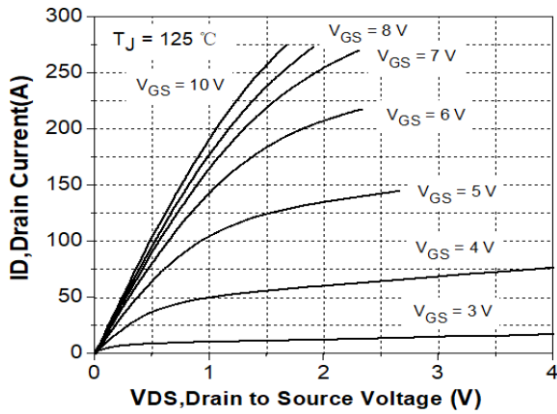


Fig. 4 Transconductance vs. Drain Current

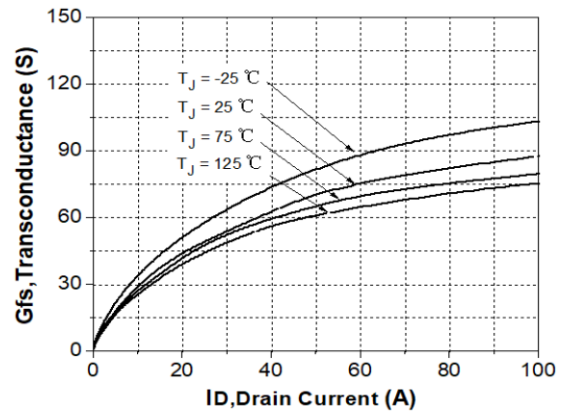


Fig.5 Typical Transfer Characteristics

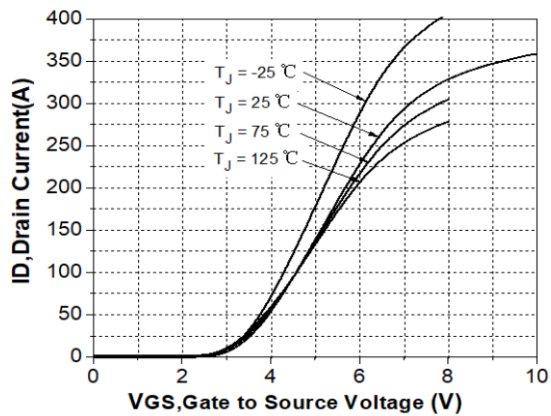


Fig. 6 State Resistance vs. Drain Current @-25°C

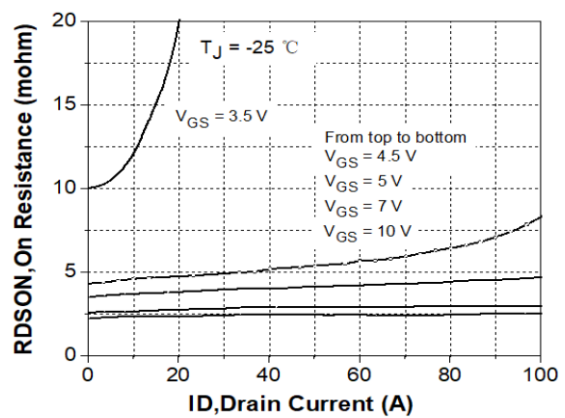


Fig.7 State Resistance vs. Drain Current @25°C

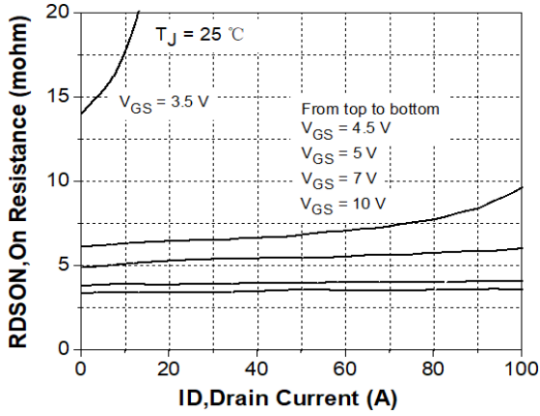


Fig. 8 State Resistance vs. Drain Current @125°C

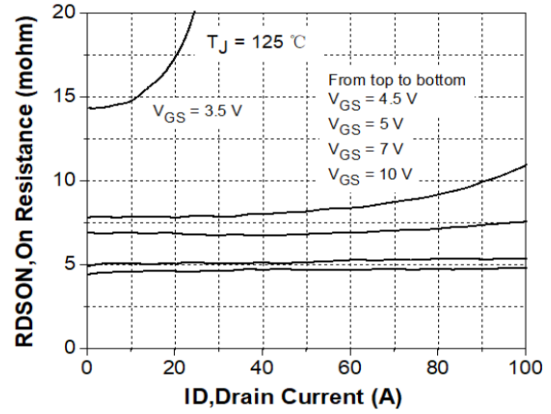


Fig.9 Typical Capacitance vs. Drain Source Voltage

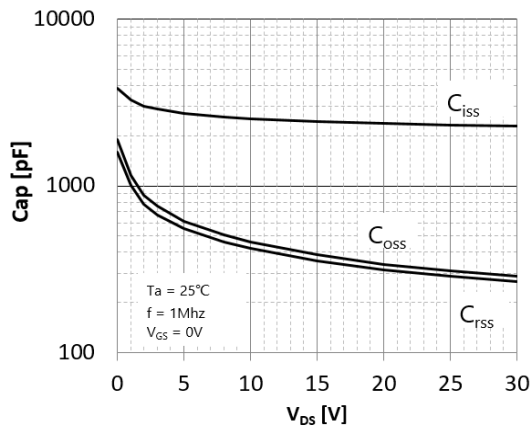


Fig.10 Dynamic Input Characteristics

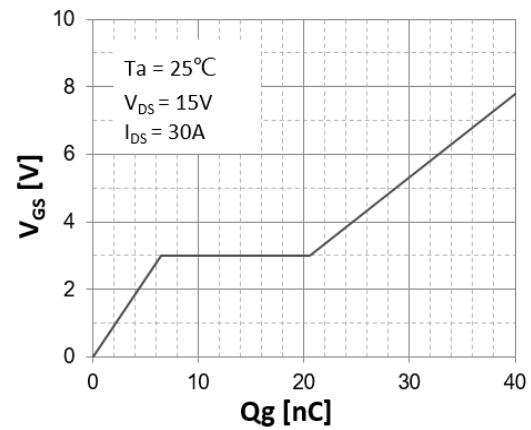


Fig.11 Breakdown Voltage vs. Junction Temperature

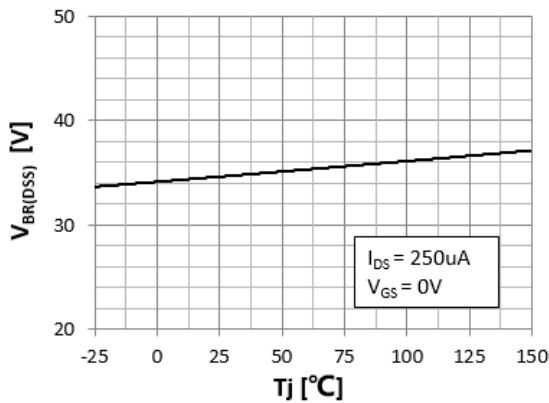


Fig. 12 Gate Threshold Voltage vs. Junction Temperature

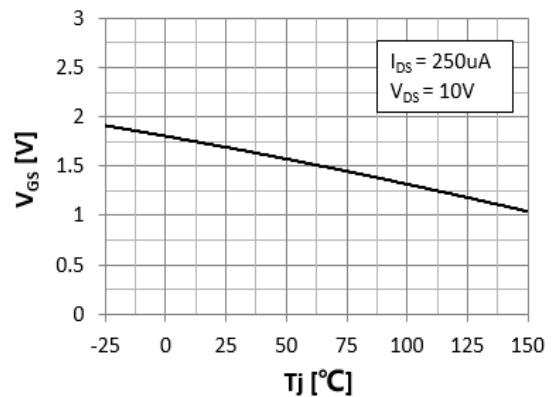


Fig.13 On-Resistance Variation vs. Junction Temperature

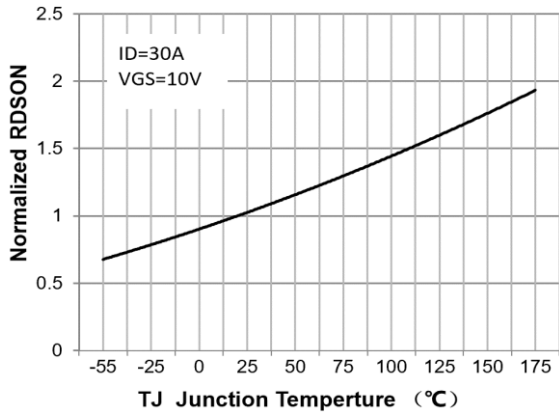


Fig.14 Maximum Drain Current vs. Case Temperature

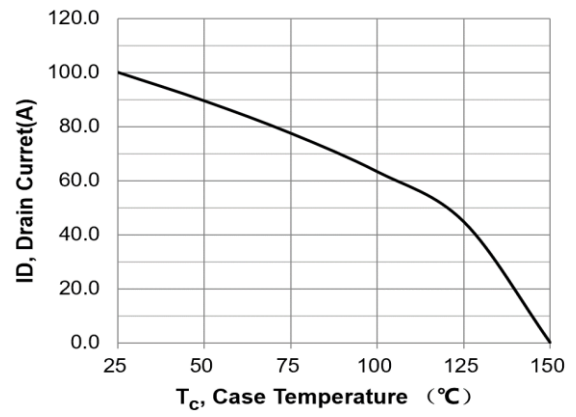


Fig.15 Body Diode Forward Voltage Vs Reverse Drain Current

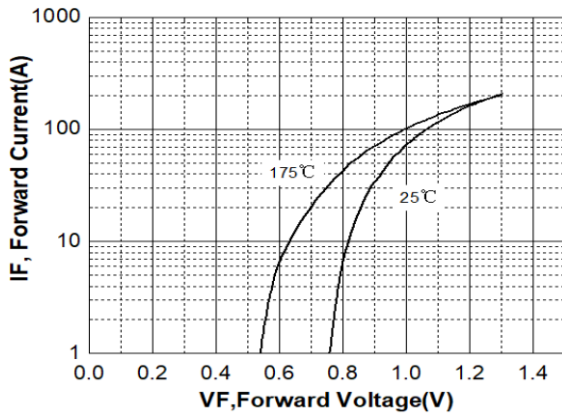


Fig.16 Safe Operating Area

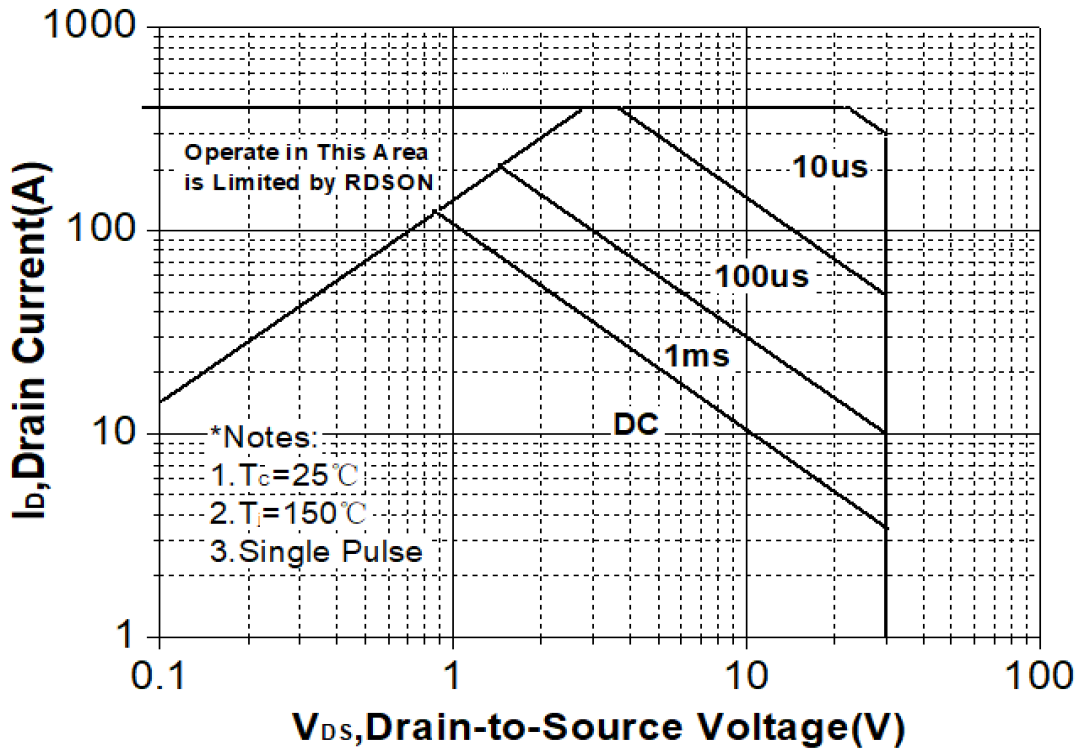
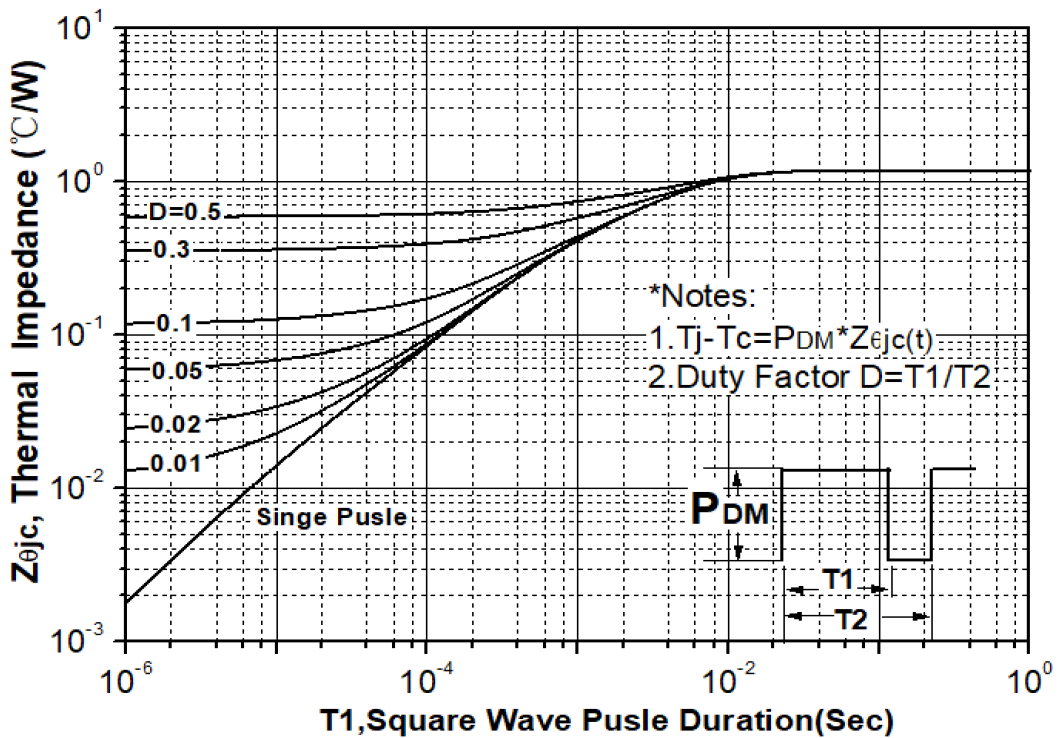
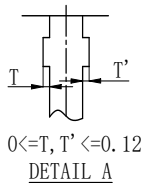
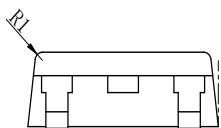
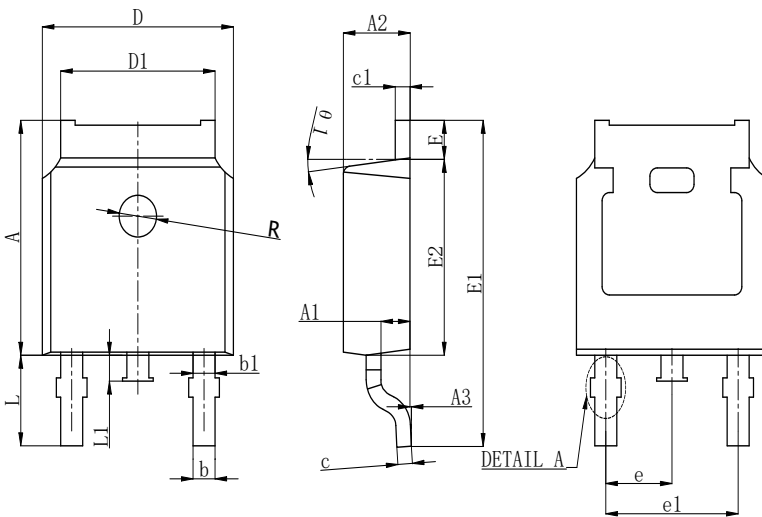
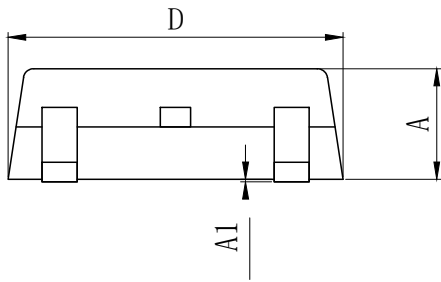
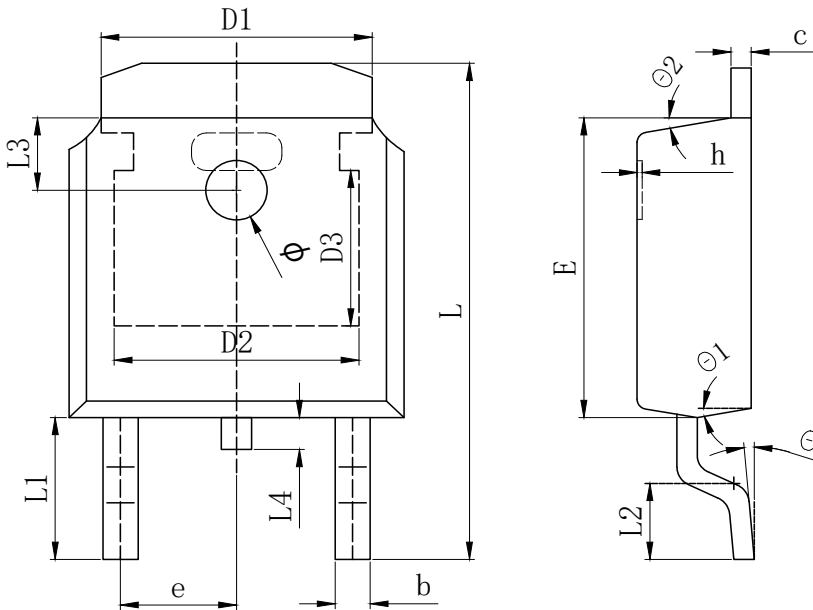


Fig. 17 Transient Thermal Response Curve



## 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
Φ	1.100	1.200	1.300
θ	0°		8°
θ 1	9° TYP		
θ 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
θ 1	7° REF.		
R	1.300REF.		
R1	0.250REF.		




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