

• General Description

The AGM403DG 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

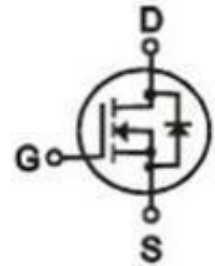
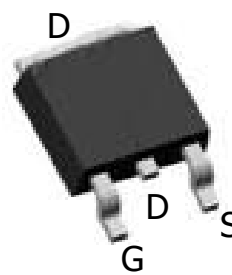
• Application

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

Product Summary

BVDSS	RDSON	ID
40V	3.0mΩ	101A

TO-252 Pin Configuration



Package Marking and Ordering Information

Device Marking	Device	Device Package	Reel Size	Tape width	Quantity
AGM403DG	AGM403DG	TO-252	330mm	16mm	2500

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

Symbol	Parameter	Value	Unit
VDS	Drain-Source Voltage (VGS=0V)	40	V
VGS	Gate-Source Voltage (VDS=0V)	±20	V
ID	Drain Current-Continuous(Tc=25°C) (Note 1)	101	A
	Drain Current-Continuous(Tc=100°C)	70	A
IDM (pluse)	Drain Current-Continuous@ Current-Pulsed (Note 2)	405	A
PD	Maximum Power Dissipation(Tc=25°C)	28	w
	Maximum Power Dissipation(Tc=100°C)	11	w
EAS	Avalanche energy (Note 3)	75	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) ¹	---	60	°C/W
RθJC	Thermal Resistance Junction-Case ¹	---	4.5	°C/W

Table 3. Electrical Characteristics (TJ=25°C unless otherwise noted)

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
On/Off States						
BVDSS	Drain-Source Breakdown Voltage	VGS=0V ID=250μA	40	--	--	V
IDSS	Zero Gate Voltage Drain Current	VDS=40V,VGS=0V	--	--	1	μA
IGSS	Gate-Body Leakage Current	VGS=±20V,VDS=0V	--	--	100	nA
VGS(th)	Gate Threshold Voltage	VDS=VGS,ID=250μA	1.1	1.6	2.5	V
gFS	Forward Transconductance	VDS=5V,ID=10A	--	4	--	S
RDS(on)	Drain-Source On-State Resistance	VGS=10V, ID=20A	--	3.0	3.8	mΩ
		VGS=4.5V, ID=15A	--	3.8	4.8	mΩ
Dynamic Characteristics						
Ciss	Input Capacitance	VDS=20V,VGS=0V, F=1MHZ	--	842	--	pF
Coss	Output Capacitance		--	321	--	pF
Crss	Reverse Transfer Capacitance		--	13	--	pF
Rg	Gate resistance	VGS=0V, VDS=0V,f=1.0MHz	--	3.7	--	Ω
Switching Times						
td(on)	Turn-on Delay Time	VGS=10V,VDS=20V, RL=1Ω,RGEN=1.6Ω	--	5.5	--	nS
tr	Turn-on Rise Time		--	49.5	--	nS
td(off)	Turn-Off Delay Time		--	18.0	--	nS
tf	Turn-Off Fall Time		--	5.5	--	nS
Qg	Total Gate Charge	VGS=10V, VDS=20V, ID=20A	--	13.5	--	nC
Qgs	Gate-Source Charge		--	2.4	--	nC
Qgd	Gate-Drain Charge		--	2.6	--	nC
Source-Drain Diode Characteristics						
ISD	Source-Drain Current(Body Diode)		--	--	101	A
VSD	Forward on Voltage	VGS=0V,IS=20A	--	--	1.2	V
trr	Reverse Recovery Time	ID=20A ,VDD=20V	--	28.6	--	ns
Qrr	Reverse Recovery Charge	dI/dt=100A/μs , TJ=25℃	--	15.0	--	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°C

Electrical Characteristics Diagrams

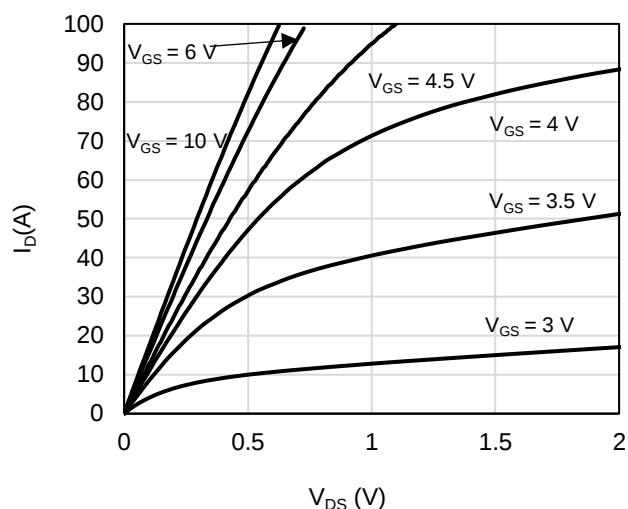


Figure 1: On-Region Characteristics

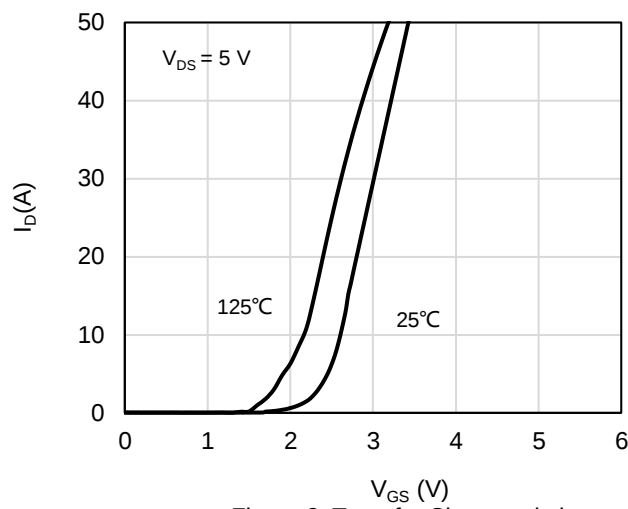


Figure 2: Transfer Characteristics

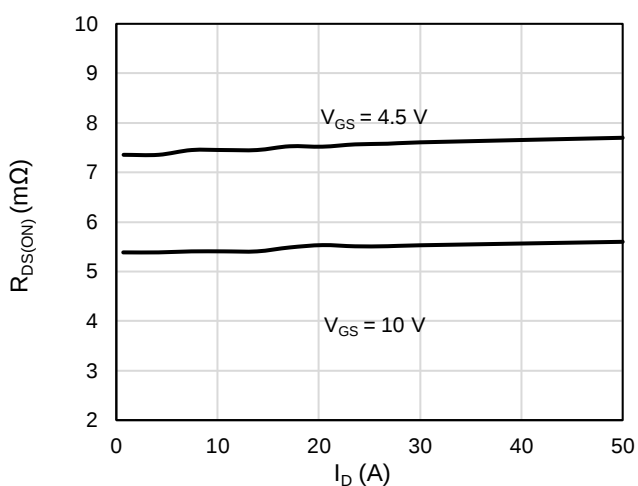


Figure 3: On-Resistance vs. Drain Current and Gate Voltage

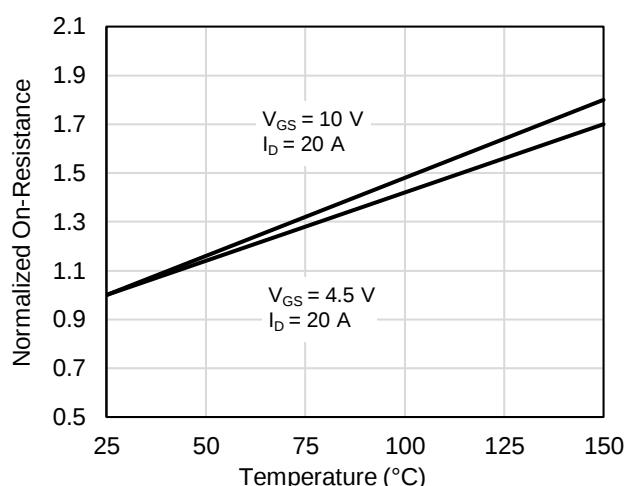


Figure 4: On-Resistance vs. Junction Temperature

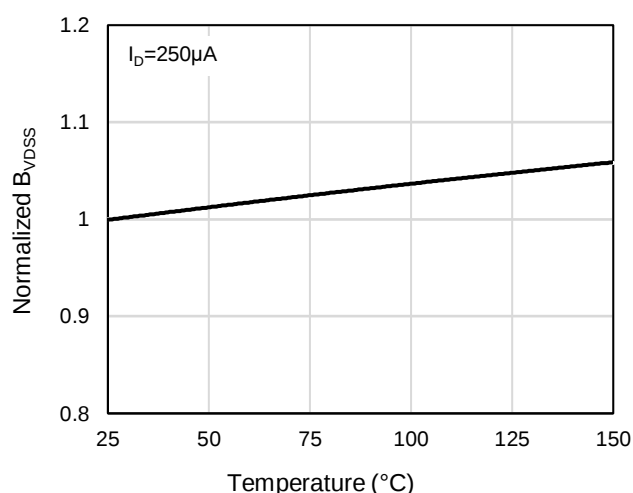


Figure 5: Breakdown Voltage vs. Junction Temperature

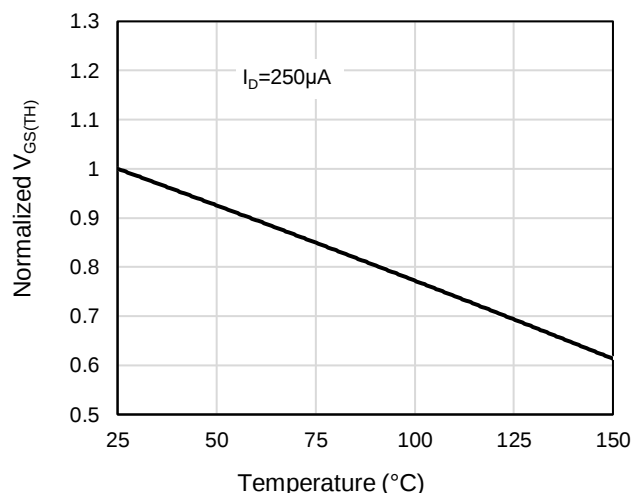


Figure 6: Threshold Voltage vs. Junction Temperature

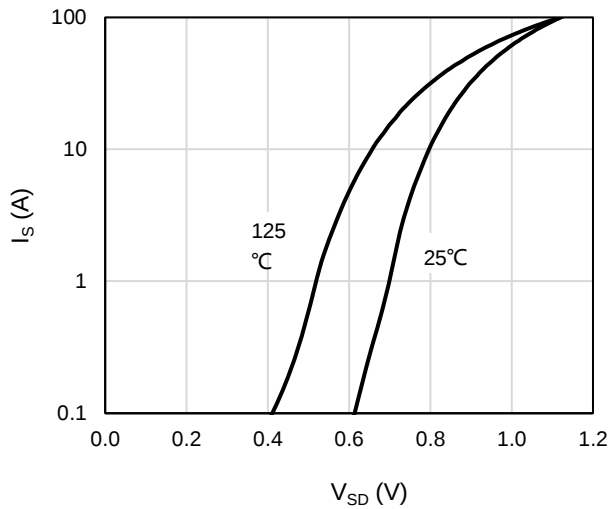


Figure 7: Body-Diode Characteristics

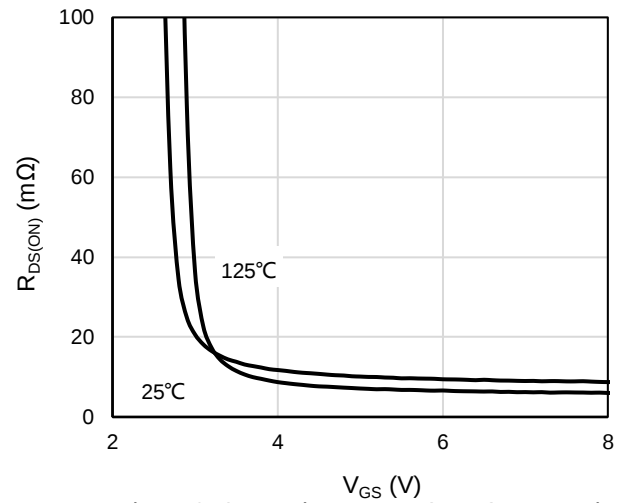


Figure 8: On-Resistance vs. Gate-Source Voltage

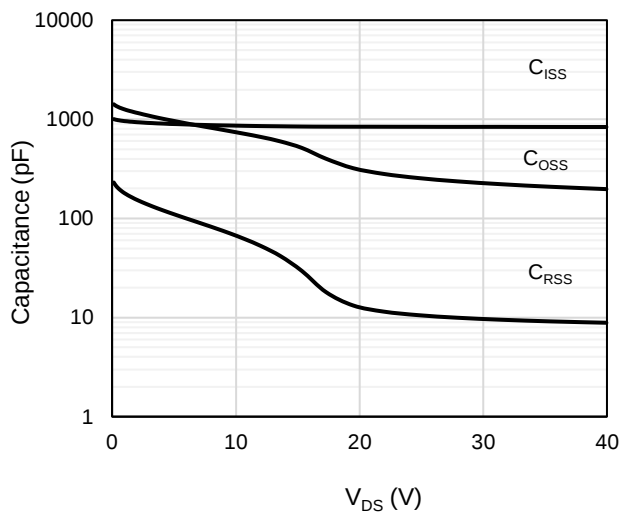


Figure 9: Capacitance Characteristics

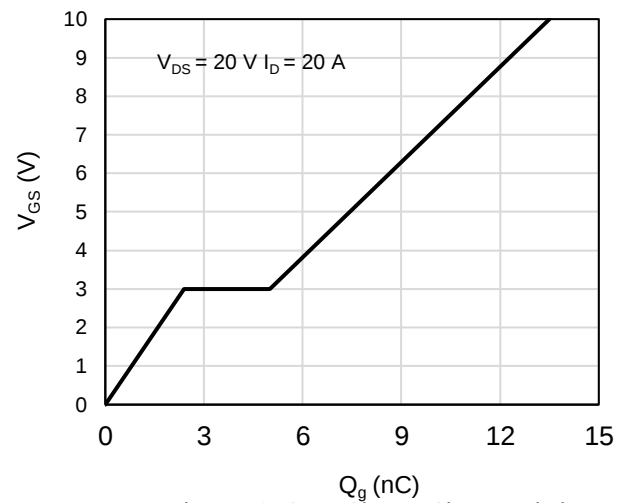


Figure 10: Gate-Charge Characteristics

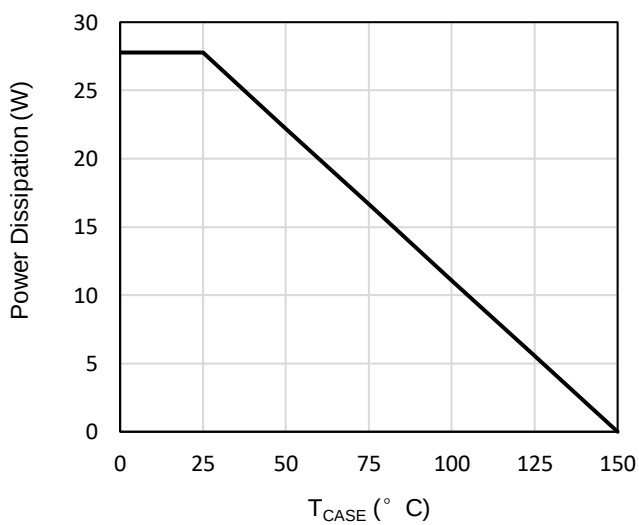


Figure 11: Power De-rating

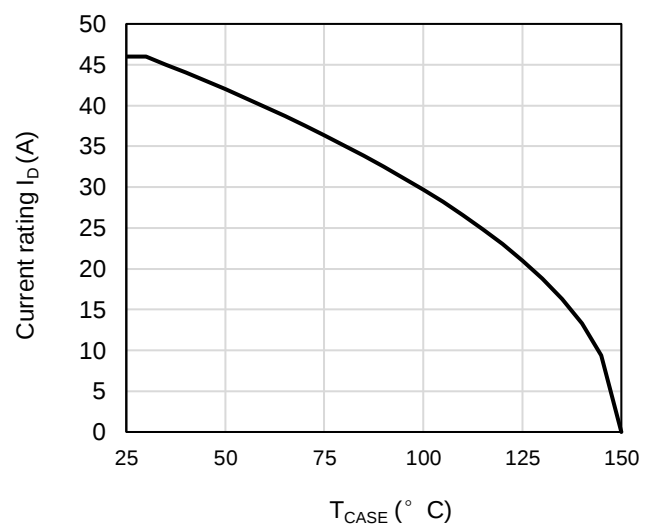
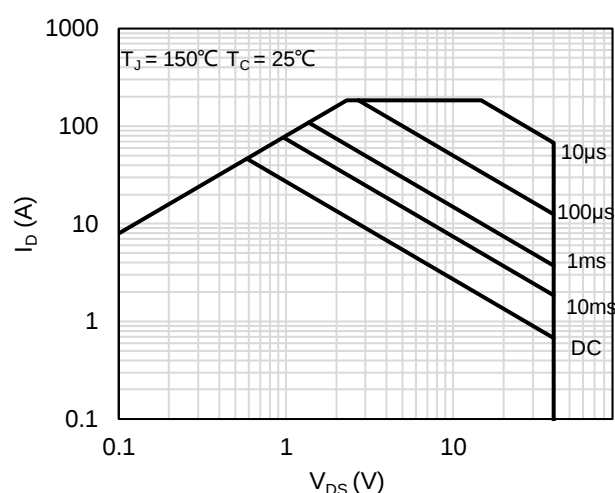
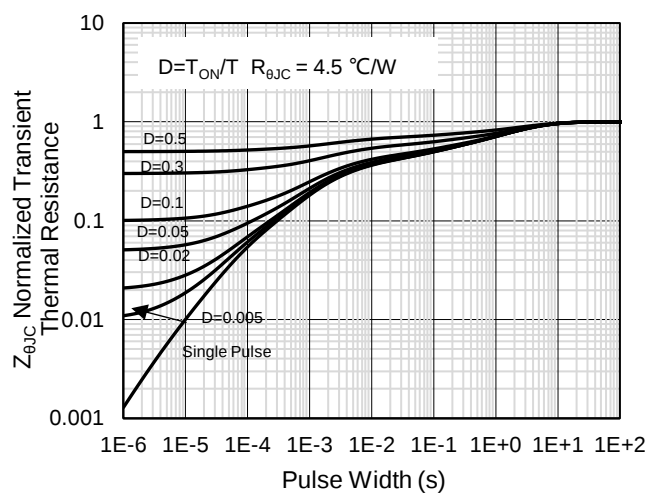
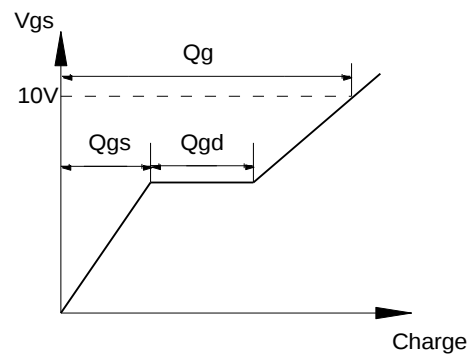
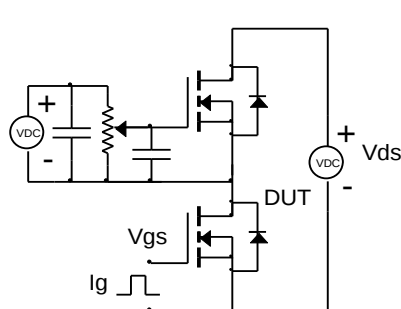


Figure 12: Current De-rating

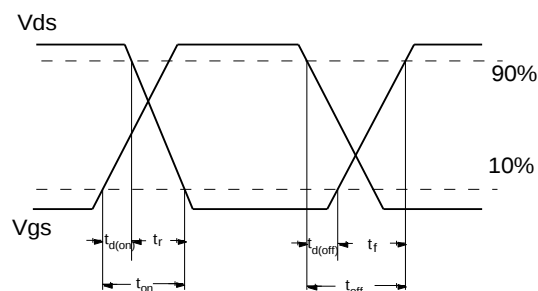
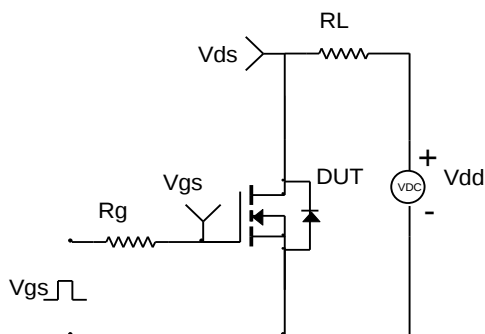


Test Circuit and Waveform

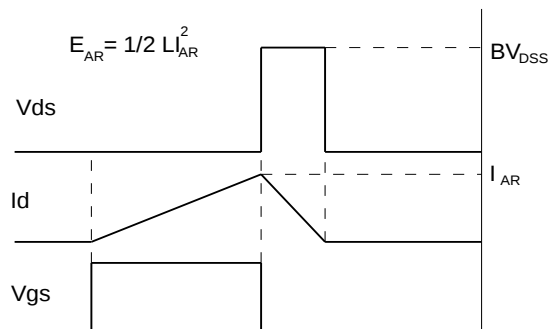
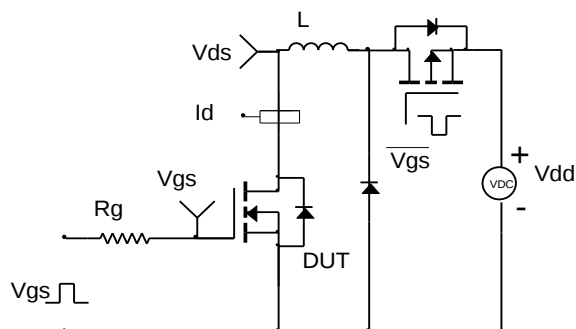
Gate Charge Test Circuit & Waveform



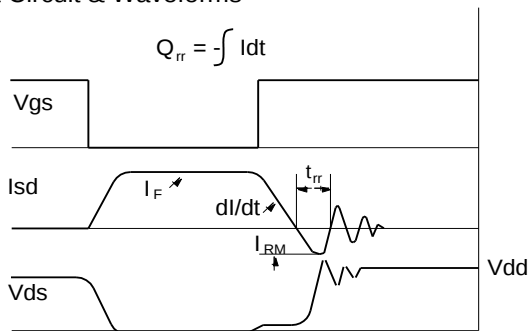
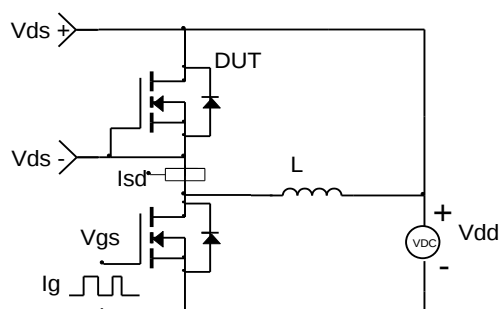
Resistive Switching Test Circuit & Waveforms



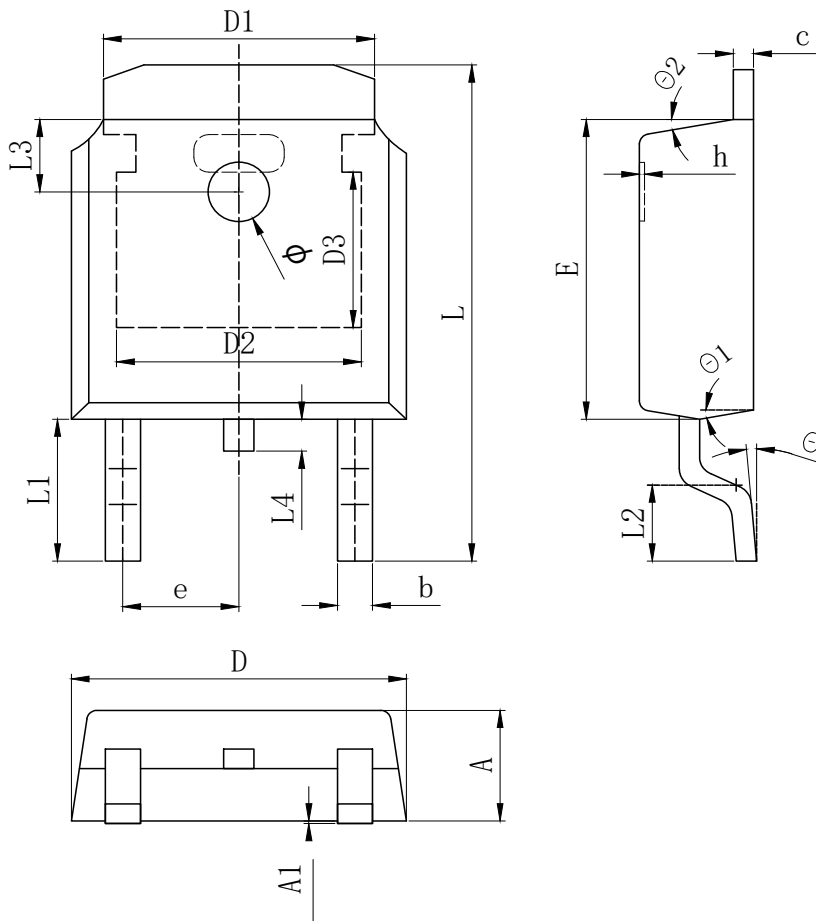
Unclamped Inductive Switching (UIS) Test Circuit & Waveforms



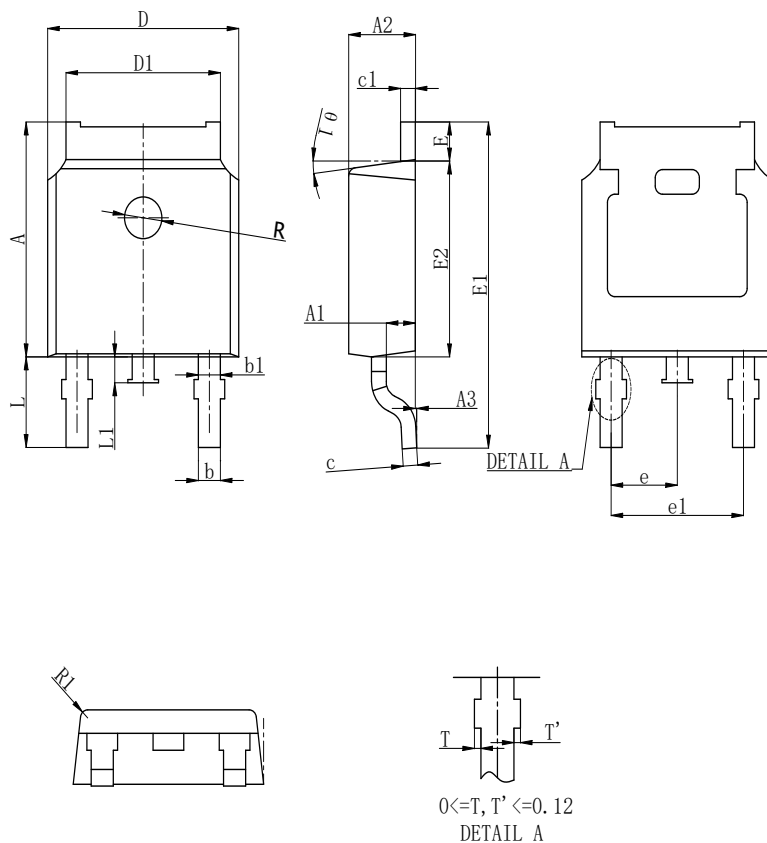
Diode Recovery Test Circuit & Waveforms



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
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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