General Description

The AGM665E 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

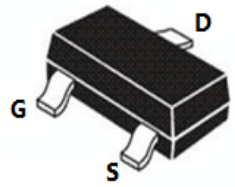
Application

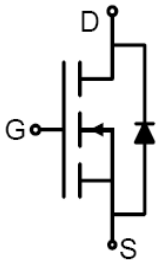
- MB/VGA Vcore
- SMPS 2nd Synchronous Rectifier
- POL application
- BLDC Motor driver

Product Summary

BVDSS	RDSON	ID
60V	60mΩ	3A

SOT23-3 Pin Configuration





Package Marking and Ordering Information

Device Marking	Device	Device Package	Reel Size	Tape width	Quantity
665E	AGM665E	SOT23-3	----	----	3000

Table 1. Absolute Maximum Ratings (TA=25℃)

Symbol	Parameter	Value	Unit
VDS	Drain-Source Voltage (VGS=0V)	60	V
VGS	Gate-Source Voltage (VDS=0V)	±20	V
ID	Drain Current-Continuous(Ta=25℃) **(Note 1)**	3	A
	Drain Current-Continuous(Ta=100℃)	1.9	A
IDM (pluse)	Drain Current-Continuous@ Current-Pulsed **(Note 2)**	20	A
PD	Maximum Power Dissipation(Ta=25℃)	1.5	w
	Maximum Power Dissipation(Ta=100℃)	0.6	w
EAS	Avalanche energy **(Note 3)**	--	mJ
TJ,TSTG	Operating Junction and Storage Temperature Range	-55 To 150	℃

Table 2. Thermal Characteristic

Symbol	Parameter	Typ	Max	Unit
RθJA	Thermal Resistance Junction-ambient (Steady State)[1]	--	85	℃/W
RθJC	Thermal Resistance Junction-Case[1]	---	--	℃/W

Table 3. Electrical Characteristics (TA=25℃unless otherwise noted)

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
On/Off States						
BV_{DSS}	Drain-Source Breakdown Voltage	VGS=0V ID=250μA	60	--	--	V
IDSS	Zero Gate Voltage Drain Current	VDS=60V,VGS=0V	--	--	1	μA
IGSS	Gate-Body Leakage Current	VGS=±20V,VDS=0V	--	--	±100	nA
VGS(th)	Gate Threshold Voltage	VDS=VGS,ID=250μA	0.9	1.3	2.0	V
gFS	Forward Transconductance	VDS=5V,ID=20A	--	--	--	S
RDS(on)	Drain-Source On-State Resistance	VGS=10V, ID=3A	--	60	80	mΩ
		VGS=4.5V, ID=2A	--	70	95	mΩ
Dynamic Characteristics						
Ciss	Input Capacitance	VDS=30V,VGS=0V, F=1MHZ	--	400	--	pF
Coss	Output Capacitance		--	28	--	pF
Crss	Reverse Transfer Capacitance		--	23	--	pF
Rg	Gate resistance	VGS=0V, VDS=0V,f=1.0MHz	--	2.8	--	Ω
Switching Times						
td(on)	Turn-on Delay Time	VGS=10V,VDS=30V, ID=3A,RGEN=2.3Ω	--	4.5	--	nS
tr	Turn-on Rise Time		--	10	--	nS
td(off)	Turn-Off Delay Time		--	12.5	--	nS
tf	Turn-Off Fall Time		--	1.5	--	nS
Qg	Total Gate Charge	VGS=10V, VDS=30V, ID=3A	--	8.8	--	nC
Qgs	Gate-Source Charge		--	1.0	--	nC
Qgd	Gate-Drain Charge		--	2.5	--	nC
Source-Drain Diode Characteristics						
ISD	Source-Drain Current(Body Diode)		--	--	3.0	A
VSD	Forward on Voltage	VGS=0V,IS=3A	--	--	1.2	V
trr	Reverse Recovery Time	IF=3A , dI/dt=100A/μs , TJ=25℃	--	24	--	ns
Qrr	Reverse Recovery Charge		--	12	--	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℃

■Typical Electrical and Thermal Characteristics Diagrams

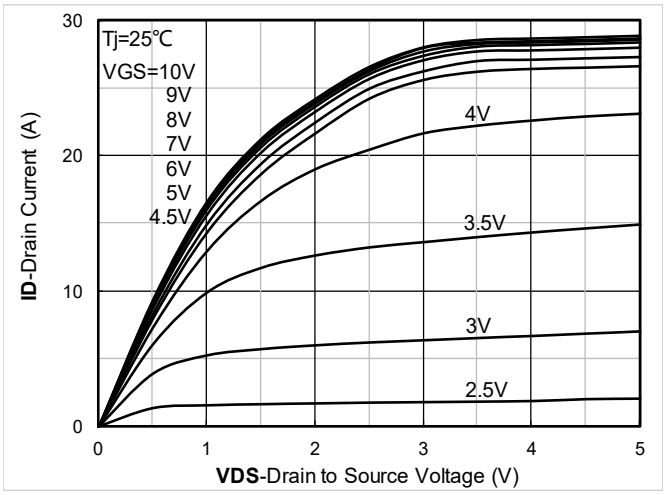


Figure 1. Output Characteristics

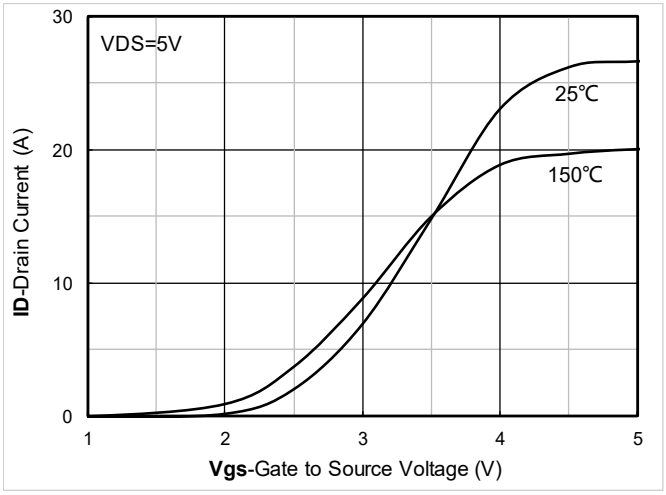


Figure 2. Transfer Characteristics

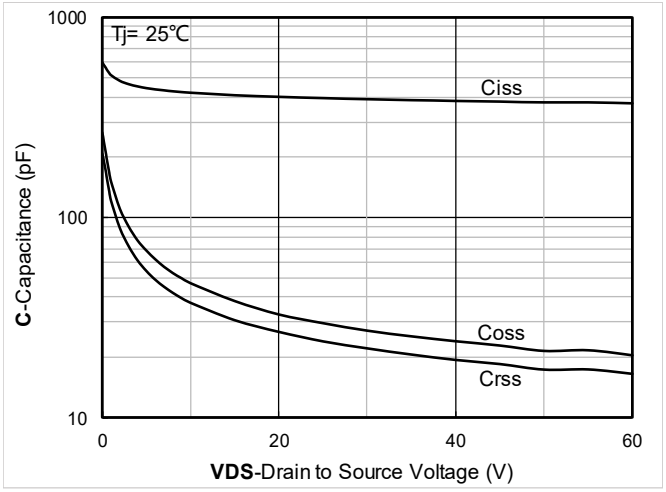


Figure 3. Capacitance Characteristics

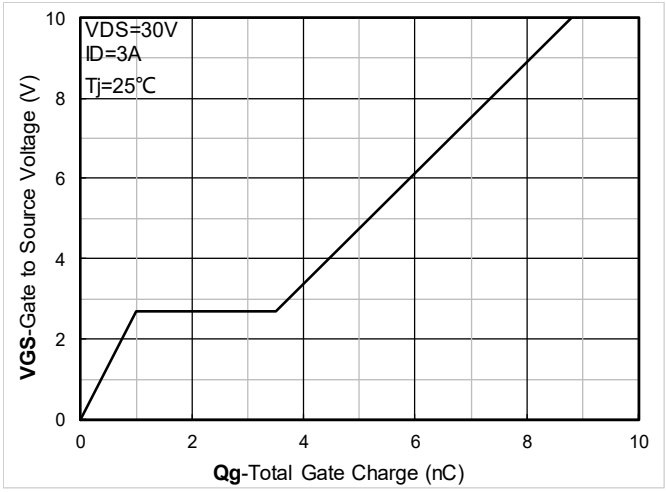


Figure 4. Gate Charge

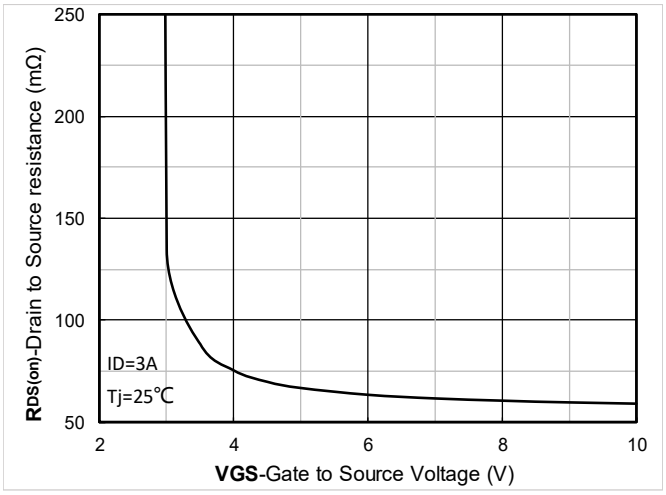


Figure 5. On-Resistance vs Gate to Source Voltage

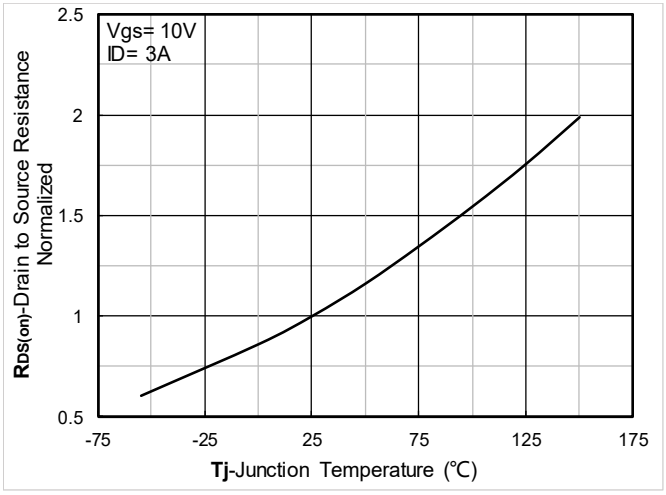


Figure 6. Normalized On-Resistance

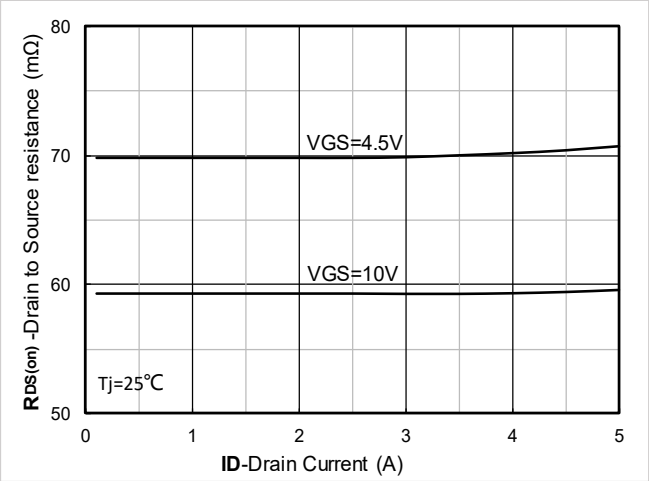


Figure 7. $R_{DS(on)}$ VS Drain Current

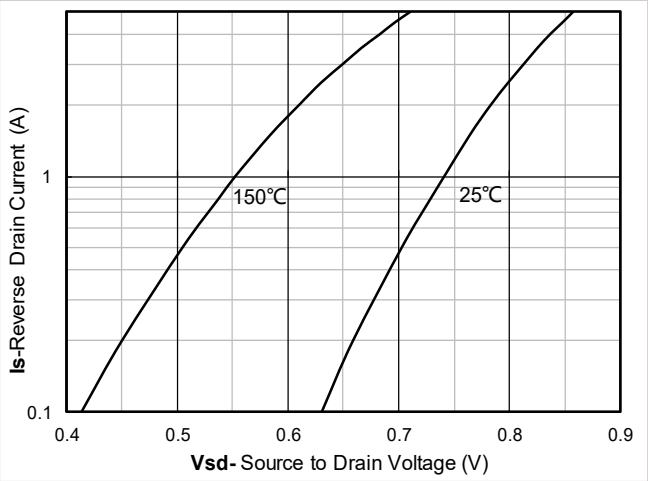


Figure 8. Forward characteristics of reverse diode

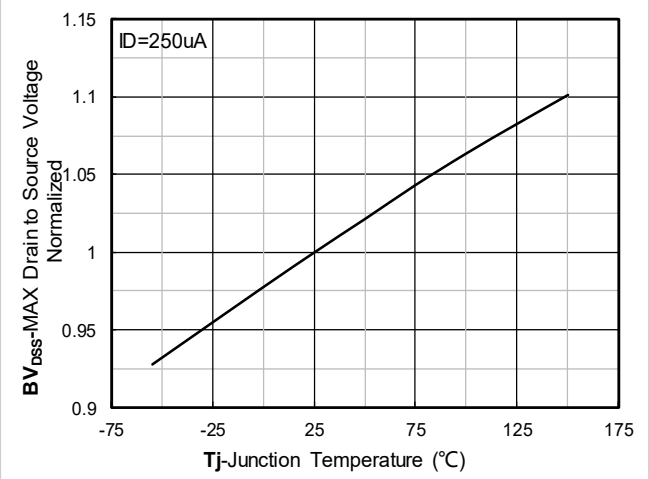


Figure 9. Normalized breakdown voltage

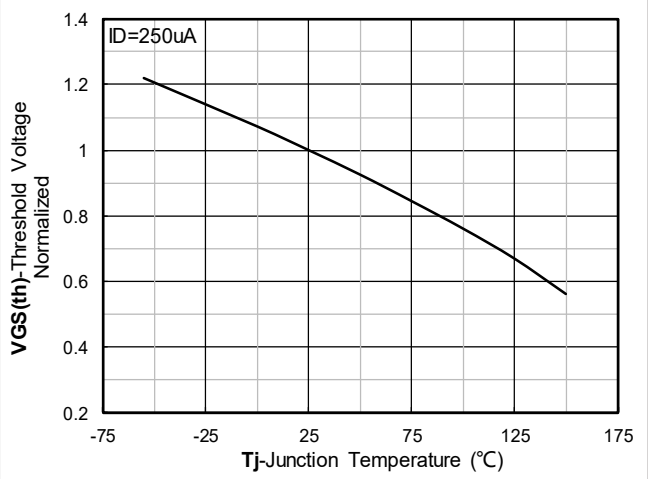


Figure 10. Normalized Threshold voltage

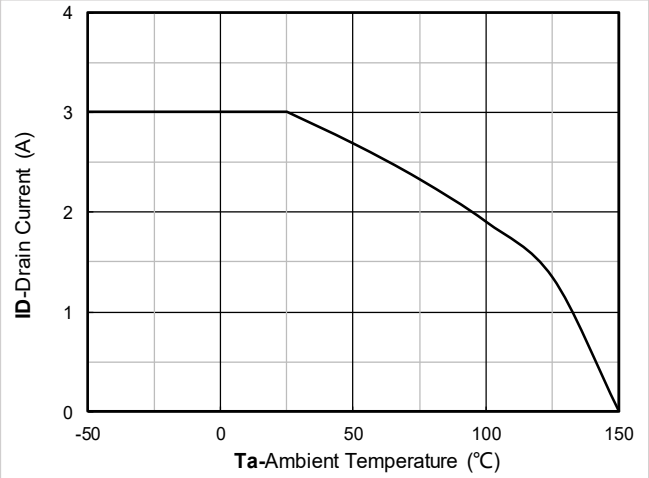


Figure 11. Current dissipation

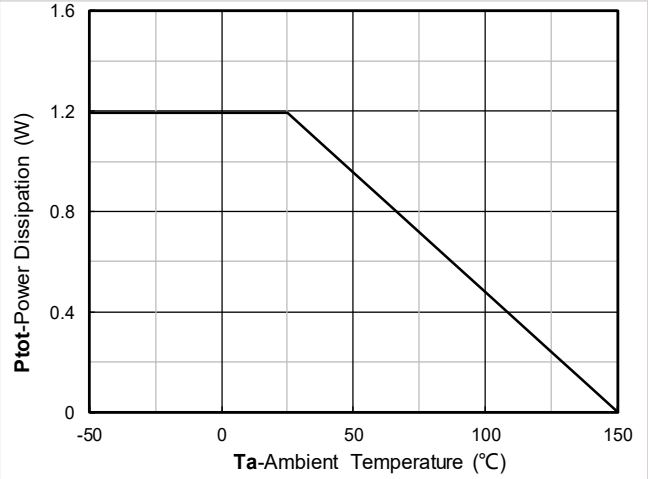


Figure 12. Power dissipation

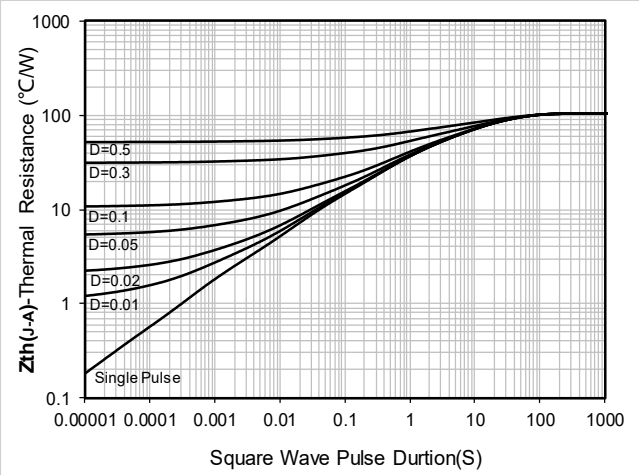


Figure 13. Maximum Transient Thermal Impedance

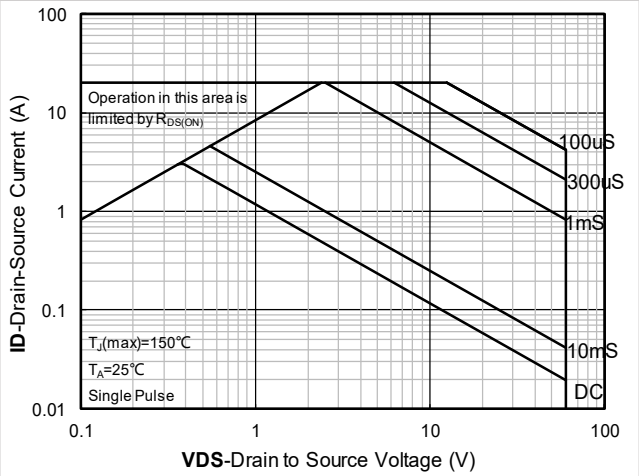


Figure 14. Safe Operation Area

■ Test Circuits & Waveforms

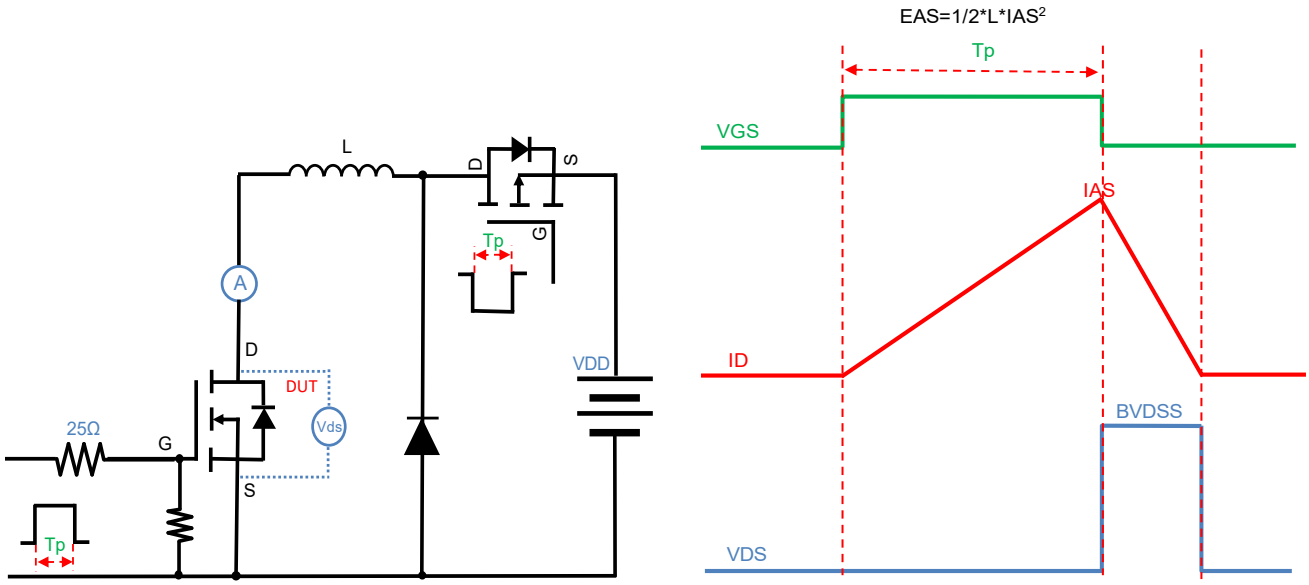


Figure A. Unclamped Inductive Switching (UIS) Test Circuit & Waveform

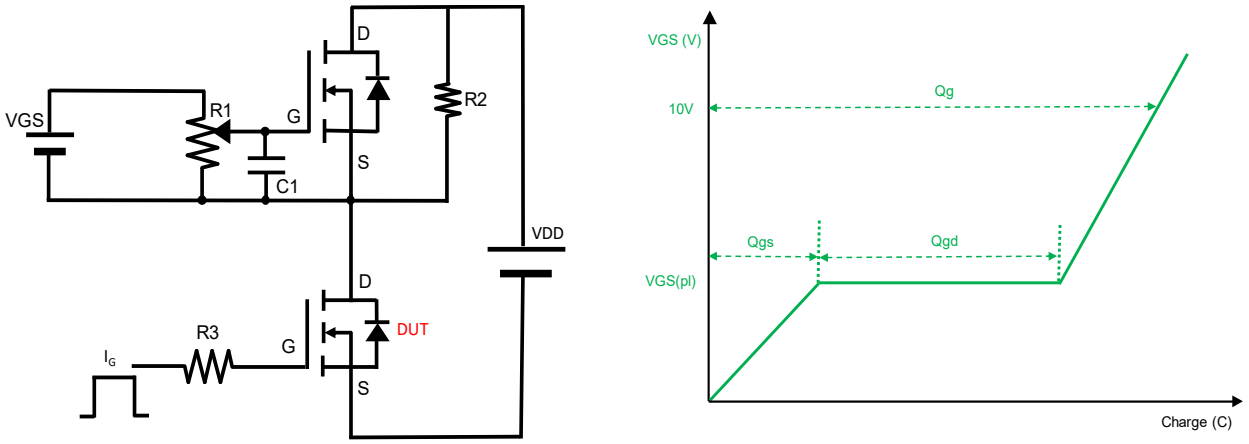


Figure B. Gate Charge Test Circuit & Waveform

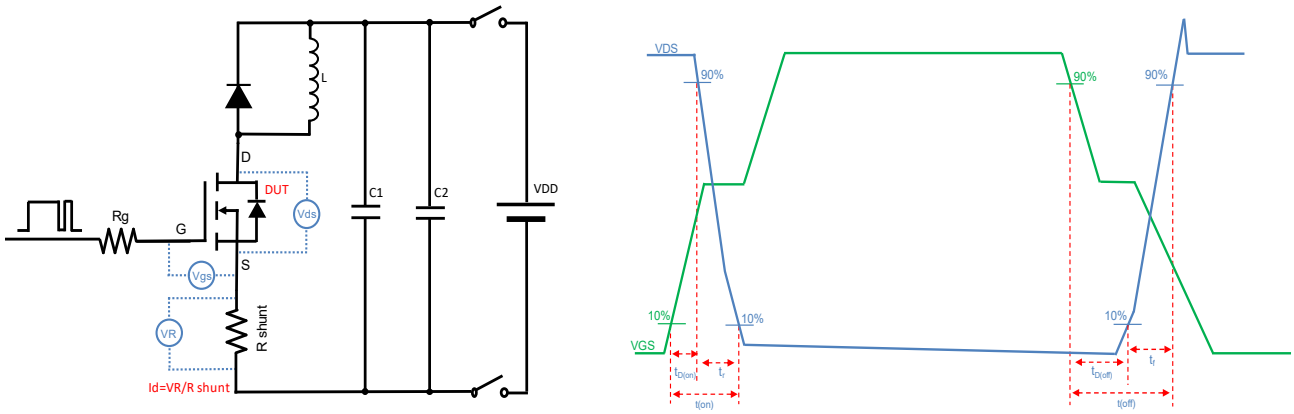


Figure C. Resistive Switching Test Circuit & Waveform

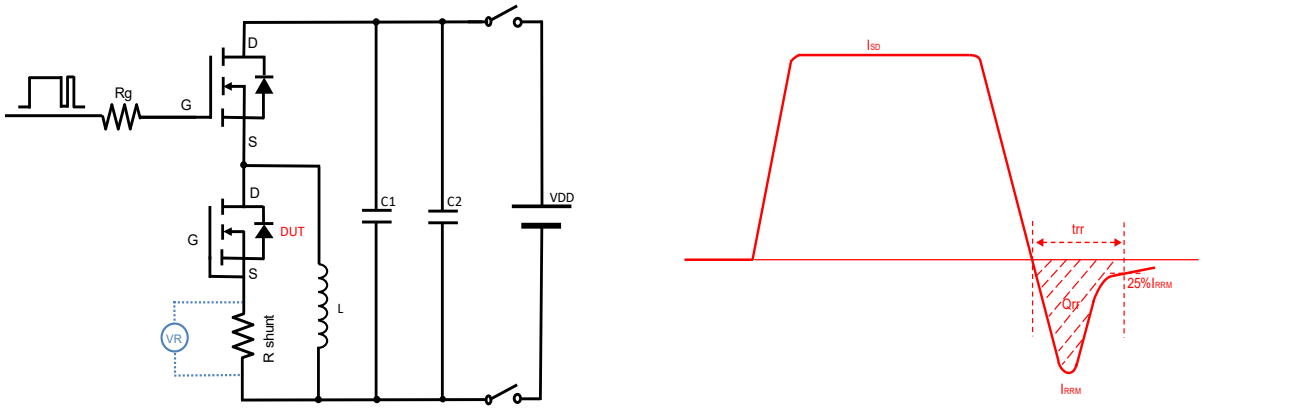
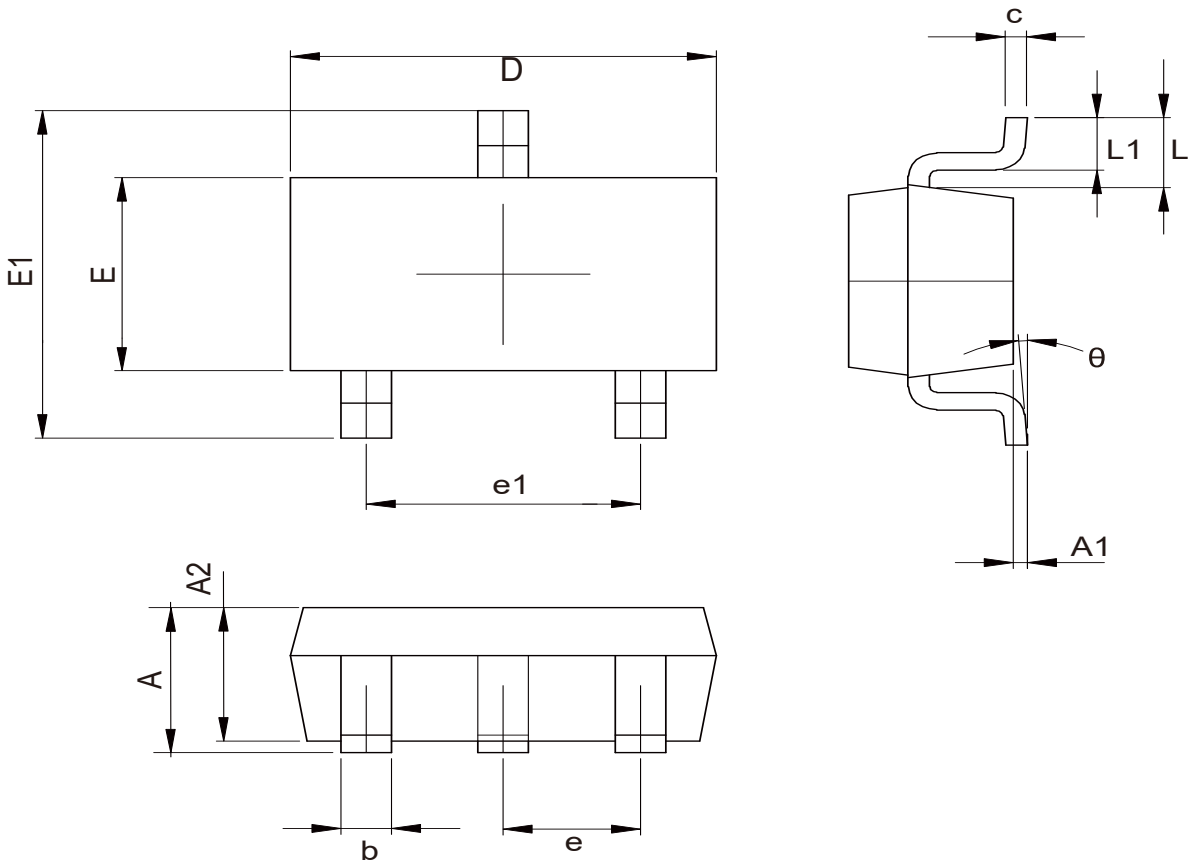


Figure D. Diode Recovery Test Circuit & Waveform

SOT-23-3L
PACKAGE OUTLINE DIMENSIONS



COMMON DIMENSIONS CUNITS MEASURE=MILLIMETER			
SYMBOL	MIN	NOM	MAX
A	1.050	——	1.300
A1	0.000	——	0.200
A2	1.050	——	1.200
b	0.300	0.400	0.500
c	0.100	——	0.200
D	2.820	2.900	3.020
E	1.500	1.600	1.700
E1	2.650	2.800	2.950
e	0.950TYP		
e1	1.800	1.900	2.000
L	0.6REf		
L1	0.300	0.450	0.600
θ	0°	--	8°

Unit:mm

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