CRMEGL0603A

N-Channel 60V, 2.5mΩ Typ. Power MOSFET

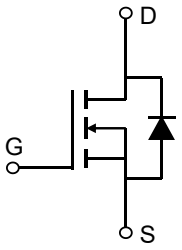
Description

Features

- 60V, 170A

  $R_{DS(ON)}$ Typ = 2.5mΩ @ V_{GS} = 10V

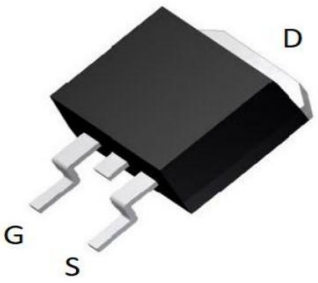
  $R_{DS(ON)}$ Typ = 3.2mΩ @ V_{GS} = 4.5V
- Advanced Split Gate Trench Technology
- Excellent $R_{DS(ON)}$ and Low Gate Charge
- 100% UIS TESTED!
- 100% ΔVds TESTED!

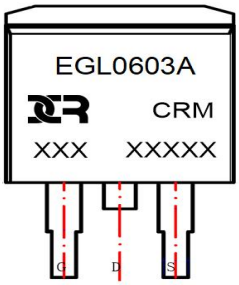


Schematic Diagram

Application

- Load Switch
- PWM Application
- Power Management





Marking and Pin Assignment

Package Marking and Ordering Information

Device	Marking	Package	Outline	Reel Size	Reel (pcs)	Per Carton (pcs)
CRMEGL0603A	CRMEGL0603A	TO-263-3L	TAPING	13"	800	4000

Absolute Maximum Ratings (@ T_J = 25°C unless otherwise specified)

Symbol	Parameter		Value	Units
V_{DS}	Drain-to-Source Voltage		60	V
V_{GS}	Gate-to-Source Voltage		±20	V
I_D	Continuous Drain Current	T_C = 25°C	170	A
		T_C = 100°C	102	A
I_{DM}	Pulsed Drain Current [1]		680	A
E_{AS}	Single Pulsed Avalanche Energy [2]		361	mJ
P_D	Power Dissipation	T_C = 25°C	156	W
$R_{\theta JC}$	Thermal Resistance, Junction to Case		0.8	°C/W
T_J, T_{STG}	Junction & Storage Temperature Range		-55 to 150	°C

Electrical Characteristics (T_J = 25°C unless otherwise specified)

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
Off Characteristics						
$V_{(BR)DSS}$	Drain-Source Breakdown Voltage	I_D = 250μA, V_{GS} = 0V	60	-	-	V
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS} = 60V, V_{GS} = 0V	-	-	1.0	μA
I_{GSS}	Gate-Body Leakage Current	V_{DS} = 0V, V_{GS} = ±20V	-	-	±100	nA
On Characteristics						
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS} = V_{GS}, I_D = 250μA	1	1.7	2.5	V
$R_{DS(ON)}$	Static Drain-Source ON-Resistance(3)	V_{GS} = 10V, I_D = 30A	-	2.5	3.3	mΩ
		V_{GS} = 4.5V, I_D = 20A	-	3.2	4.2	mΩ
Dynamic Characteristics						
C_{iss}	Input Capacitance	V_{GS} = 0V, V_{DS} = 25V, f = 1MHz	-	5300	-	pF
C_{oss}	Output Capacitance		-	2150	-	pF
C_{rss}	Reverse Transfer Capacitance		-	125	-	pF
Q_g	Total Gate Charge	V_{GS} = 0 to 10V V_{DS} = 30V, I_D = 30A	-	101	-	nC
Q_{gs}	Gate Source Charge		-	17	-	nC
Q_{gd}	Gate Drain("Miller") Charge		-	22	-	nC
Switching Characteristics						
$t_{d(on)}$	Turn-On DelayTime	V_{GS} = 10V, V_{DD} = 30V I_D= 30A, R_{GEN} = 3Ω	-	16	-	ns
t_r	Turn-On Rise Time		-	38	-	ns
$t_{d(off)}$	Turn-Off DelayTime		-	78	-	ns
t_f	Turn-Off Fall Time		-	95	-	ns
Drain-Source Diode Characteristics and Max Ratings						
I_S	Maximum Continuous Drain to Source Diode Forward Current		-	-	170	A
I_{SM}	Maximum Pulsed Drain to Source Diode Forward Current		-	-	680	A
V_{SD}	Drain to Source Diode Forward Voltage	V_{GS} = 0V, I_S = 30A	-	-	1.2	V
trr	Body Diode Reverse Recovery Time	I_F = 30A, di/dt = 100A/us	-	54.7	-	ns
Qrr	Body Diode Reverse Recovery Charge		-	60	-	nC

Notes: 1. Repetitive Rating: Pulse Width Limited by Maximum Junction Temperature.

2. E_{AS} condition: Starting T_J=25°C, V_{DD}=30V, V_G=10V, R_G=25ohm, L=0.5mH, I_{AS}=38A

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

Typical Performance Characteristics

Figure 1: Output Characteristics

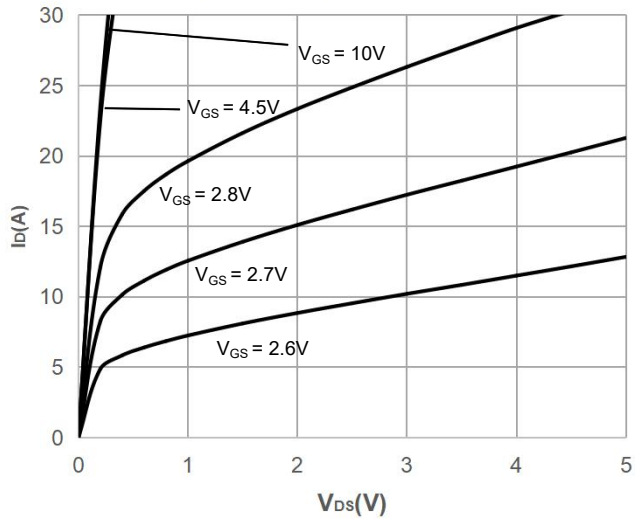


Figure 2: Typical Transfer Characteristics

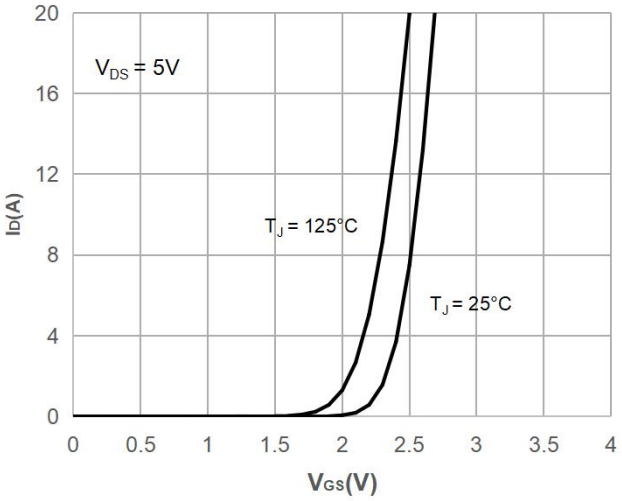


Figure 3: On-resistance vs. Drain Current

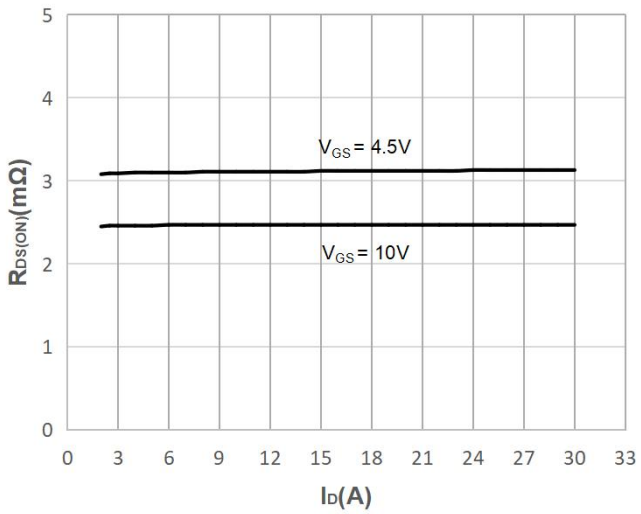


Figure 4: Body Diode Characteristics

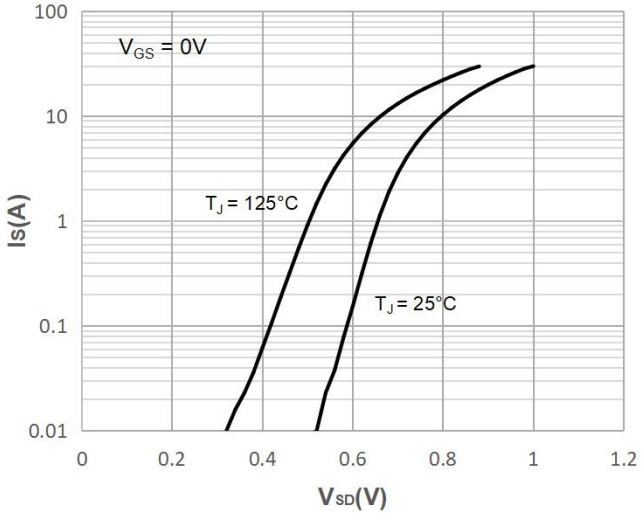


Figure 5: Gate Charge Characteristics

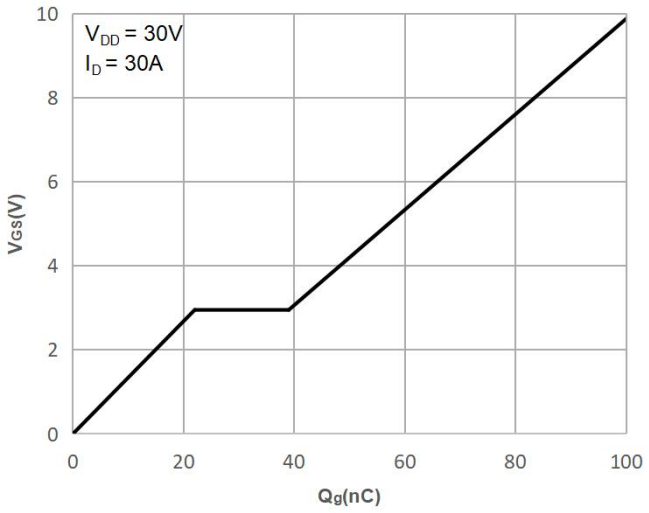
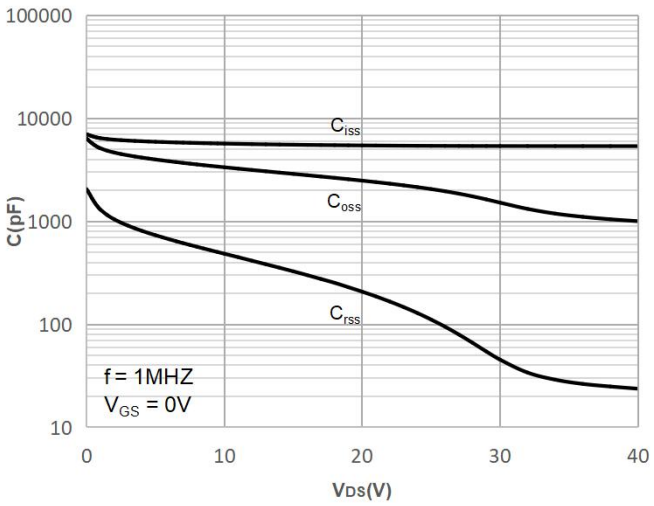


Figure 6: Capacitance Characteristics



Typical Performance Characteristics

Figure 7: Normalized Breakdown voltage vs. Junction Temperature

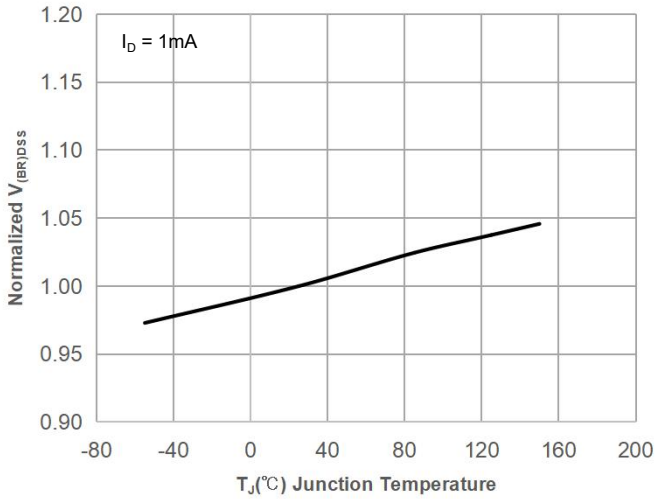


Figure 8: Normalized on Resistance vs. Junction Temperature

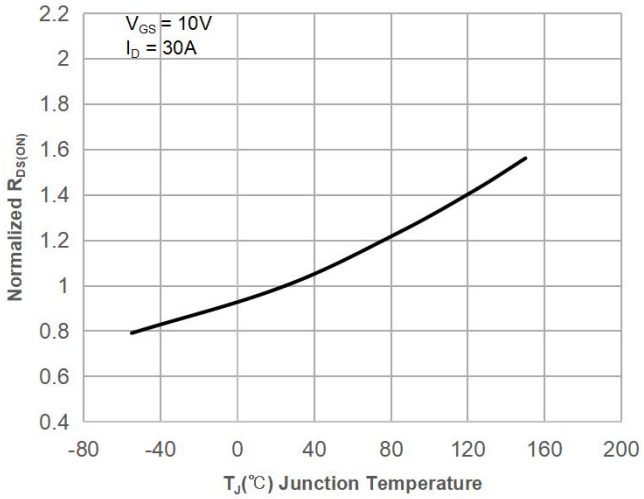


Figure 9: Maximum Safe Operating Area

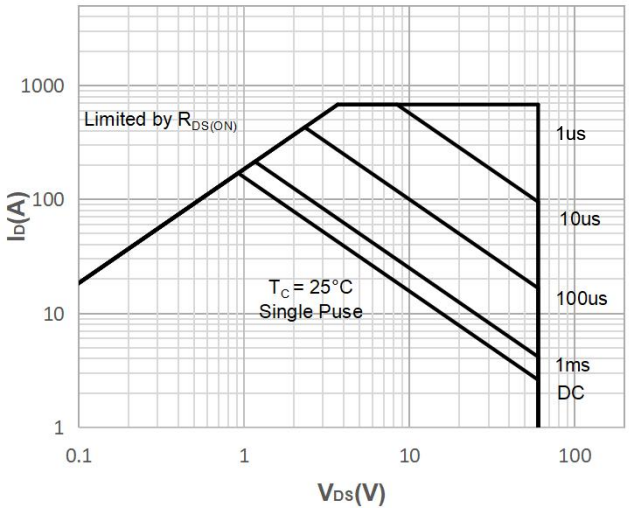


Figure 10: Maximum Continuous Drian Current vs. Case Temperature

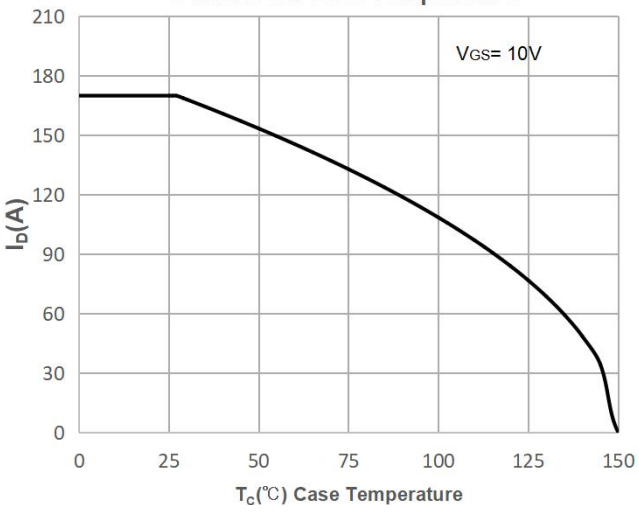


Figure 11: Normalized Maximum Transient Thermal Impedance

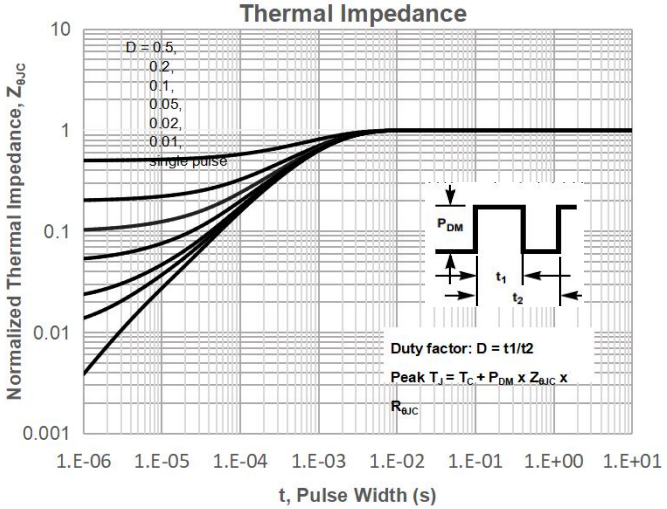
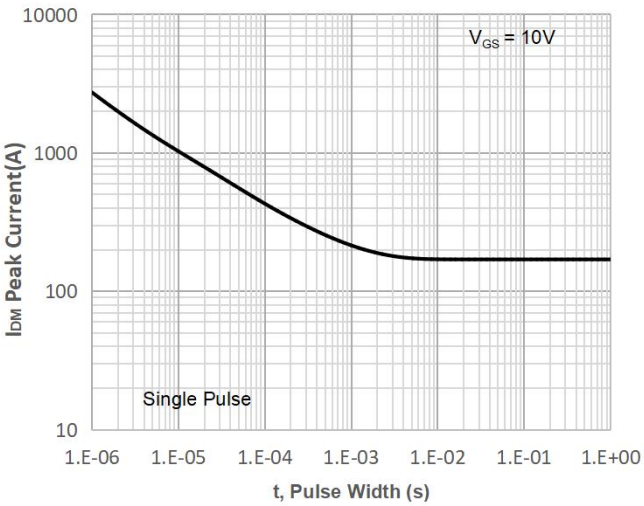


Figure 12: Peak Current Capacity



Test Circuit

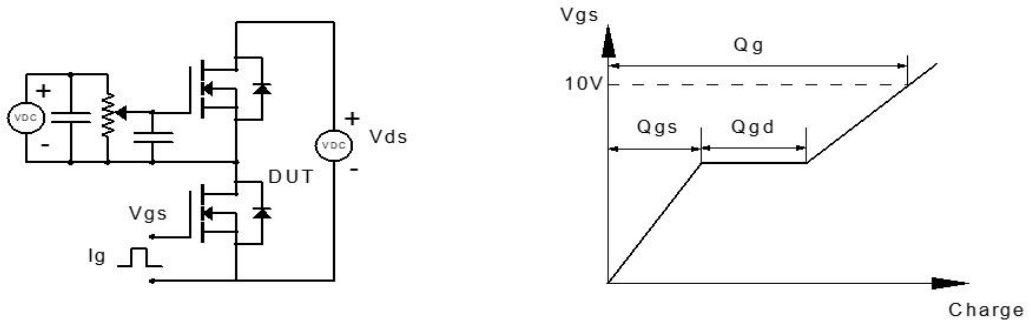


Figure 1: Gate Charge Test Circuit & Waveform

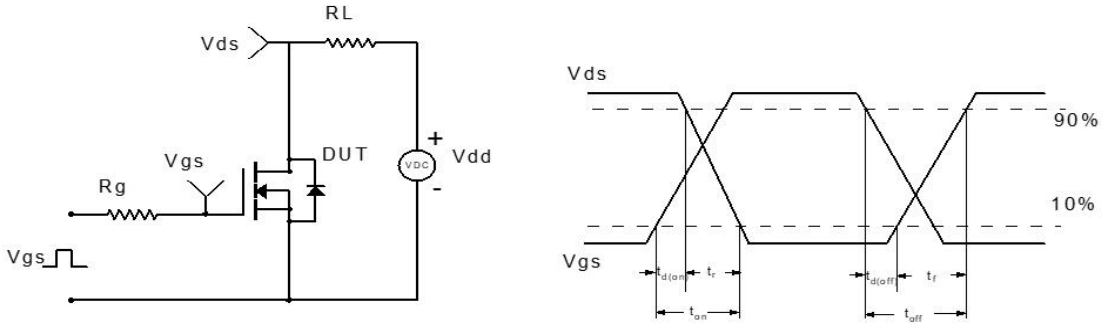


Figure 2: Resistive Switching Test Circuit & Waveform

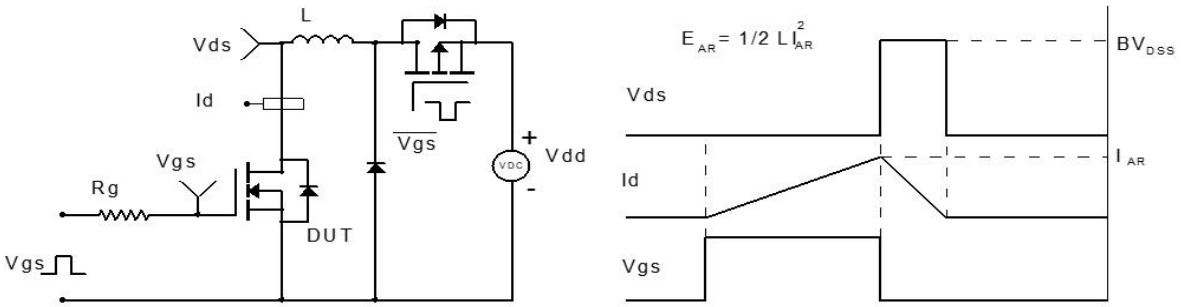


Figure 3: Unclamped Inductive Switching Test Circuit& Waveform

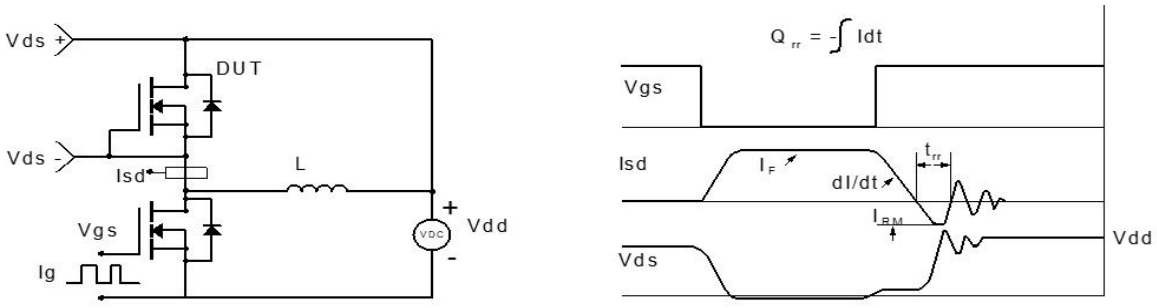
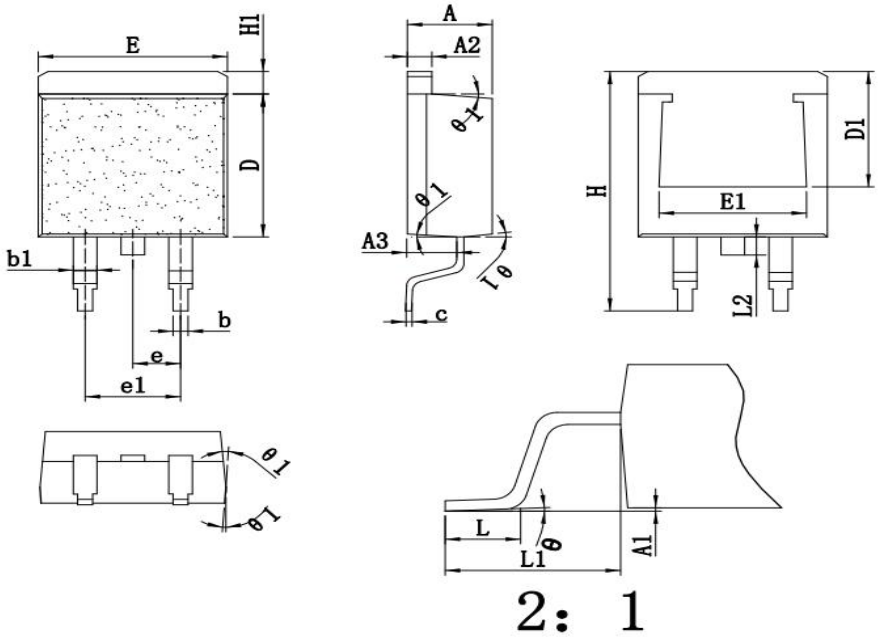


Figure 4: Diode Recovery Test Circuit & Waveform

Package Mechanical Data(TO-263-3L)



SYMBOL	mm		
	MIN	NOM	MAX
✱A	4.42	4.52	4.62
✱A1	0.00	0.10	0.20
✱A2	1.24	1.27	1.32
✱A3	2.50	2.60	2.70
✱b	0.77	0.81	0.84
✱b1	1.23	1.28	1.41
✱c	0.33	0.38	0.43
✱D	8.80	8.95	9.10
D1	7.25REF		
✱E	9.92	10.07	10.22
E1	7.85REF		
✱e	2.50	2.54	2.58
e1	5.08REF		
✱H	14.80	15.10	15.30
H1	1.12	1.28	1.42
✱L	2.10	2.23	2.36
L1	4.55	4.75	4.95
L2	1.10	1.30	1.50
✱θ	0°	2°	5°
θ1	3°	–	9°

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