CRMETL1038A

N-Channel 100V, 29mΩ Typ. Power MOSFET

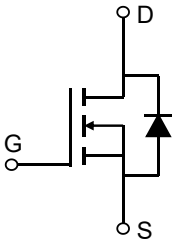
Description

Features

- 100V, 25A

  $R_{DS(ON)}$ Typ = 29mΩ @ V_{GS} = 10V

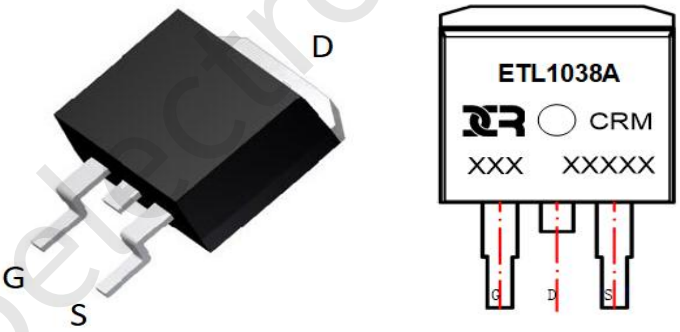
  $R_{DS(ON)}$ Typ = 31mΩ @ V_{GS} = 4.5V
- Advanced Trench Technology
- Excellent $R_{DS(ON)}$ and Low Gate Charge
- 100% UIS TESTED!
- 100% ΔVds TESTED!



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)
CRMETL1038A	CRMETL1038A	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		100	V
V_{GS}	Gate-to-Source Voltage		±20	V
I_D	Continuous Drain Current	T_C = 25°C	25	A
		T_C = 100°C	15	A
I_{DM}	Pulsed Drain Current [1]		100	A
E_{AS}	Single Pulsed Avalanche Energy [2]		64	mJ
P_D	Power Dissipation	T_C = 25°C	44.5	W
$R_{\theta JC}$	Thermal Resistance, Junction to Case		2.8	°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	100	-	-	V
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS} = 100V, 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	1.2	1.7	2.3	V
$R_{DS(ON)}$	Static Drain-Source ON-Resistance(3)	V_{GS} = 10V, I_D = 15A	-	29	38	mΩ
		V_{GS} = 4.5V, I_D = 10A	-	31	40	mΩ
Dynamic Characteristics						
C_{iss}	Input Capacitance	V_{GS} = 0V, V_{DS} = 25V, f = 1MHz	-	2550	-	pF
C_{oss}	Output Capacitance		-	100	-	pF
C_{rss}	Reverse Transfer Capacitance		-	88	-	pF
Q_g	Total Gate Charge	V_{GS} = 0 to 10V, V_{DS} = 25V, I_D = 15A	-	66	-	nC
Q_{gs}	Gate Source Charge		-	10	-	nC
Q_{gd}	Gate Drain("Miller") Charge		-	14	-	nC
Switching Characteristics						
$t_{d(on)}$	Turn-On DelayTime	V_{GS} = 10V, V_{DD} = 30V, I_D= 25A, R_{GEN} = 1.8Ω	-	11	-	ns
t_r	Turn-On Rise Time		-	45	-	ns
$t_{d(off)}$	Turn-Off DelayTime		-	67	-	ns
t_f	Turn-Off Fall Time		-	48	-	ns
Drain-Source Diode Characteristics and Max Ratings						
I_S	Maximum Continuous Drain to Source Diode Forward Current		-	-	25	A
I_{SM}	Maximum Pulsed Drain to Source Diode Forward Current		-	-	100	A
V_{SD}	Drain to Source Diode Forward Voltage	V_{GS} = 0V, I_S = 15A	-	-	1.2	V
trr	Body Diode Reverse Recovery Time	I_F = 25A, di/dt = 100A/us	-	28	-	ns
Qrr	Body Diode Reverse Recovery Charge		-	40	-	nC

Notes:

1. Repetitive Rating: Pulse Width Limited by Maximum Junction Temperature.
2. E_{AS} condition: Starting T_J=25°C, V_{DD}=50V, V_G=10V, R_G=25ohm, L=0.5mH, I_{AS}=16A
3. Pulse Test: Pulse Width≤300μs, Duty Cycle≤0.5%.

Test Circuit

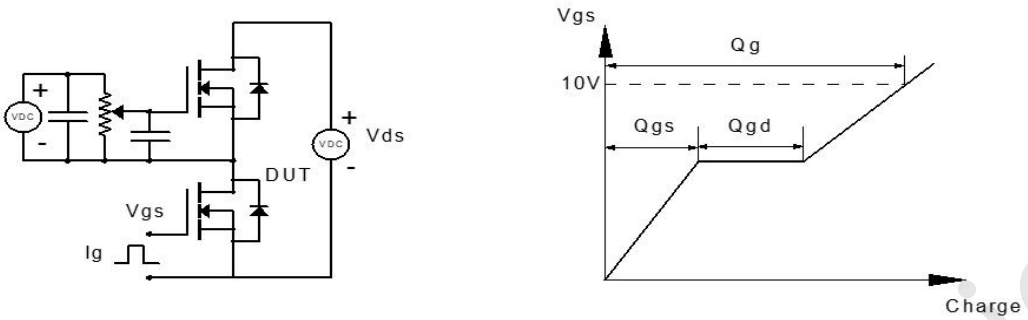


Figure 1: Gate Charge Test Circuit & Waveform

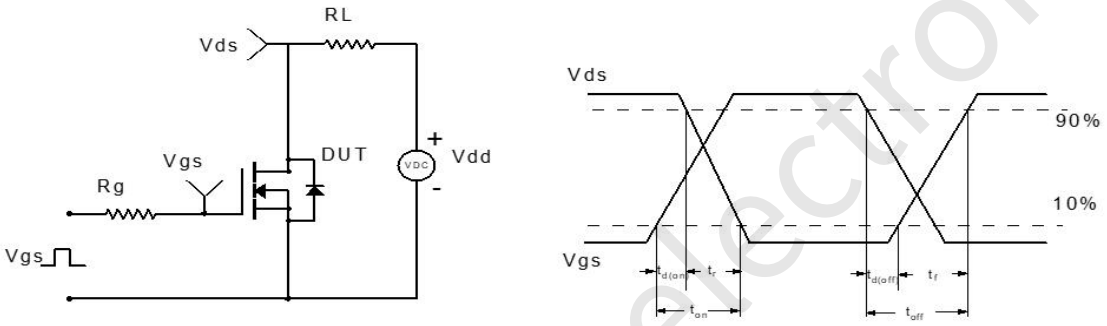


Figure 2: Resistive Switching Test Circuit & Waveform

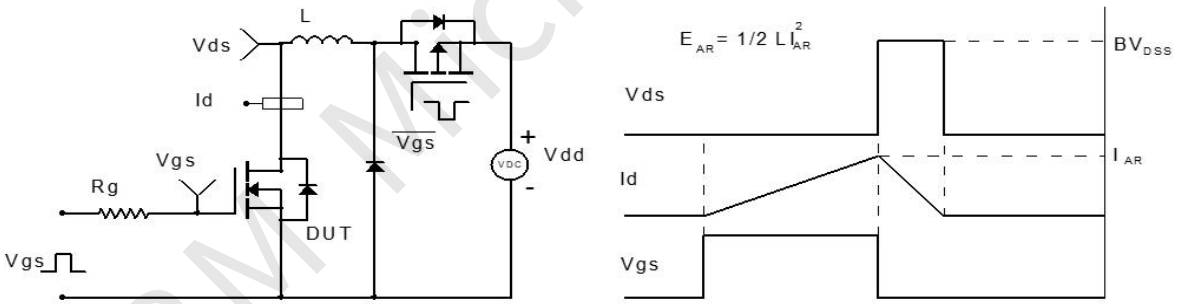


Figure 3: Unclamped Inductive Switching Test Circuit& Waveform

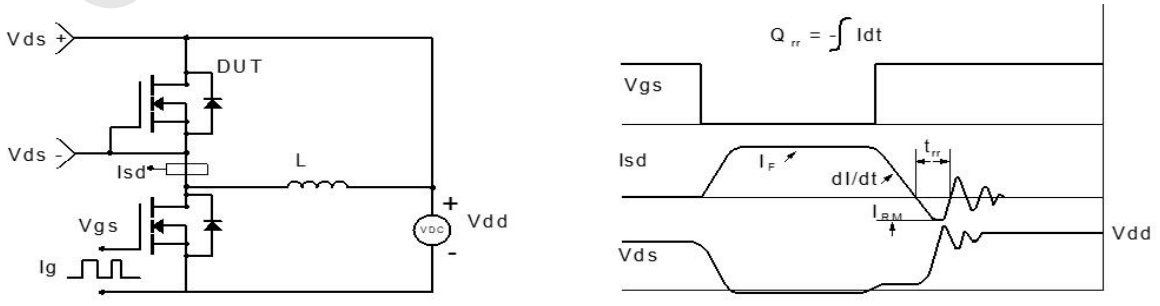
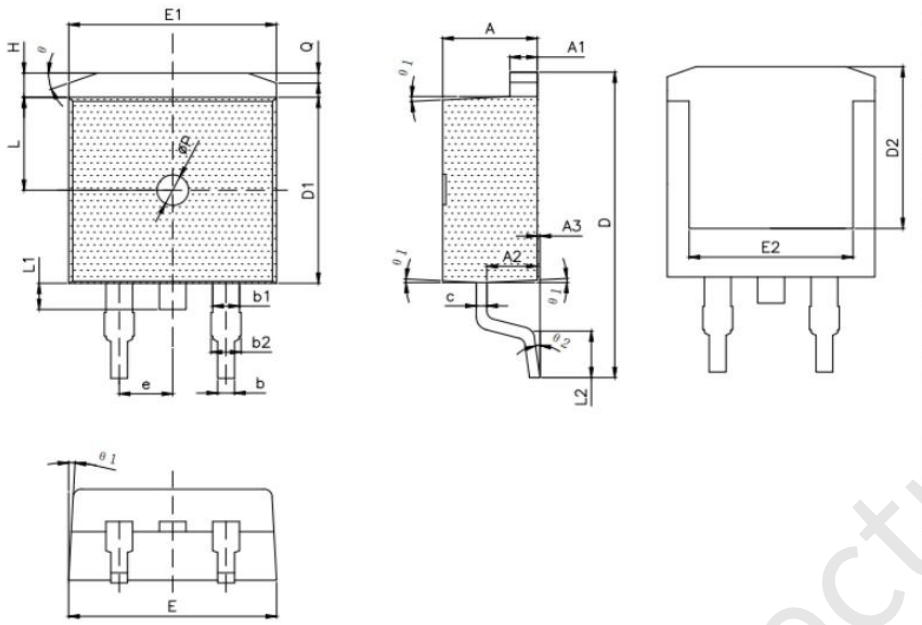


Figure 4: Diode Recovery Test Circuit & Waveform

Package Mechanical Data(TO-263-3L)



SYMBOL	MILLIMETER		
	MIN	NOM	MAX
A	4.40	4.50	4.60
A1	1.20	1.30	1.40
A2	2.30	2.40	2.50
A3	0.03	0.13	0.23
b	0.70	0.80	0.90
b1	1.21	1.27	1.40
b2	1.25	1.35	1.45
c	0.40	0.50	0.60
D	14.80	15.10	15.40
D1	9.10	9.20	9.30
D2	8.00	--	--
E	9.70	9.90	10.20
E1	9.68	9.88	10.08
E2	7.80	--	--
e	2.54 (BSC)		
H	1.00	1.20	1.40
L	4.30	4.60	4.90
L1	1.10	1.30	1.50
L2	2.10	2.30	2.50
ΦP	1.40	1.50	1.60
Q	0.50 (REF)		
θ	16°	20°	24°
θ1	1°	3°	5°
θ2	0°	–	9°

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