祥瑞微 CRM Microelectronics

CRMSGH1001A

N-Channel 100V,1.5mΩ Typ. Power MOSFET

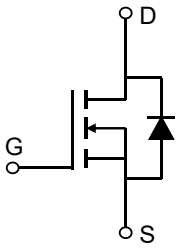
Description

Features

- 100V, 325A

  $R_{DS(ON)}$ Typ = 1.5mΩ @ V_{GS} = 10V

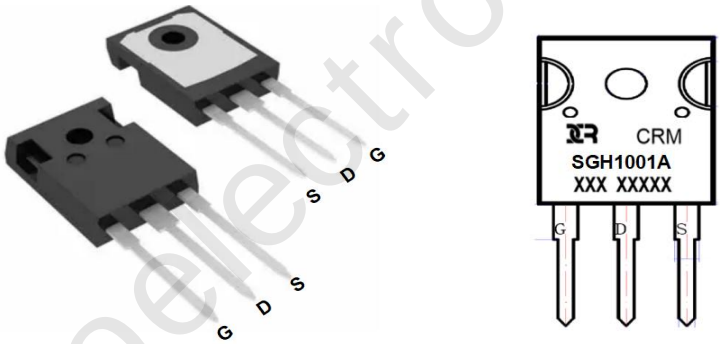
  Advanced Split Gate Trench Technology
- Excellent $R_{DS(ON)}$ and Low Gate Charge
- 100% UIS TESTED!
- 100% ΔVds TESTED!



Schematic Diagram

Application

- Load Switch
- PWM Application
- Power Management



Marking and Pin Assignment

Package Marking and Ordering Information

Device	Marking	Package	Outline	TUBE(pcs)	Inner Box (pcs)	Per Carton (pcs)
CRMSGH1001A	CRMSGH1001A	TO-247-3L	TUBE	30	600	3000

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	325	A
		T_C = 100°C	195	A
I_{DM}	Pulsed Drain Current (1)		1300	A
E_{AS}	Single Pulsed Avalanche Energy (2)		1225	mJ
P_D	Power Dissipation	T_C = 25°C	368	W
$R_{\theta JC}$	Thermal Resistance, Junction to Case		0.34	°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	2.4	3	3.6	V
$R_{DS(ON)}$	Static Drain-Source ON-Resistance(3)	V_{GS} = 10V, I_D = 30A	-	1.5	1.9	mΩ
Dynamic Characteristics						
C_{iss}	Input Capacitance	V_{GS} = 0V, V_{DS} = 50V, f = 100KHz	-	9080	-	pF
C_{oss}	Output Capacitance		-	3509	-	pF
C_{rss}	Reverse Transfer Capacitance		-	79	-	pF
Q_g	Total Gate Charge	V_{GS} = 0 to 10V V_{DS} = 50V, I_D =100A	-	160	-	nC
Q_{gs}	Gate Source Charge		-	55	-	nC
Q_{gd}	Gate Drain("Miller") Charge		-	38	-	nC
Switching Characteristics						
$t_{d(on)}$	Turn-On DelayTime	V_{GS} = 10V, V_{DD} = 50V I_D= 100A, R_{GEN} = 3Ω	-	30	-	ns
t_r	Turn-On Rise Time		-	80	-	ns
$t_{d(off)}$	Turn-Off DelayTime		-	82	-	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		-	-	325	A
I_{SM}	Maximum Pulsed Drain to Source Diode Forward Current		-	-	1300	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 = 100A, di/dt = 100A/us	-	85	-	ns
Qrr	Body Diode Reverse Recovery Charge		-	180	-	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}=70A
3. Pulse Test: Pulse Width≤300μs, Duty Cycle≤0.5%.

Test Circuit

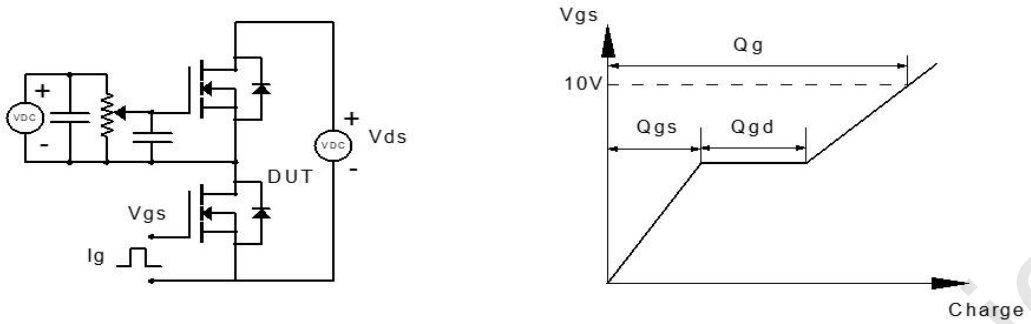


Figure 1: Gate Charge Test Circuit & Waveform

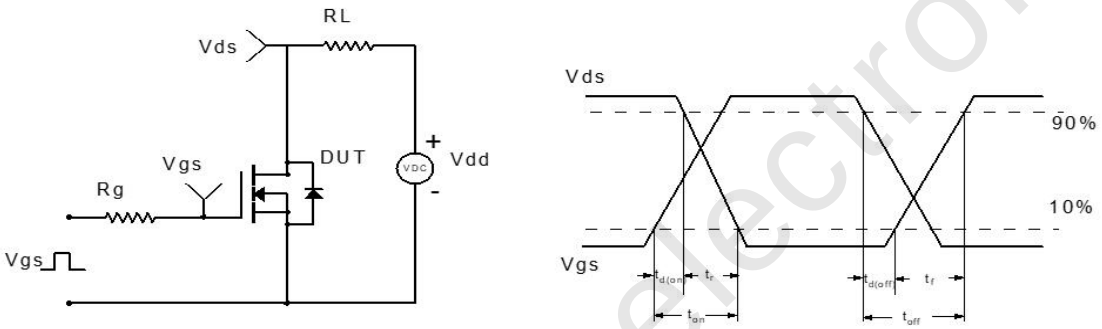


Figure 2: Resistive Switching Test Circuit & Waveform

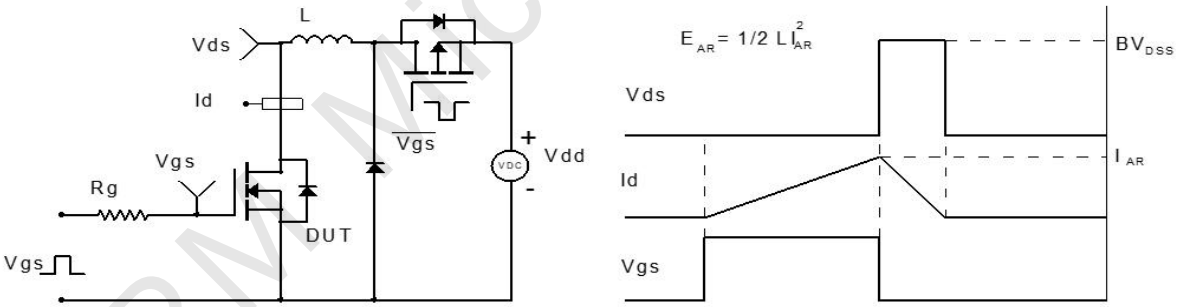


Figure 3: Unclamped Inductive Switching Test Circuit& Waveform

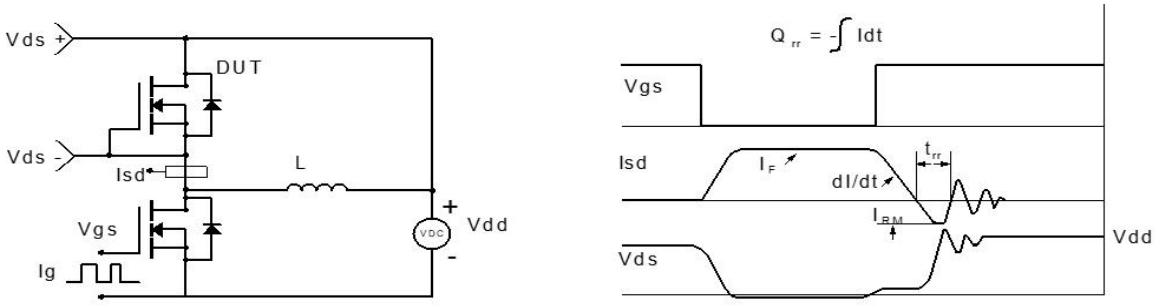
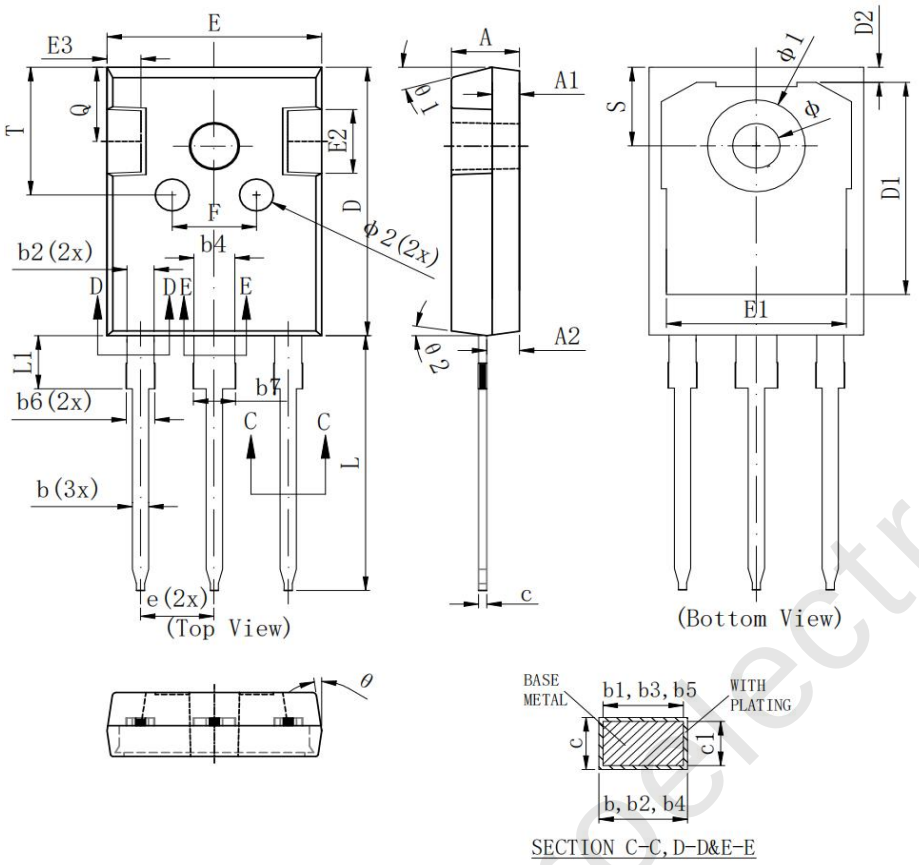


Figure 4: Diode Recovery Test Circuit & Waveform

Package Mechanical Data(TO-247-3L)



SYMBOL	MILLIMETER		
	MIN	Typ.	MAX
A	4.900	5.000	5.100
A1	1.900	2.000	2.100
A2	2.300	2.400	2.500
b	1.160	-	1.260
b1	1.150	1.200	1.220
b2	1.960	-	2.060
b3	1.950	2.000	2.020
b4	2.960	-	3.060
b5	2.950	3.000	3.020
b6	2.000	2.100	2.250
b7	3.000	3.100	3.250
c	0.590	-	0.660
c1	0.580	0.600	0.620
D	20.900	21.000	21.100
D1	16.250	16.550	16.850
D2	1.052	1.202	1.352
E	15.700	15.800	15.900
E1	13.060	13.260	13.460
E2	4.900	5.000	5.100
E3	2.400	2.500	2.600
e	5.440 BSC		
F	6.000	6.200	6.400
L	19.750	19.950	20.150
L1	-	-	4.300
φ	3.500	3.600	3.700
φ1	-	-	7.400
φ2	2.400	2.500	2.600
Q	5.600	5.800	6.000
S	6.180 BSC		
T	9.800	10.000	10.200
θ	8° REF		
θ1	15° REF		
θ2	8° REF		

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