CRMFGL1005A

N-Channel 100V, 4.5mΩ Typ. Power MOSFET

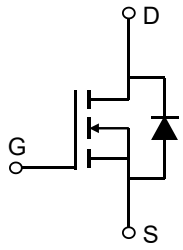
Description

Features

- 100V, 62A

  $R_{DS(ON)}$ Typ = 4.5mΩ @ V_{GS} = 10V

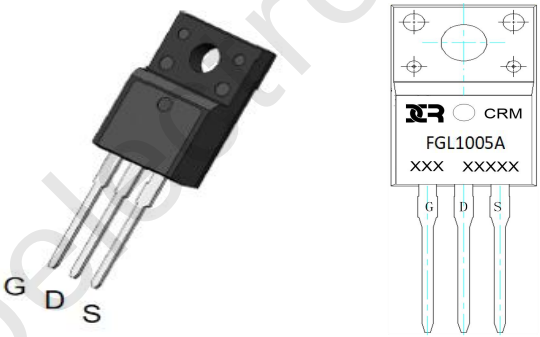
  $R_{DS(ON)}$ Typ = 5.7mΩ @ V_{GS} = 4.5V
- Advanced Split Gate Trench Technology
- Excellent $R_{DS(ON)}$ and Low Gate Charge
- 100% UIS TESTED!
- 100% ΔVds TESTED!



Schematic Diagram

Application

- Load Switch
- PWM Application
- Power Management



Marking and Pin Assignment

Package Marking and Ordering Information

Device	Marking	Package	Outline	TUBE (pcs)	Inner Box (pcs)	Per Carton (pcs)
CRMFGL1005A	CRMFGL1005A	TO-220F-3L	TUBE	50	1000	5000

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	62	A
		T_C = 100°C	37.2	A
I_{DM}	Pulsed Drain Current [1]		248	A
E_{AS}	Single Pulsed Avalanche Energy [2]		248	mJ
P_D	Power Dissipation	T_C = 25°C	39	W
$R_{\theta JA}$	Thermal Resistance, Junction to Ambient [3]		70	°C/W
$R_{\theta JC}$	Thermal Resistance, Junction to Case		3.2	°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	1.4	1.8	2.6	V
$R_{DS(ON)}$	Static Drain-Source ON-Resistance(4)	V_{GS} = 10V, I_D = 30A	-	4.5	5.9	mΩ
		V_{GS} = 4.5V, I_D = 25A	-	5.7	7.4	mΩ
Dynamic Characteristics						
C_{iss}	Input Capacitance	V_{GS} = 0V, V_{DS} = 25V, f = 1MHz	-	4072	-	pF
C_{oss}	Output Capacitance		-	2140	-	pF
C_{rss}	Reverse Transfer Capacitance		-	56	-	pF
Q_g	Total Gate Charge	V_{GS} = 0 to 10V V_{DS} = 50V, I_D = 20A	-	55	-	nC
Q_{gs}	Gate Source Charge		-	20	-	nC
Q_{gd}	Gate Drain("Miller") Charge		-	12	-	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		-	20	-	ns
$t_{d(off)}$	Turn-Off DelayTime		-	30	-	ns
t_f	Turn-Off Fall Time		-	17	-	ns
Drain-Source Diode Characteristics and Max Ratings						
I_S	Maximum Continuous Drain to Source Diode Forward Current		-	-	62	A
I_{SM}	Maximum Pulsed Drain to Source Diode Forward Current		-	-	248	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 = 20A, di/dt = 100A/us	-	60	-	ns
Qrr	Body Diode Reverse Recovery Charge		-	120	-	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}=31.5A
3. $R_{\theta JA}$ is measured with the device mounted on a 1inch^2 pad of 2oz copper FR4 PCB
4. Pulse Test: Pulse Width≤300μs, Duty Cycle≤0.5%.

Test Circuit

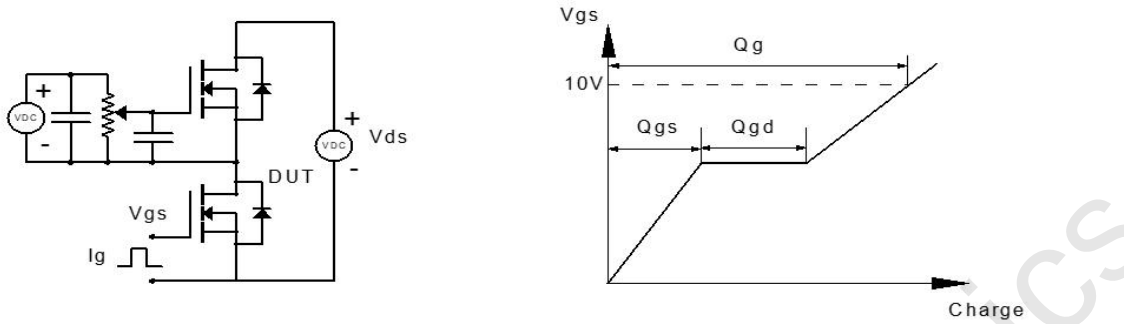


Figure 1: Gate Charge Test Circuit & Waveform

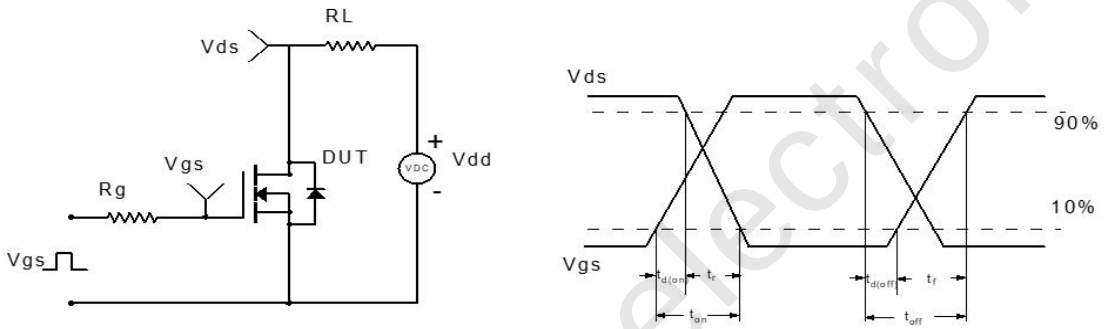


Figure 2: Resistive Switching Test Circuit & Waveform

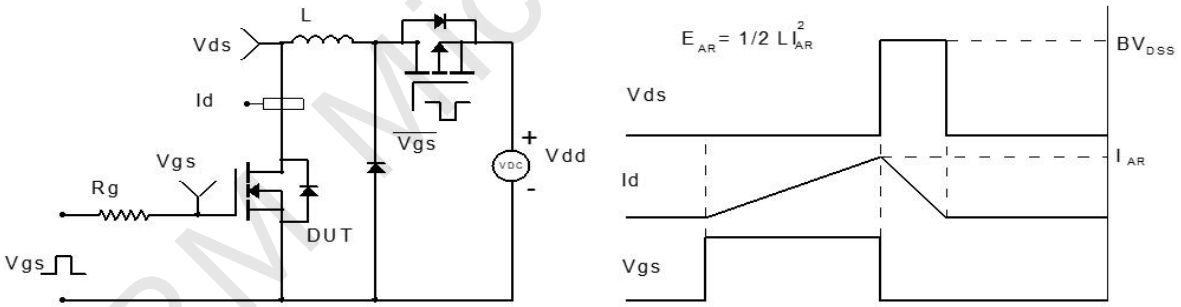


Figure 3: Unclamped Inductive Switching Test Circuit& Waveform

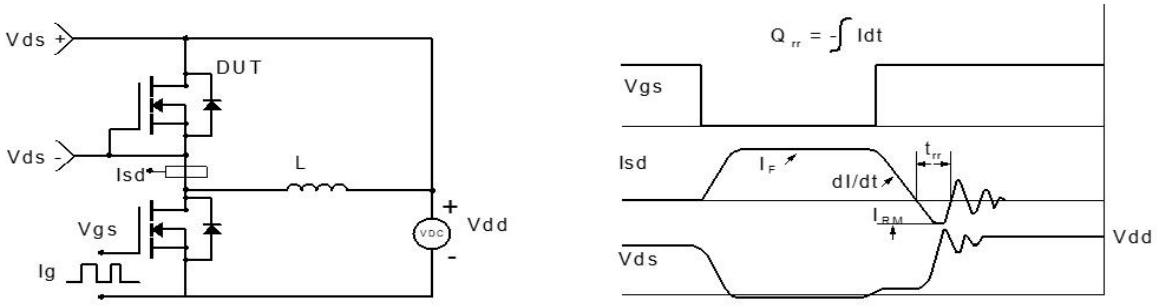
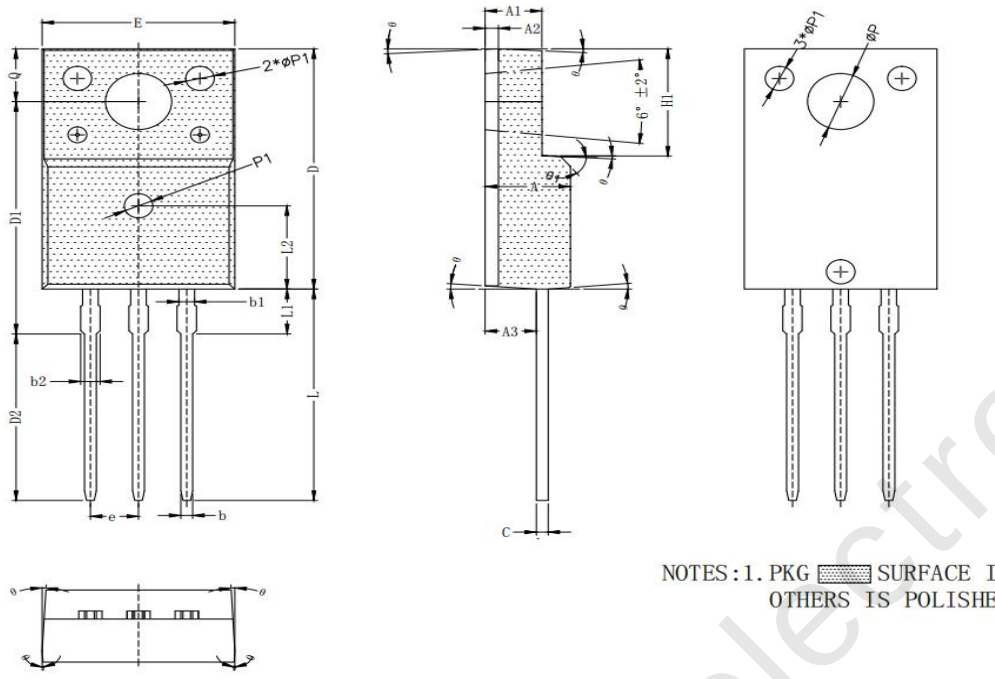


Figure 4: Diode Recovery Test Circuit & Waveform

Package Mechanical Data(TO-220F-3L)



SYMBOL	MILLIMETER		
	MIN	NOM	MAX
A	4.50	4.70	4.83
A1	2.34	2.54	2.74
A2		0.70REF	
A3	2.56	2.76	2.93
b	0.70	--	0.90
b1	1.18	--	1.38
b2	--	--	1.47
c	0.45	0.50	0.60
D	15.67	15.87	16.07
D1	15.55	15.75	15.95
D2	9.60	9.80	10.00
E	9.96	10.16	10.36
e		2.54BSC	
H1	6.48	6.68	6.88
L	12.68	12.98	13.28
L1	3.10	3.20	3.30
L2		6.50REF	
ΦP	3.08	3.18	3.28
ΦP1	1.40	1.50	1.60
Q	3.20	--	3.40
θ	1°	5°	7°
θ1	42°	45°	48°

NOTES:1. PKG ▨ SURFACE IS MATTE Ra1.2~1.4;
OTHERS IS POLISHED Ra0.15;

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