祥瑞微 CRM Microelectronics

CRMCP40N20A

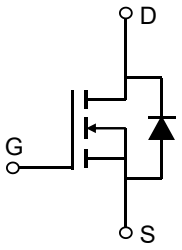
N-Channel 200V,50mΩ Typ. Power MOSFET

Description

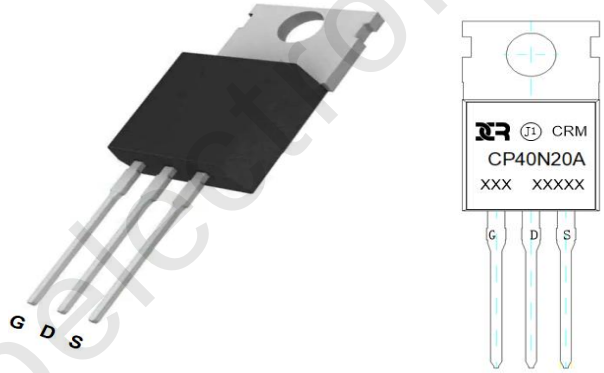
Features

- 200V, 40A

  $R_{DS(ON)}$ Typ = 50mΩ @ V_{GS} = 10V
- Fast Switching
- Improved dv/dt Capability
- 100% UIS TESTED!
- 100% ΔVds TESTED!



Schematic Diagram



Marking and Pin Assignment

Application

- Switch Mode Power Supply(SMPS)
- Uninterruptible Power Supply(UPS)

Package Marking and Ordering Information

Device	Marking	Package	Outline	TUBE(pcs)	Inner Box (pcs)	Per Carton (pcs)
CRMCP40N20A	CRMCP40N20A	TO-220C-3L	TUBE	50	2000	8000

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

Symbol	Parameter		Value	Units
V_{DS}	Drain-to-Source Voltage		200	V
V_{GS}	Gate-to-Source Voltage		±20	V
I_D	Continuous Drain Current	T_C = 25°C	40	A
		T_C = 100°C	24	A
I_{DM}	Pulsed Drain Current (1)		160	A
E_{AS}	Single Pulsed Avalanche Energy (2)		484	mJ
P_D	Power Dissipation	T_C = 25°C	250	W
$R_{\theta JC}$	Thermal Resistance, Junction to Case		0.5	°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	200	-	-	V
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS} = 200V, 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	2.8	4	V
$R_{DS(ON)}$	Static Drain-Source ON-Resistance(3)	V_{GS} = 10V, I_D = 20A	-	50	65	mΩ
Dynamic Characteristics						
C_{iss}	Input Capacitance	V_{GS} = 0V, V_{DS} = 25V, f = 1MHz	-	2894	-	pF
C_{oss}	Output Capacitance		-	333	-	pF
C_{rss}	Reverse Transfer Capacitance		-	95	-	pF
Q_g	Total Gate Charge	V_{GS} = 0 to 10V V_{DS} = 160V, I_D =40A	-	112	-	nC
Q_{gs}	Gate Source Charge		-	11	-	nC
Q_{gd}	Gate Drain("Miller") Charge		-	51	-	nC
Switching Characteristics						
$t_{d(on)}$	Turn-On DelayTime	V_{GS} = 15V, V_{DD} = 100V I_D= 40A, R_{GEN} = 5Ω	-	30	-	ns
t_r	Turn-On Rise Time		-	40	-	ns
$t_{d(off)}$	Turn-Off DelayTime		-	480	-	ns
t_f	Turn-Off Fall Time		-	110	-	ns
Drain-Source Diode Characteristics and Max Ratings						
I_S	Maximum Continuous Drain to Source Diode Forward Current		-	-	40	A
I_{SM}	Maximum Pulsed Drain to Source Diode Forward Current		-	-	160	A
V_{SD}	Drain to Source Diode Forward Voltage	V_{GS} = 0V, I_S = 20A	-	-	1.2	V
trr	Body Diode Reverse Recovery Time	I_F = 20A, di/dt = 100A/us	-	1.45	-	ns
Qrr	Body Diode Reverse Recovery Charge		-	1.1	-	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}=44A
3. Pulse Test: Pulse Width≤300μs, Duty Cycle≤0.5%.

Test Circuit

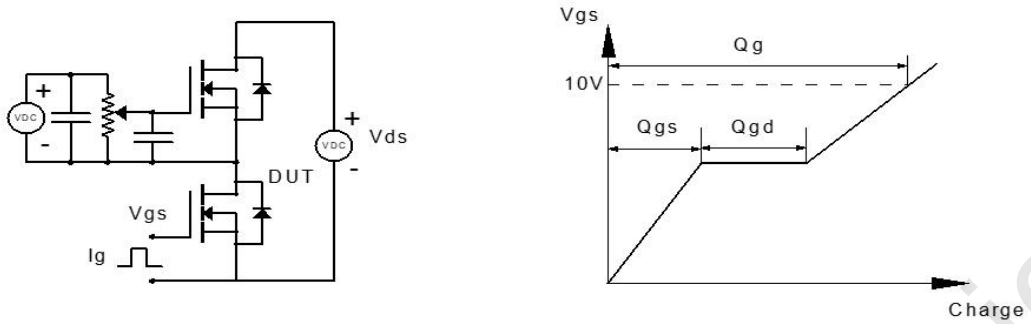


Figure 1: Gate Charge Test Circuit & Waveform

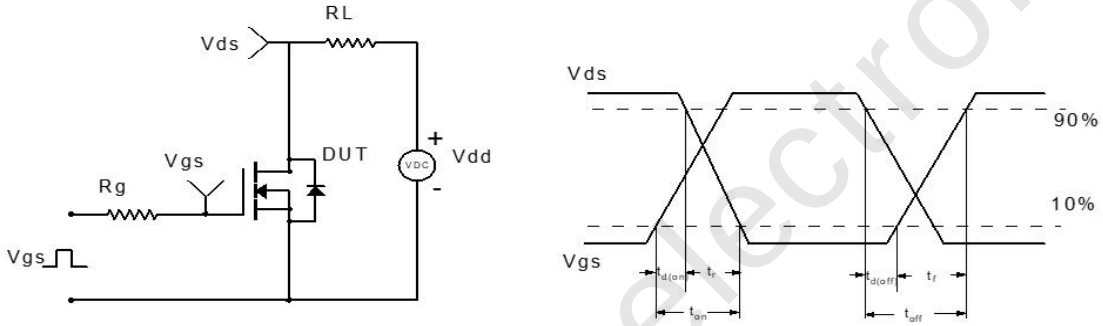


Figure 2: Resistive Switching Test Circuit & Waveform

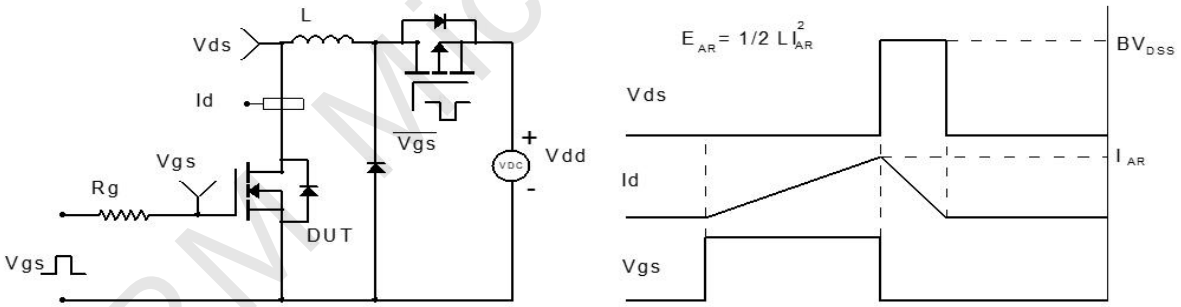


Figure 3: Unclamped Inductive Switching Test Circuit& Waveform

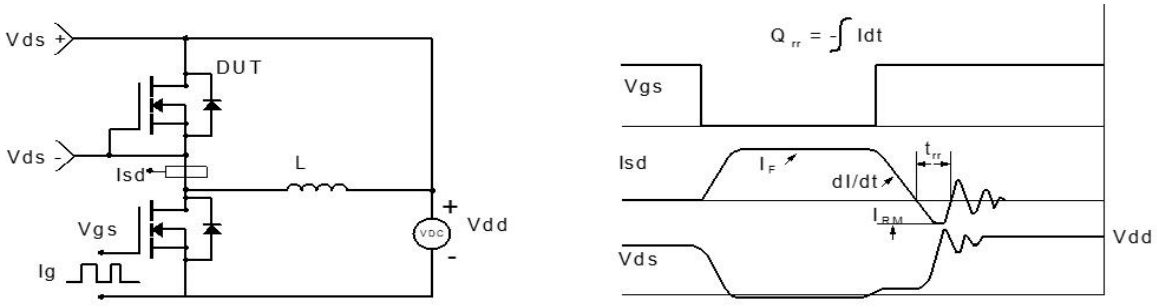
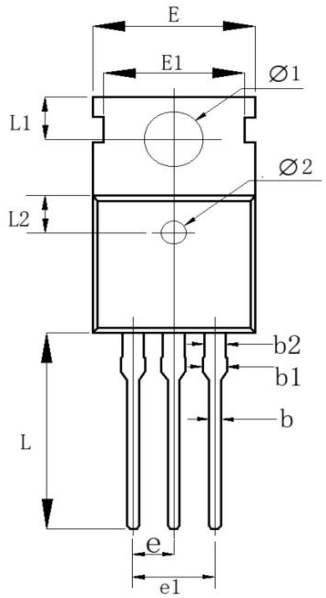
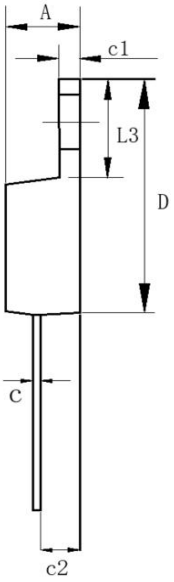


Figure 4: Diode Recovery Test Circuit & Waveform

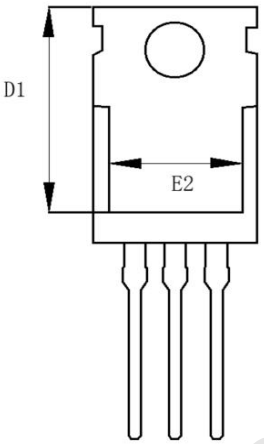
Package Mechanical Data(TO-220C-3L)



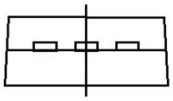
TOP VIEW



SIDE VIEW



BOTTOM VIEW



SIDE VIEW

COMMON DIMENSIONS (UNITS OF MEASURE=mm)			
SYMBOL	MIN	NOM	MAX
A	4.30	4.50	4.70
b	0.70	0.80	0.90
b1	——	——	1.42
b2	1.17	1.27	1.37
c	0.40	0.50	0.60
c1	1.25	1.30	1.35
c2	2.20	2.40	2.60
D	15.45	15.65	15.85
D1	13.20	13.40	13.60
E	9.80	10.00	10.20
E1	8.60	8.70	8.80
E2	7.80	8.00	8.20
e1	4.88	5.08	5.28
L	12.95	13.15	13.35
L1	2.70	2.80	2.90
L2	2.40	2.50	2.60
L3	6.30	6.50	6.70
Ø1	3.50	3.60	3.70
Ø2	1.35	1.50	1.65
e	2.54BSC		

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