CRMQTL0413AD

Description

N-channel Enhancement Mode Power MOSFET

Features

• 40V, 35A

 $R_{DS(ON)}$ Typ= $11m\Omega$ @ V_{GS} = 10V $R_{DS(ON)}$ Typ= $14.5m\Omega$ @ V_{GS} = 4.5V

- Advanced Trench Technology
- Excellent R_{DS(ON)} and Low Gate Charge

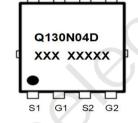
Applications

- Load Switch
- PWM Application
- Power Management

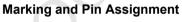
100% UIS TESTED! 100% ΔVds TESTED!

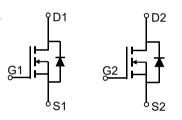






D1 D1 D2 D2





Schematic Diagram

Package Marking and Ordering Information

Device Marking	Device	Outline	Package	Reel Size	Reel(pcs)	Per Carton (pcs)
Q130N04D	CRMQTL0413AD	TAPING	PDFN3.3x3.3-8L-D	13"	5000	50000

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

Symbol	Parameter		Value	Units
V _{DS}	Drain-to-Source Voltage		40	V
V _{GS}	Gate-to-Source Voltage		±20	V
	Outline Desire Outline	T _C = 25°C	35	А
I _D	Continuous Drain Current	T _C = 100°C	21	
I _{DM}	Pulsed Drain Current (1)		140	Α
E _{AS}	Single Pulsed Avalanche Energy ⁽²⁾		25	mJ
P _D	Power Dissipation	T _C = 25°C	28	W
$R_{\theta JC}$	Thermal Resistance, Junction to Case		4.5	°C/W
T _J , T _{STG}	Junction & Storage Temperature R	Range	-55 to 150	°C



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

Symbol	Parameter	Conditions	Min.	Тур.	Max.	Unit
Off Cha	aracteristics					
V _{(BR)DSS}	Drain-Source Breakdown Voltage	$I_D = 250 \mu A, V_{GS} = 0 V$	40	-	-	V
I _{DSS}	Zero Gate Voltage Drain Current	V _{DS} = 40V, V _{GS} = 0V	-	-	1.0	μА
I _{GSS}	Gate-Body Leakage Current	$V_{DS} = 0V, V_{GS} = \pm 20V$	-	-	±100	nA
On Cha	racteristics					
$V_{GS(th)}$	Gate Threshold Voltage	$V_{DS} = V_{GS}, I_{D} = 250 \mu A$	1.0	1.3	1.8	V
	Static Drain-Source ON-Resistance ⁽³⁾	V _{GS} = 10V, I _D = 10A	-	11.0	14.0	mΩ
$R_{DS(ON)}$		V _{GS} = 4.5V, I _D = 8A	-	14.5	19.0	mΩ
Dynami	ic Characteristics					
C _{iss}	Input Capacitance		- (1172	-	pF
C _{oss}	Output Capacitance	$V_{GS} = 0V, V_{DS} = 20V,$		104	-	pF
C _{rss}	Reverse Transfer Capacitance	f = 1MHz	-	84	-	pF
Q_g	Total Gate Charge			26	-	nC
Q_{gs}	Gate Source Charge	$V_{GS} = 0 \text{ to } 10V$ $V_{DS} = 20V, I_D = 10A$	<u> </u>	6	-	nC
Q_{gd}	Gate Drain("Miller") Charge	V _{DS} - 20V, I _D - 10A	-	5	-	nC
Switchi	ing Characteristics					
t _{d(on)}	Turn-On DelayTime	4()	-	7	-	ns
t _r	Turn-On Rise Time	$V_{GS} = 10V, V_{DD} = 20V$	-	11	-	ns
$t_{d(off)}$	Turn-Off DelayTime	I_D = 10A, R_{GEN} = 3Ω	-	26	-	ns
t _f	Turn-Off Fall Time		-	5	-	ns
Drain-S	Source Diode Characteristics and I	Max Ratings				
I _s	Maximum Continuous Drain to Source Diode Forward Current			-	35	Α
I _{SM}	Maximum Pulsed Drain to Source Diode Forward Current			-	140	А
V _{SD}	Drain to Source Diode Forward Voltage	$V_{GS} = 0V, I_{S} = 10A$	-	-	1.2	V
trr	Body Diode Reverse Recovery Time	1 404 11/14 4004/	-	10	-	ns
Qrr	Body Diode Reverse Recovery Charge	$I_F = 10A$, di/dt = 100A/us	-	6	-	nC

Notes:

- 1. Repetitive Rating: Pulse Width Limited by Maximum Junction Temperature.
- 2. E_{AS} condition: Starting T_J =25C, V_{DD} =20V, V_G =10V, R_G =25ohm, L=0.5mH, I_{AS} =10A
- 3. Pulse Test: Pulse Width $\!\! \leqslant \! 300 \mu s,$ Duty Cycle $\!\! \leqslant \! 0.5 \%.$



Test Circuit

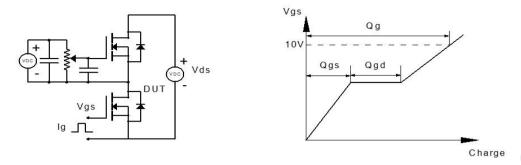


Figure 1: Gate Charge Test Circuit & Waveform

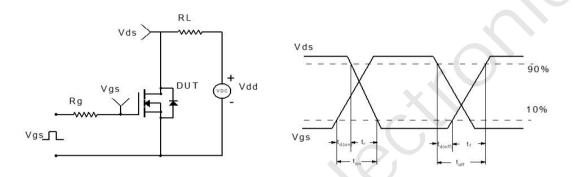


Figure 2: Resistive Switching Test Circuit & Waveform

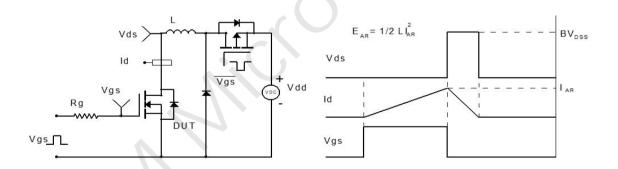


Figure 3: Unclamped Inductive Switching Test Circuit& Waveform

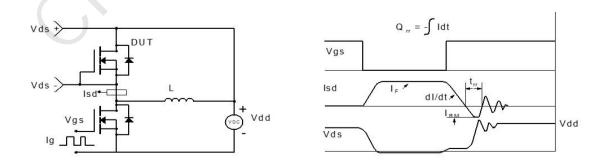
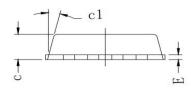


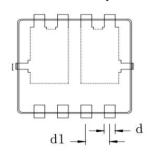
Figure 4: Diode Recovery Test Circuit & Waveform

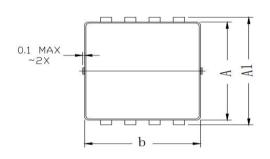


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Package Mechanical Data(PDFN3.3x3.3-8L-D)







	COMMON DIN	MENSION (MM)	
PKG	PDFN 3×3		
Symbol	MIN	MON	MAX
A	3. 070	3. 100	3. 130
A1	3. 300	3. 400	3. 500
b	3. 070	3, 100	3. 130
С	0.770	0.800	0, 830
c1		13°	
d		0.300	
d1	0.650		
Е		0.152	

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