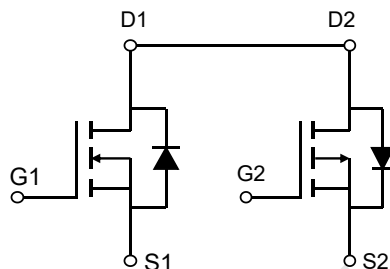


Description

Features

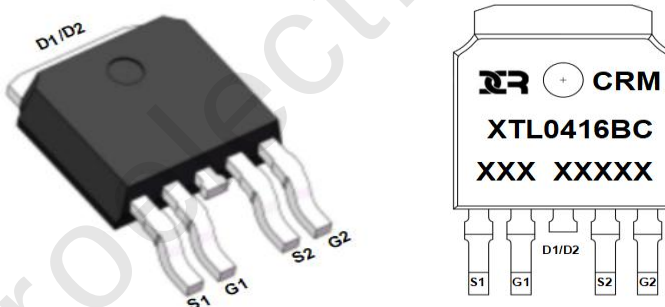
- 40V, 34A
 $R_{DS(ON)}$ Typ = 9.7m Ω @ V_{GS} = 10V
 $R_{DS(ON)}$ Typ = 13.2m Ω @ V_{GS} = 4.5V
- -40V, -24A
 $R_{DS(ON)}$ Typ = 19.2m Ω @ V_{GS} = -10V
 $R_{DS(ON)}$ Typ = 24.2m Ω @ V_{GS} = -4.5V
- Advanced Trench Technology
- Excellent $R_{DS(ON)}$ and Low Gate Charge
- 100% UIS TESTED!
- 100% ΔV_{ds} 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)
CRMXTL0416BC	CRMXTL0416BC	TO-252-4L	TAPING	13"	2500	25000

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

Symbol	Parameter	N Value	P Value	Units
V_{DS}	Drain-to-Source Voltage	40	-40	V
V_{GS}	Gate-to-Source Voltage	± 20	± 20	V
I_D	Continuous Drain Current	$T_C = 25^\circ\text{C}$	34	A
		$T_C = 100^\circ\text{C}$	20.4	A
I_{DM}	Pulsed Drain Current ⁽¹⁾	136	-96	A
E_{AS}	Single Pulsed Avalanche Energy ⁽²⁾	33	42	mJ
P_D	Power Dissipation	$T_C = 25^\circ\text{C}$	25	W
$R_{\theta JC}$	Thermal Resistance, Junction to Ambient	5	5	$^\circ\text{C/W}$
T_J, T_{STG}	Junction & Storage Temperature Range	-55 to 150		$^\circ\text{C}$

Electrical Characteristics ($T_J = 25^\circ\text{C}$ 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	40	-	-	V
I _{DSS}	Zero Gate Voltage Drain Current	V _{DS} = 40V, 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	1.5	2.2	V
R _{DS(ON)}	Static Drain-Source ON-Resistance ⁽³⁾	V _{GS} = 10V, I _D = 10A	-	9.7	12.6	mΩ
		V _{GS} = 4.5V, I _D = 5A	-	13.2	17	mΩ
Dynamic Characteristics						
C _{iss}	Input Capacitance	V _{GS} = 0V, V _{DS} = 20V, f = 1MHz	-	1201	-	pF
C _{oss}	Output Capacitance		-	95	-	pF
C _{rss}	Reverse Transfer Capacitance		-	85	-	pF
Q _g	Total Gate Charge	V _{GS} = 0 to 10V V _{DS} = 20V, I _D = 10A	-	27	-	nC
Q _{gs}	Gate Source Charge		-	7	-	nC
Q _{gd}	Gate Drain("Miller") Charge		-	6	-	nC
Switching Characteristics						
t _{d(on)}	Turn-On DelayTime	V _{GS} = 10V, V _{DD} = 20V I _D = 10A, R _{GEN} = 3Ω	-	7.5	-	ns
t _r	Turn-On Rise Time		-	12	-	ns
t _{d(off)}	Turn-Off DelayTime		-	27	-	ns
t _f	Turn-Off Fall Time		-	7	-	ns
Drain-Source Diode Characteristics and Max Ratings						
I _S	Maximum Continuous Drain to Source Diode Forward Current		-	-	34	A
I _{SM}	Maximum Pulsed Drain to Source Diode Forward Current		-	-	136	A
V _{SD}	Drain to Source Diode Forward Voltage	V _{GS} = 0V, I _S = 10A	-	-	1.2	V
trr	Body Diode Reverse Recovery Time	I _F = 10A, di/dt = 100A/us	-	11	-	ns
Qrr	Body Diode Reverse Recovery Charge		-	7	-	nC

Electrical Characteristics ($T_J = 25^\circ\text{C}$ unless otherwise specified)

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
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Off Characteristics

$V_{(BR)DSS}$	Drain-Source Breakdown Voltage	$I_D = -250\mu\text{A}$, $V_{GS} = 0\text{V}$	-40	-	-	V
I_{DSS}	Zero Gate Voltage Drain Current	$V_{DS} = -40\text{V}$, $V_{GS} = 0\text{V}$	-	-	-1.0	μA
I_{GSS}	Gate-Body Leakage Current	$V_{DS} = 0\text{V}$, $V_{GS} = \pm 20\text{V}$	-	-	± 100	nA

On Characteristics

$V_{GS(th)}$	Gate Threshold Voltage	$V_{DS} = V_{GS}$, $I_D = -250\mu\text{A}$	-1	-1.7	-2.5	V
$R_{DS(ON)}$	Static Drain-Source ON-Resistance ⁽³⁾	$V_{GS} = -10\text{V}$, $I_D = -5\text{A}$	-	19.2	25	$\text{m}\Omega$
		$V_{GS} = -4.5\text{V}$, $I_D = -4\text{A}$	-	24.2	31.5	$\text{m}\Omega$

Dynamic Characteristics

C_{iss}	Input Capacitance	$V_{GS} = 0\text{V}$, $V_{DS} = -20\text{V}$, $f = 1\text{MHz}$	-	1425	-	pF
C_{oss}	Output Capacitance		-	125	-	pF
C_{rss}	Reverse Transfer Capacitance		-	86	-	pF
Q_g	Total Gate Charge	$V_{GS} = 0$ to -10V $V_{DS} = -20\text{V}$, $I_D = -10\text{A}$	-	28	-	nC
Q_{gs}	Gate Source Charge		-	7	-	nC
Q_{gd}	Gate Drain("Miller") Charge		-	5.3	-	nC

Switching Characteristics

$t_{d(on)}$	Turn-On DelayTime	$V_{GS} = -10\text{V}$, $V_{DD} = -20\text{V}$ $I_D = -10\text{A}$, $R_{GEN} = 3\Omega$	-	7.8	-	ns
t_r	Turn-On Rise Time		-	29	-	ns
$t_{d(off)}$	Turn-Off DelayTime		-	36	-	ns
t_f	Turn-Off Fall Time		-	47	-	ns

Drain-Source Diode Characteristics and Max Ratings

I_S	Maximum Continuous Drain to Source Diode Forward Current	$V_{GS} = 0\text{V}$, $I_S = -10\text{A}$	-	-	-24	A
I_{SM}	Maximum Pulsed Drain to Source Diode Forward Current		-	-	-96	A
V_{SD}	Drain to Source Diode Forward Voltage		-	-	-1.2	V
t_{rr}	Body Diode Reverse Recovery Time		-	14	-	ns
Q_{rr}	Body Diode Reverse Recovery Charge		-	7	-	nC

- Notes:
1. Repetitive Rating: Pulse Width Limited by Maximum Junction Temperature.
 2. E_{AS} condition: Starting $T_J = 25^\circ\text{C}$, $V_{DD} = 20\text{V}$, $V_G = 10\text{V}$, $R_G = 25\Omega$, $L = 0.5\text{mH}$, $I_{AS} = 11.5\text{A}$
 E_{AS} condition: Starting $T_J = 25^\circ\text{C}$, $V_{DD} = -20\text{V}$, $V_G = -10\text{V}$, $R_G = 25\Omega$, $L = 0.5\text{mH}$, $I_{AS} = -13\text{A}$
 3. Pulse Test: Pulse Width $\leq 300\mu\text{s}$, Duty Cycle $\leq 0.5\%$.

Test Circuit

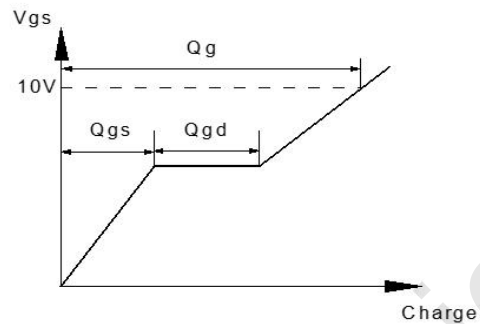
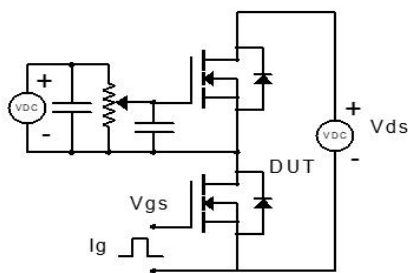


Figure 1: Gate Charge Test Circuit & Waveform

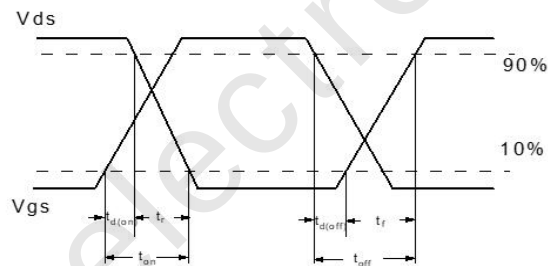
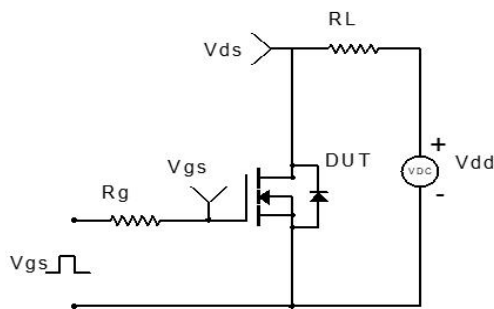


Figure 2: Resistive Switching Test Circuit & Waveform

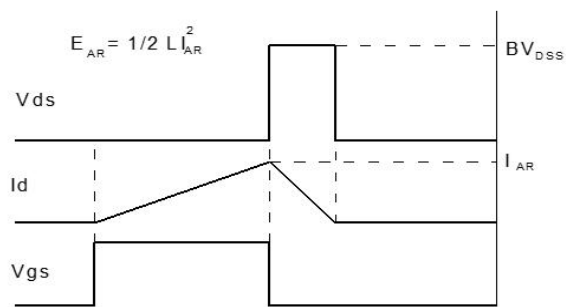
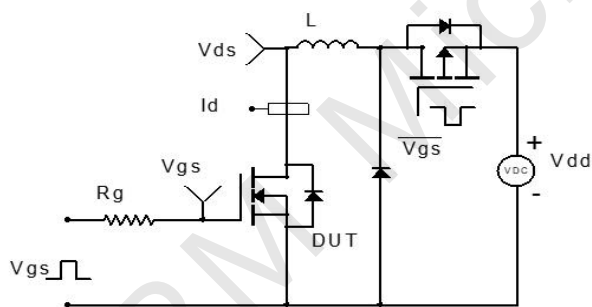


Figure 3: Unclamped Inductive Switching Test Circuit & Waveform

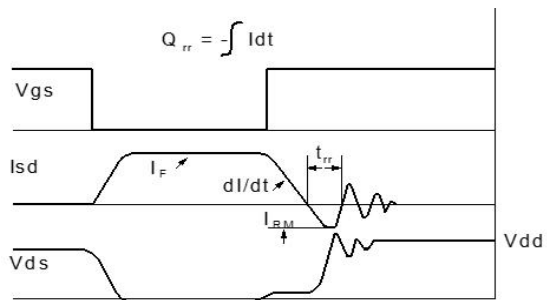
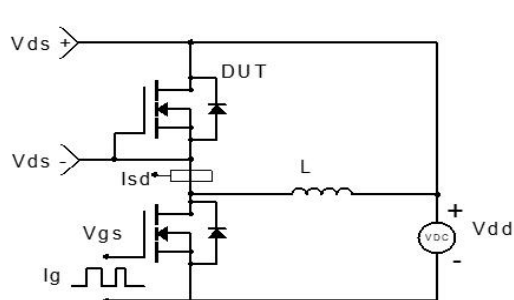
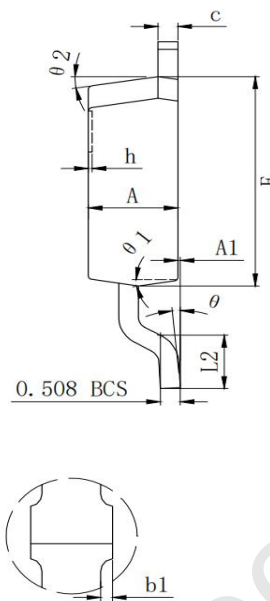
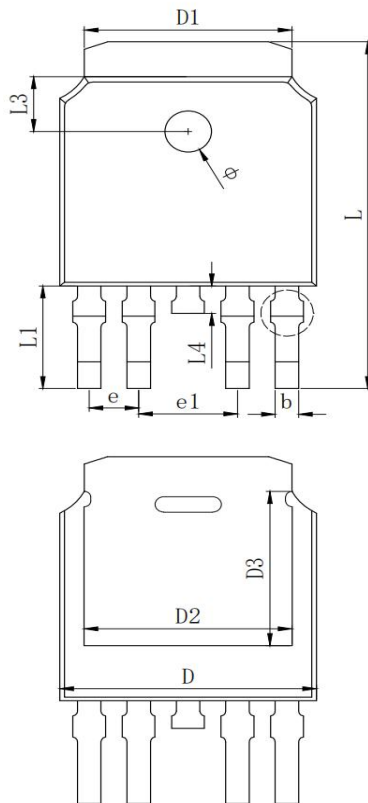


Figure 4: Diode Recovery Test Circuit & Waveform

Package Mechanical Data(TO-252-4L)



SYMBOL	MILLIMETER		
	MIN	Typ.	MAX
A	2.200	2.300	2.400
A1	0.000		0.127
b	0.550	0.600	0.650
b1	0.000		0.120
c (电镀后)	0.460	0.520	0.580
D	6.500	6.600	6.700
D1	5.334 REF		
D2	5.346 REF		
D3	4.490 REF		
E	6.000	6.100	6.200
e	1.270 TYP		
e1	2.540 TYP		
h	0.000	0.100	0.200
L	9.900	10.100	10.300
L1	2.988 REF		
L2	1.400	1.550	1.700
L3	1.600 REF		
L4	0.700	0.800	0.900
φ	1.100	1.200	1.300
θ	0°		8°
θ 1	9° TYP		
θ 2	9° TYP		

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