

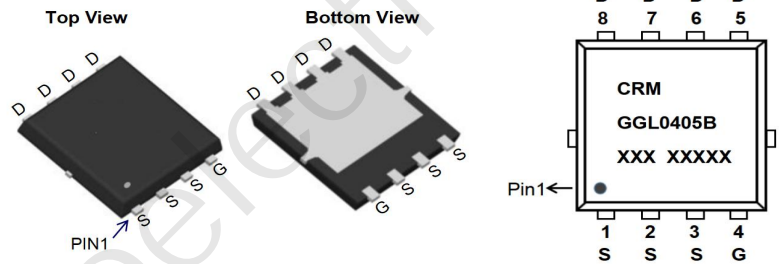
Description

Features

- 40V, 60A
- $R_{DS(ON)}$ Typ = 4.6mΩ @ $V_{GS} = 10V$
- $R_{DS(ON)}$ Typ = 6.4mΩ @ $V_{GS} = 4.5V$
- Advanced Split Gate Trench Technology
- Excellent $R_{DS(ON)}$ and Low Gate Charge
- 100% UIS TESTED!
- 100% ΔV_d s TESTED!



Schematic Diagram



Marking and Pin Assignment

Application

- Load Switch
- PWM Application
- Power Management

Package Marking and Ordering Information

Device	Marking	Package	Outline	Reel Size	Reel (pcs)	Per Carton (pcs)
CRMGGL0405B	CRMGGL0405B	PDFN5x6-8L	TAPING	13"	5000	50000

Absolute Maximum Ratings (@ $T_J = 25^\circ\text{C}$ unless otherwise specified)

Symbol	Parameter	Value	Units
V_{DS}	Drain-to-Source Voltage	40	V
V_{GS}	Gate-to-Source Voltage	±20	V
I_D	Continuous Drain Current	$T_C = 25^\circ\text{C}$	60
		$T_C = 100^\circ\text{C}$	36
I_{DM}	Pulsed Drain Current ⁽¹⁾	240	A
E_{AS}	Single Pulsed Avalanche Energy ⁽²⁾	56	mJ
P_D	Power Dissipation	$T_C = 25^\circ\text{C}$	37
$R_{\theta JC}$	Thermal Resistance, Junction to Case	3.3	$^\circ\text{C/W}$
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
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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	1.65	2.2	V
$R_{DS(ON)}$	Static Drain-Source ON-Resistance ⁽³⁾	$V_{GS} = 10\text{V}, I_D = 20\text{A}$	-	4.6	6.0	mΩ
		$V_{GS} = 4.5\text{V}, I_D = 15\text{A}$	-	6.4	8.3	mΩ

Dynamic Characteristics

C_{iss}	Input Capacitance	$V_{GS} = 0\text{V}, V_{DS} = 20\text{V},$ $f = 1\text{MHz}$	-	950	-	pF
C_{oss}	Output Capacitance		-	597	-	pF
C_{rss}	Reverse Transfer Capacitance		-	28	-	pF
Q_g	Total Gate Charge	$V_{GS} = 0 \text{ to } 10\text{V}$ $V_{DS} = 20\text{V}, I_D = 20\text{A}$	-	17	-	nC
Q_{gs}	Gate Source Charge		-	4.5	-	nC
Q_{gd}	Gate Drain("Miller") Charge		-	2	-	nC

Switching Characteristics

$t_{d(on)}$	Turn-On DelayTime	$V_{GS} = 10\text{V}, V_{DD} = 20\text{V}$ $I_D = 20\text{A}, R_{GEN} = 3\Omega$	-	6.5	-	ns
t_r	Turn-On Rise Time		-	2.7	-	ns
$t_{d(off)}$	Turn-Off DelayTime		-	26	-	ns
t_f	Turn-Off Fall Time		-	3.6	-	ns

Drain-Source Diode Characteristics and Max Ratings

I_S	Maximum Continuous Drain to Source Diode Forward Current	$V_{GS} = 0\text{V}, I_S = 20\text{A}$	-	-	60	A
I_{SM}	Maximum Pulsed Drain to Source Diode Forward Current		-	-	240	A
V_{SD}	Drain to Source Diode Forward Voltage		-	-	1.2	V
t_{rr}	Body Diode Reverse Recovery Time		-	40	-	ns
Q_{rr}	Body Diode Reverse Recovery Charge		-	22	-	nC

- Notes:
1. Repetitive Rating: Pulse Width Limited by Maximum Junction Temperature.
 2. E_{AS} condition: Starting $T_J = 25^\circ\text{C}$, $V_{DD} = 20\text{V}$, $V_G = 10\text{V}$, $R_G = 25\text{ohm}$, $L = 0.5\text{mH}$, $I_{AS} = 15\text{A}$
 3. Pulse Test: Pulse Width $\leq 300\mu\text{s}$, Duty Cycle $\leq 0.5\%$.

Typical Performance Characteristics

Figure 1: Output Characteristics

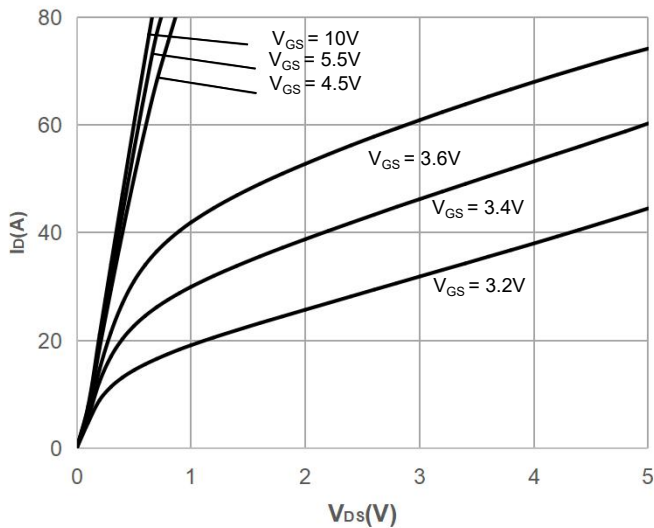


Figure 2: Typical Transfer Characteristics

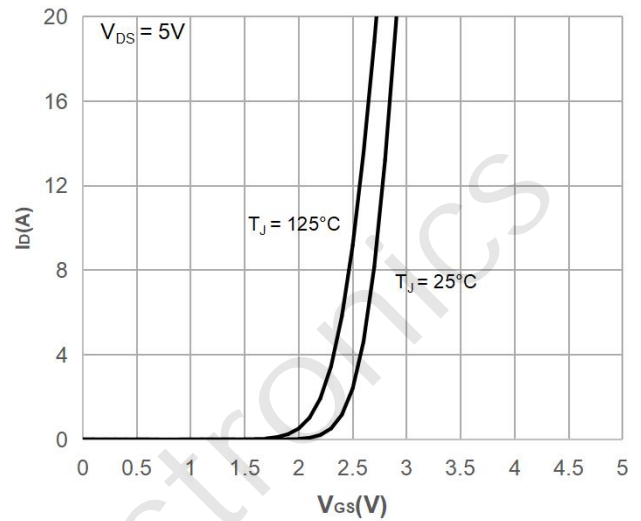


Figure 3: On-resistance vs. Drain Current

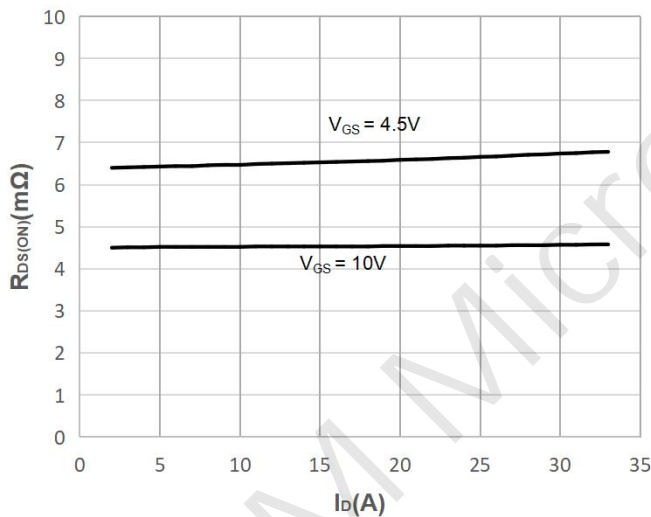


Figure 4: Body Diode Characteristics

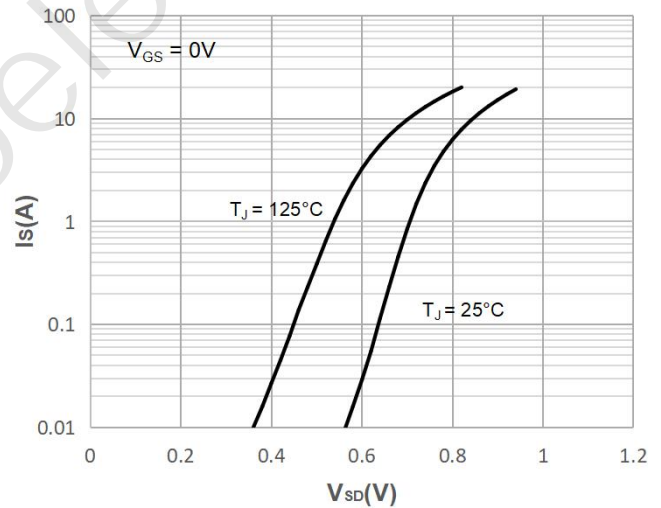


Figure 5: Gate Charge Characteristics

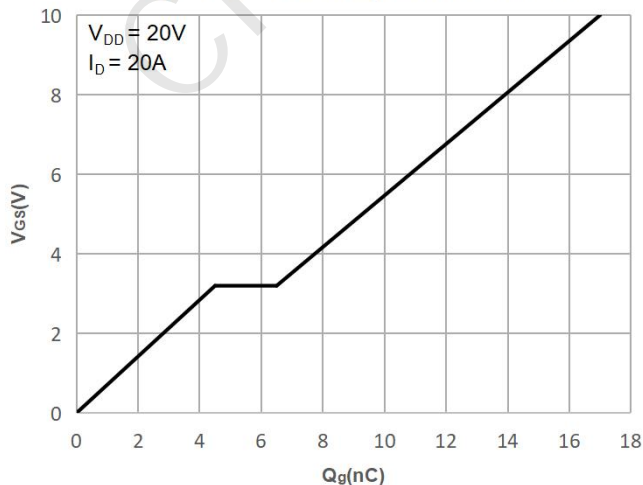
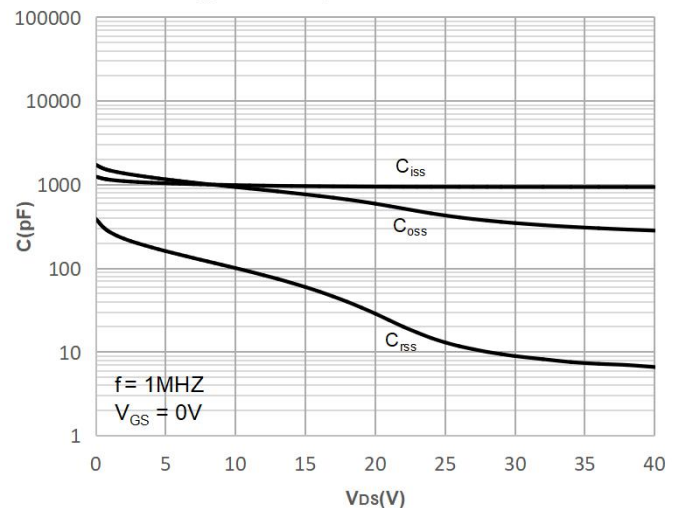


Figure 6: Capacitance Characteristics



Typical Performance Characteristics

Figure 7: Normalized Breakdown voltage vs. Junction Temperature

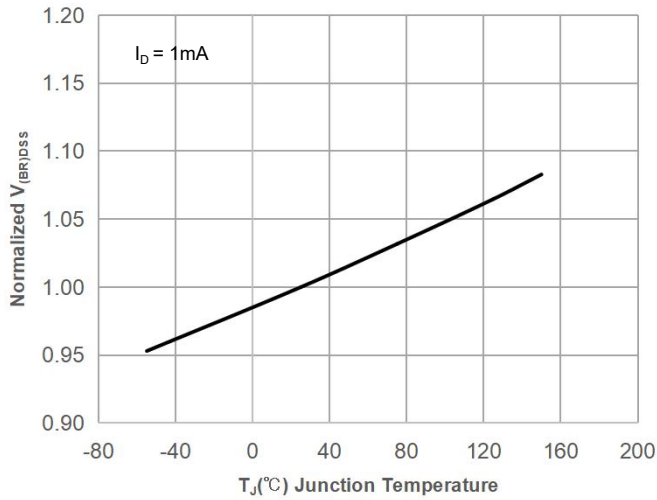


Figure 8: Normalized on Resistance vs. Junction Temperature

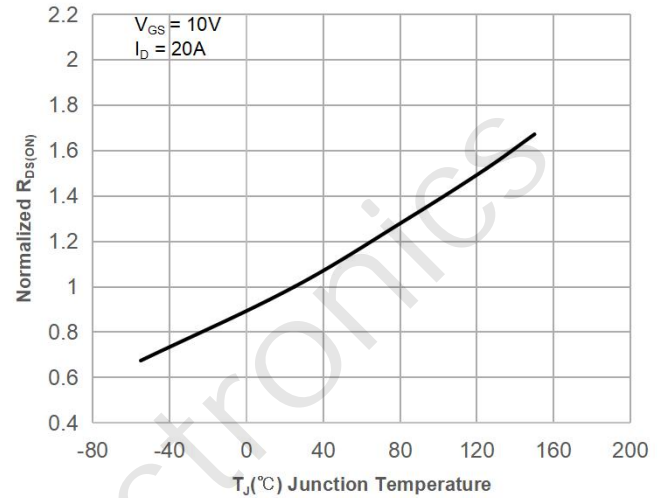


Figure 9: Maximum Safe Operating Area

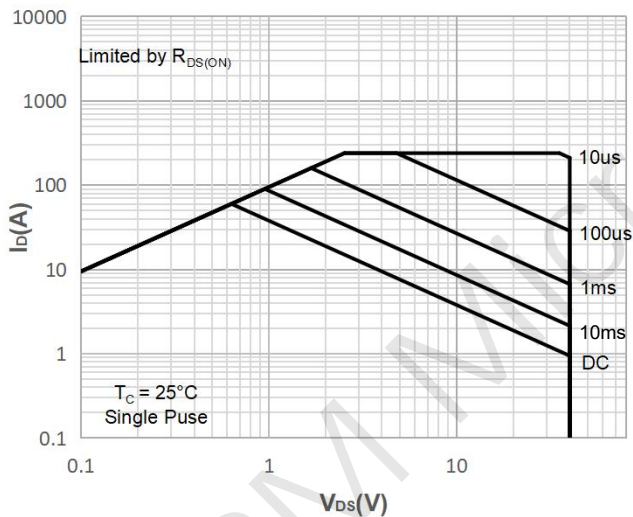


Figure 10: Maximum Continuous Drain Current vs. Case Temperature

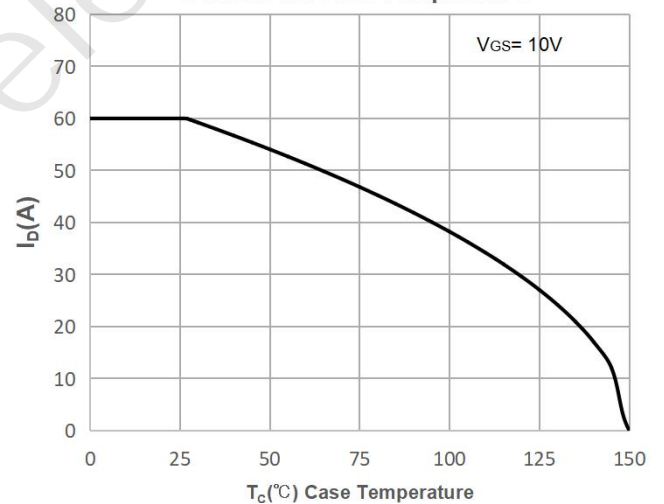


Figure 11: Normalized Maximum Transient Thermal Impedance

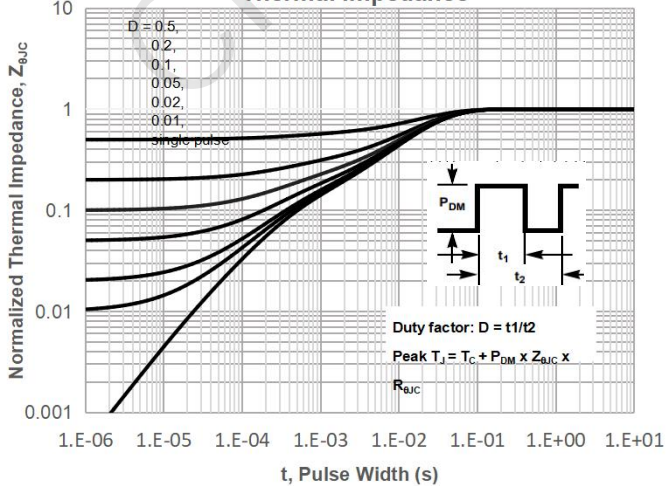
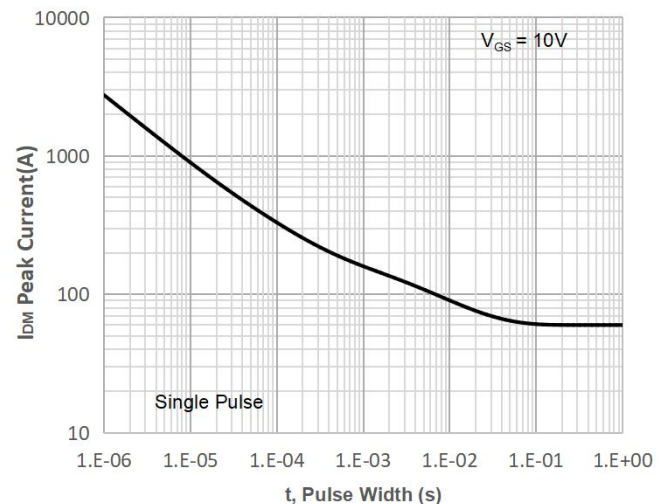


Figure 12: Peak Current Capacity



Test Circuit

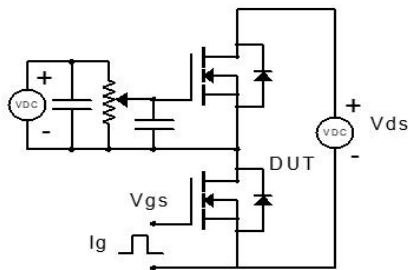


Figure 1: Gate Charge Test Circuit & Waveform



Figure 2: Resistive Switching Test Circuit & Waveform

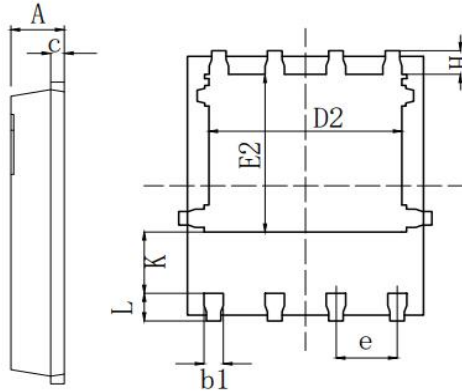
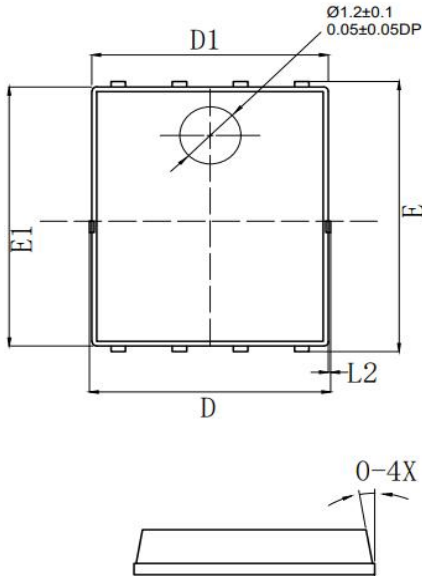


Figure 3: Unclamped Inductive Switching Test Circuit & Waveform



Figure 4: Diode Recovery Test Circuit & Waveform

Package Mechanical Data(PDFN5x6-8L)



SYMBOL	MILLIMETER		
	MIN	NOM	MAX
A	0.90	1.00	1.10
b	0.25	0.30	0.35
b1	0.30	0.40	0.45
c	0.22	0.25	0.28
D	—	—	5.30
D1	4.90	5.05	5.20
D2	3.90REF		
E	6.00	6.15	6.30
E1	5.70	5.85	6.00
E2	3.50REF		
e	1.10	1.27	1.40
H	0.51	0.61	0.71
K	1.10	—	—
L	0.51	0.61	0.71
L2	—	—	0.10
Φ	8°	—	12°

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