CRMPGH1560A

N-Channel 150V, 61.5mΩ Typ. Power MOSFET

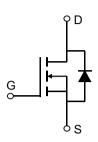
Description

Features

• 150V, 4.5A

 $R_{DS(ON)}$ Typ = 61.5m Ω @ V_{GS} = 10V

- Advanced Split Gate Trench Technology
- Excellent R_{DS(ON)} and Low Gate Charge
- Lead Free
- 100% UIS TESTED!

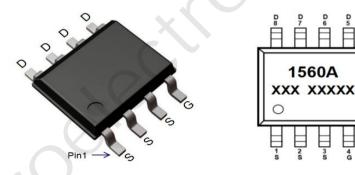




ochematic biagram

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)
CRMPGH1560A	1560A	SOP-8	TAPING	13"	4000	40000

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

Symbol	Parameter		Value	Units
V_{DS}	Drain-to-Source Voltage		150	V
V_{GS}	Gate-to-Source Voltage		±20	V
	Continuous Drain Current	T _A = 25°C	4.5	Α
I _D		T _A = 100°C	2.7	А
I _{DM}	Pulsed Drain Current (1)		18	А
E _{AS}	Single Pulsed Avalanche Energy (2)		20	mJ
P_{D}	Power Dissipation	T _A = 25°C	3.1	W
$R_{\scriptscriptstyle{ hetaJA}}$	Thermal Resistance, Junction to Ambient ⁽³⁾		40	°C/W
T_J,T_STG	Junction & Storage Temperature Range		-55 to 150	°C

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

	<u> </u>				
Parameter	Conditions	Min.	Тур.	Max.	Unit
acteristics					
Drain-Source Breakdown Voltage	$I_D = 250 \mu A, V_{GS} = 0 V$	150	-	-	V
Zero Gate Voltage Drain Current	V _{DS} = 150V, V _{GS} = 0V	-	-	1.0	μΑ
Gate-Body Leakage Current	$V_{DS} = 0V, V_{GS} = \pm 20V$	-	-	±100	nA
acteristics				6)
Gate Threshold Voltage	$V_{DS} = V_{GS}, I_{D} = 250 \mu A$	2.4	3	3.6	V
Static Drain-Source ON-Resistance ⁽⁴⁾	V_{GS} = 10V, I_D = 3A	-	61.5	80	mΩ
Characteristics					
Input Capacitance		- /	368	-	pF
Output Capacitance		-(50	-	pF
Reverse Transfer Capacitance	1 – 11VII 12	Χ-\	4	-	pF
Total Gate Charge		-	5.5	-	nC
Gate Source Charge		U -	1.2	-	nC
Gate Drain("Miller") Charge	V _{DS} = 73V, I _D = 2A	-	2	-	nC
g Characteristics					
Turn-On DelayTime		-	4.6	-	ns
Turn-On Rise Time	$V_{GS} = 10V, V_{DD} = 75V$	-	3.3	-	ns
Turn-Off DelayTime	I_D = 2A, R_{GEN} = 6Ω	-	7.5	-	ns
Turn-Off Fall Time		-	3.6	-	ns
urce Diode Characteristics and M	Max Ratings				
Maximum Continuous Drain to Source Diode Forward Current		-	-	4.5	Α
Maximum Pulsed Drain to Source Diode Forward Current		-	-	18	Α
Drain to Source Diode Forward Voltage	$V_{GS} = 0V, I_{S} = 3A$	-	-	1.2	V
			70		ns
Body Diode Reverse Recovery Time	$I_F = 4A$, di/dt = 100A/us	-	70	-	113
9	Cteristics Drain-Source Breakdown Voltage Zero Gate Voltage Drain Current Gate-Body Leakage Current Cteristics Gate Threshold Voltage Static Drain-Source ON-Resistance ⁽⁴⁾ Characteristics Input Capacitance Output Capacitance Reverse Transfer Capacitance Total Gate Charge Gate Source Charge Gate Drain("Miller") Charge g Characteristics Turn-On DelayTime Turn-On Rise Time Turn-Off DelayTime Turn-Off Fall Time Irce Diode Characteristics and Maximum Continuous Drain to Source Diode Maximum Pulsed Drain to Source Diode	Cteristics Drain-Source Breakdown Voltage $I_D = 250\mu A$, $V_{GS} = 0V$ Zero Gate Voltage Drain Current $V_{DS} = 150V$, $V_{GS} = 0V$ Gate-Body Leakage Current $V_{DS} = 0V$, $V_{GS} = \pm 20V$ Cteristics Gate Threshold Voltage $V_{DS} = V_{GS}$, $I_D = 250\mu A$ Static Drain-Source ON-Resistance $^{(4)}$ $V_{GS} = 10V$, $I_D = 3A$ Characteristics Input Capacitance Output Capacitance $V_{GS} = 0V$, $V_{DS} = 75V$, $I_D = 100$ Reverse Transfer Capacitance $V_{GS} = 0 \text{ to } 10V$ Total Gate Charge $V_{GS} = 0 \text{ to } 10V$ Gate Source Charge $V_{GS} = 0 \text{ to } 10V$ Gate Drain("Miller") Charge $V_{GS} = 10V$, $V_{DD} = 75V$ Gate Drain("Miller") Charge $V_{GS} = 10V$, $V_{DD} = 75V$ Turn-On DelayTime $V_{GS} = 10V$, $V_{DD} = 75V$ Turn-Off DelayTime $V_{DS} = 2A$, $V_{DS} = 6\Omega$ Turn-Off Fall Time $V_{DS} = 10V$, $V_{DS} = 10V$ Auximum Continuous Drain to Source Diode Forward Current Maximum Pulsed Drain to Source Diode Forward Current	cteristics Drain-Source Breakdown Voltage $I_D = 250\mu A$, $V_{GS} = 0V$ 150 Zero Gate Voltage Drain Current $V_{DS} = 150V$, $V_{GS} = 0V$ - Gate-Body Leakage Current $V_{DS} = 0V$, $V_{GS} = \pm 20V$ - cteristics - - Gate Threshold Voltage $V_{DS} = V_{GS}$, $I_D = 250\mu A$ 2.4 Static Drain-Source ON-Resistance ⁽⁴⁾ $V_{GS} = 10V$, $I_D = 3A$ - Characteristics - - Input Capacitance - - Output Capacitance - - Reverse Transfer Capacitance - - Total Gate Charge V _{GS} = 0 to 10V - Gate Source Charge V _{OS} = 75V, $I_D = 2A$ - Gate Drain("Miller") Charge - - Gate Drain("Miller") Charge - - J Characteristics - - Turn-On Rise Time V _{OS} = 10V, V _{DD} = 75V - Turn-Off DelayTime - - Turn-Off Fall Time - - Turn-Off Fall Time - - Turn-Off DelayTime Time - -	Cteristics Journel Source Breakdown Voltage $I_D = 250\mu A$, $V_{GS} = 0V$ 150 - Zero Gate Voltage Drain Current $V_{DS} = 150V$, $V_{GS} = 0V$ - - Gate-Body Leakage Current $V_{DS} = 0V$, $V_{GS} = \pm 20V$ - - Cteristics Static Drain-Source ON-Resistance VDS = V_{GS} , $I_D = 250\mu A$ 2.4 3 Static Drain-Source ON-Resistance ON-Resistance VDS = $V_{GS} = 10V$, $V_D = 3A$ - 61.5 Characteristics - 368 Input Capacitance - 368 Output Capacitance - 368 Reverse Transfer Capacitance - 4 Total Gate Charge - 5.5 Gate Source Charge V _{GS} = 0 to 10V - 1.2 Gate Drain("Miller") Charge - 2 2 g Characteristics - 2 2 Turn-On DelayTime - 4.6 - Turn-Off DelayTime ID = 2A, RGEN = 6Ω - 7.5 Turn-Off Fall Time - 3.6 Introductor Source Diode Forward Current - - Introductor Source Diode For	CeteristicsDrain-Source Breakdown Voltage $I_D = 250\mu A$, $V_{GS} = 0V$ 150 Zero Gate Voltage Drain Current $V_{DS} = 150V$, $V_{GS} = 0V$ 1.0Gate-Body Leakage Current $V_{DS} = 0V$, $V_{GS} = \pm 20V$ ± 100 CetristicsGate Threshold Voltage $V_{DS} = V_{GS}$, $I_D = 250\mu A$ 2.433.6Static Drain-Source ON-Resistance $^{(4)}$ $V_{GS} = 10V$, $I_D = 3A$ -61.580CharacteristicsInput Capacitance-368-Output Capacitance-368-Total Gate Charge-5.5-Gate Source Charge-5.5-Gate Drain("Miller") Charge-5.5-Gate Drain("Miller") Charge-2-CharacteristicsTurn-On DelayTime-4.6-Turn-On Rise Time $V_{GS} = 10V$, $V_{DD} = 75V$ -3.3-Turn-Off DelayTime-4.6-Turn-Off Fall Time-3.6-Ince Diode Characteristics and Max RatingsMaximum Continuous Drain to Source Diode Forward Current-4.5Maximum Pulsed Drain to Source Diode Forward Current4.5

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}=9A

^{3.} $R_{\theta JA}$ is measured with the device mounted on a 1inch² pad of 2oz copper FR4 PCB

^{4.} Pulse Test: Pulse Width≤300µs, Duty Cycle≤0.5%.



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Typical Performance Characteristics

Figure 1: Output Characteristics

V_{GS} = 10V

V_{GS} = 7V

V_{GS} = 5.4V

V_{GS} = 5.2V

V_{GS} = 5.0V

2

3

Vos(V)

4

Figure 2: Typical Transfer Characteristics

16

V_{DS} = 5V

12

T_J = 125°C

T_J = 25°C

0

0

1

V_S = 5V

T_J = 125°C

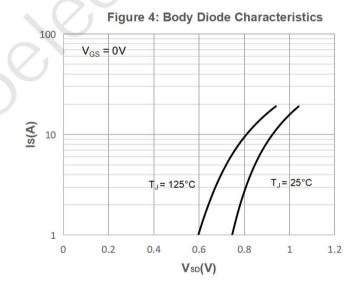
V_S = 5V

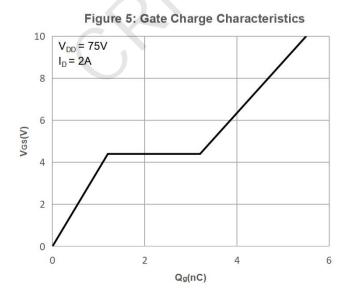
V_S = 5V

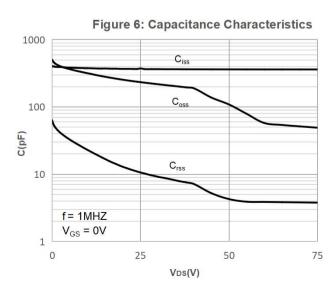
T_J = 25°C

Figure 3: On-resistance vs. Drain Current

120
100
80
V_{GS} = 10V
20
0
5
10
15
20
Ib(A)







Typical Performance Characteristics

Figure 7: Normalized Breakdown voltage vs.
Junction Temperature

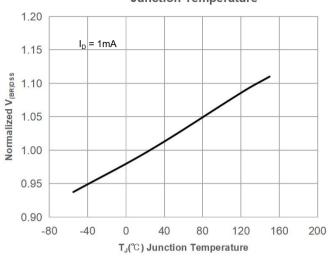


Figure 9: Maximum Safe Operating Area

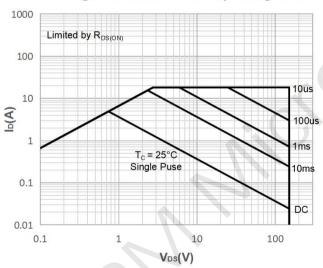


Figure 11: Normalized Maximum Transient

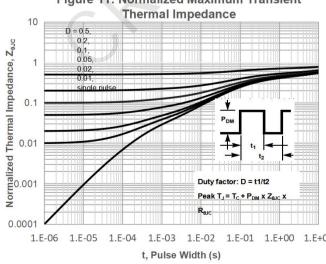


Figure 8: Normalized on Resistance vs. Junction Temperature

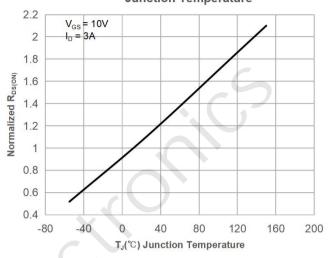


Figure 10: Maximum Continuous Drian
Current vs. Case Temperature

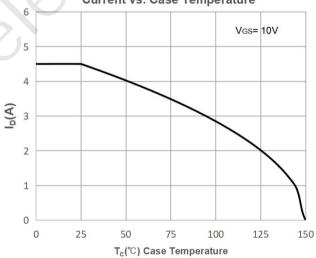
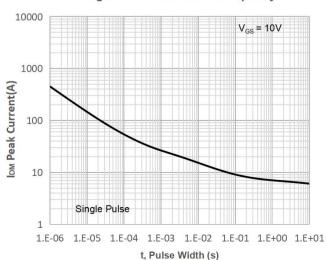


Figure 12: Peak Current Capacity



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Test Circuit

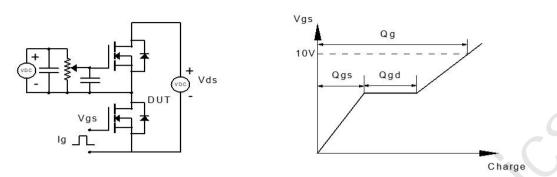


Figure 1: Gate Charge Test Circuit & Waveform

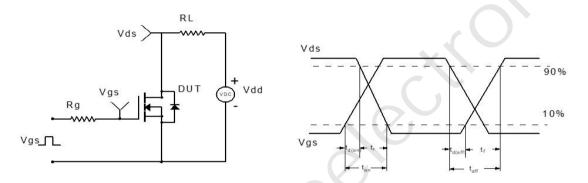


Figure 2: Resistive Switching Test Circuit & Waveform

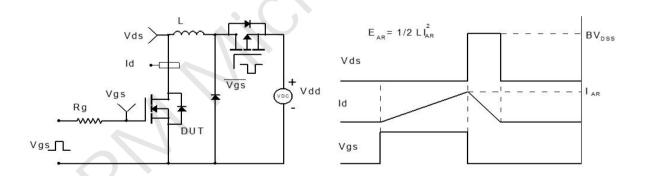


Figure 3: Unclamped Inductive Switching Test Circuit& Waveform

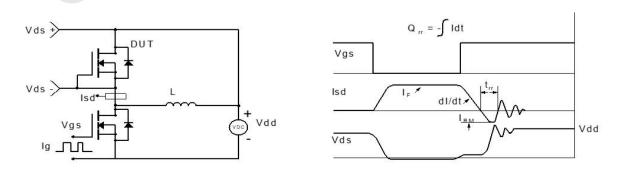
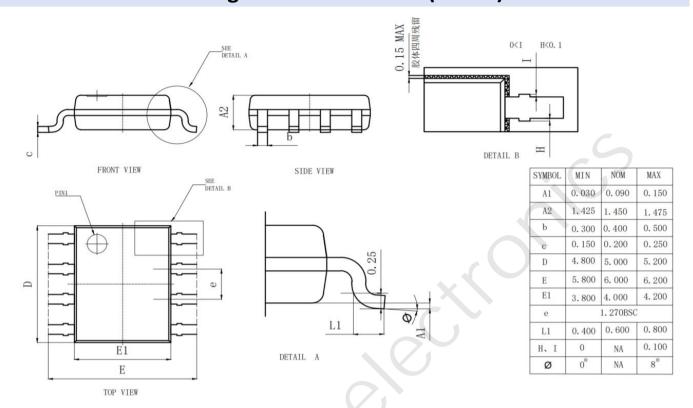


Figure 4: Diode Recovery Test Circuit & Waveform

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Package Mechanical Data(SOP-8)



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