

**• General Description**

The AGM614D combines advanced trench MOSFET technology with a low resistance package to provide extremely low  $R_{DS(ON)}$ . This device is ideal for load switch and battery protection applications.

**• Features**

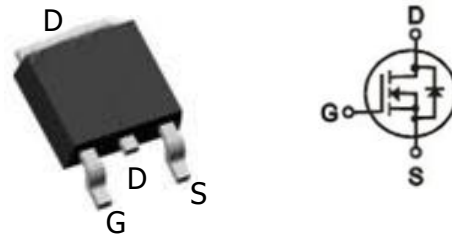
- Advance high cell density Trench technology
- Low  $R_{DS(ON)}$  to minimize conductive loss
- Low Gate Charge for fast switching
- Low Thermal resistance

**• Application**

- MB/VGA Vcore
- SMPS 2<sup>nd</sup> Synchronous Rectifier
- POL application
- BLDC Motor driver

**Product Summary**

BVDSS	RDSON	ID
60V	10mΩ	53A

**TO-252 Pin Configuration**

**Package Marking and Ordering Information**

Device Marking	Device	Device Package	Reel Size	Tape width	Quantity
AGM614D	AGM614D	TO-252	325mm	16mm	2500

**Table 1. Absolute Maximum Ratings (T<sub>A</sub>=25°C)**

Symbol	Parameter	Value	Unit
V <sub>DS</sub>	Drain-Source Voltage (V <sub>GS</sub> =0V)	60	V
V <sub>GS</sub>	Gate-Source Voltage (V <sub>DS</sub> =0V)	±20	V
I <sub>D</sub>	Drain Current-Continuous(T <sub>c</sub> =25°C) (Note 1)	53	A
	Drain Current-Continuous(T <sub>c</sub> =100°C)	36	A
IDM (pluse)	Drain Current-Continuous@ Current-Pulsed (Note 2)	120	A
P <sub>D</sub>	Maximum Power Dissipation(T <sub>c</sub> =25°C)	60	W
	Maximum Power Dissipation(T <sub>c</sub> =100°C)	34	W
EAS	Avalanche energy (Note 3)	45	mJ
T <sub>J</sub> , T <sub>STG</sub>	Operating Junction and Storage Temperature Range	-55 To 150	°C

**Table 2. Thermal Characteristic**

Symbol	Parameter	Typ	Max	Unit
R <sub>θJA</sub>	Thermal Resistance Junction-ambient (Steady State) <sup>1</sup>	---	60	°C/W
R <sub>θJC</sub>	Thermal Resistance Junction-Case <sup>1</sup>	---	2.5	°C/W

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

Symbol	Parameter	Test Condition	Min.	Typ.	Max.	Units
<b>Off Characteristic</b>						
$V_{(BR)DSS}$	Drain-Source Breakdown Voltage	$V_{GS}=0V, I_D=250\mu A$	60	-	-	V
$I_{DSS}$	Zero Gate Voltage Drain Current	$V_{DS}=48V, V_{GS}=0V,$	-	-	1.0	$\mu A$
$I_{GSS}$	Gate to Body Leakage Current	$V_{DS}=0V, V_{GS}=\pm 20V$	-	-	$\pm 100$	nA
<b>On Characteristics</b>						
$V_{GS(th)}$	Gate Threshold Voltage	$V_{DS}=V_{GS}, I_D=250\mu A$	1.4	1.7	2.5	V
$R_{DS(on)}$	Static Drain-Source on-Resistance <small>note2</small>	$V_{GS}=10V, I_D=30A$	-	10	14	m $\Omega$
		$V_{GS}=4.5V, I_D=20A$	-	14	19	
$g_{FS}$	Forward Transconductance	$V_{DS}=5V, I_D=20A$	-	65	-	S
<b>Dynamic Characteristics</b>						
$C_{iss}$	Input Capacitance	$V_{DS}=30V, V_{GS}=0V,$ $f=1.0\text{MHz}$	-	1700	-	pF
$C_{oss}$	Output Capacitance		-	152	-	pF
$C_{riss}$	Reverse Transfer Capacitance		-	109	-	pF
$Q_g$	Total Gate Charge	$V_{DS}=30V, I_D=30A,$ $V_{GS}=10V$	-	45.2	-	nC
$Q_{gs}$	Gate-Source Charge		-	6	-	nC
$Q_{gd}$	Gate-Drain("Miller") Charge		-	14.1	-	nC
<b>Switching Characteristics</b>						
$t_{d(on)}$	Turn-on Delay Time	$V_{DS}=30V,$ $R_L=1.5\Omega, R_{GEN}=3\Omega,$ $V_{GS}=10V$	-	7.1	-	ns
$t_r$	Turn-on Rise Time		-	5.1	-	ns
$t_{d(off)}$	Turn-off Delay Time		-	26.3	-	ns
$t_f$	Turn-off Fall Time		-	5.5	-	ns
<b>Drain-Source Diode Characteristics and Maximum Ratings</b>						
$I_S$	Maximum Continuous Drain to Source Diode Forward Current		-	-	53	A
$I_{SM}$	Maximum Pulsed Drain to Source Diode Forward Current		-	-	120	A
$V_{SD}$	Drain to Source Diode Forward Voltage	$V_{GS}=0V, I_S=50A$	-	-	1.2	V
$t_{rr}$	Body Diode Reverse Recovery Time	$I_F=30A, di/dt=100A/\mu s$	-	29	-	ns
$Q_{rr}$	Body Diode Reverse Recovery Charge		-	40	-	nC

Notes: 1. Repetitive Rating: Pulse Width Limited by Maximum Junction Temperature

 2. Pulse Test: Pulse Width $\leq 300\mu s$ , Duty Cycle $\leq 0.5\%$

### Typical Performance Characteristics

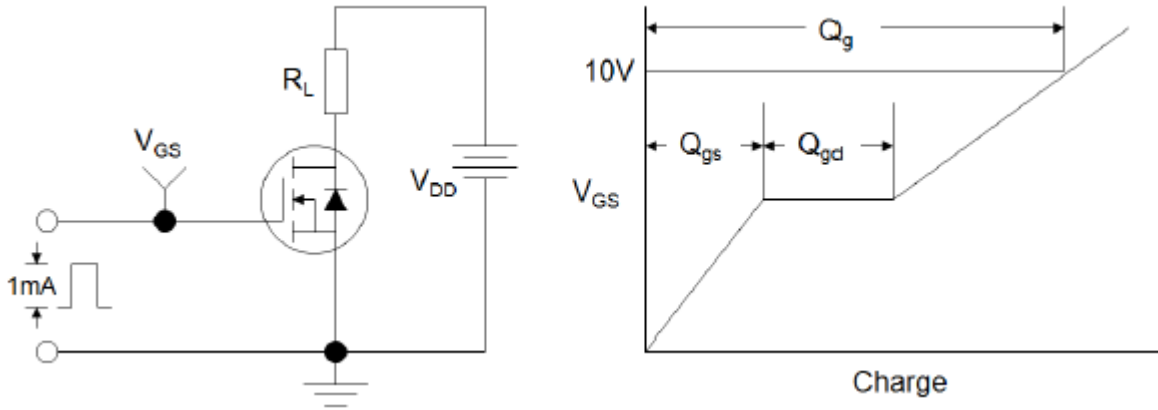


Figure1:Gate Charge Test Circuit & Waveform

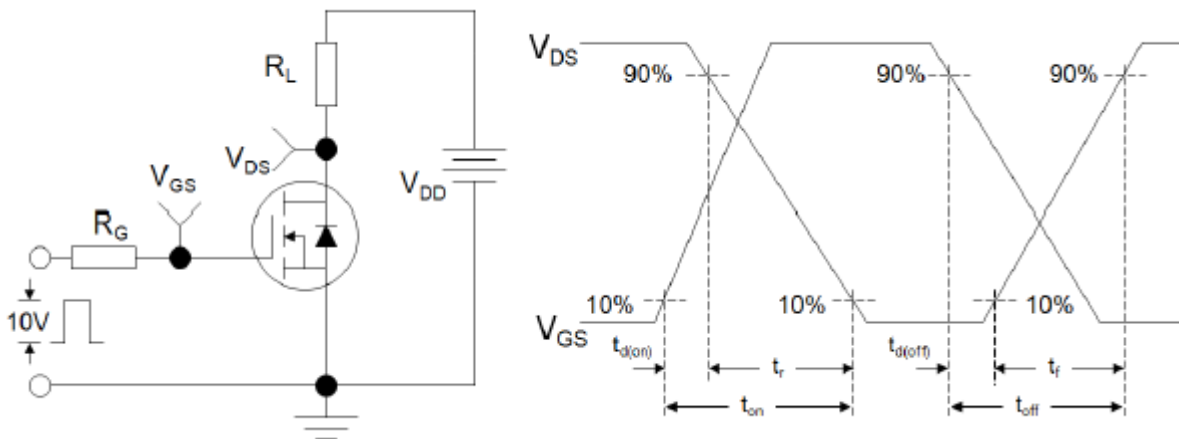


Figure 2: Resistive Switching Test Circuit & Waveforms

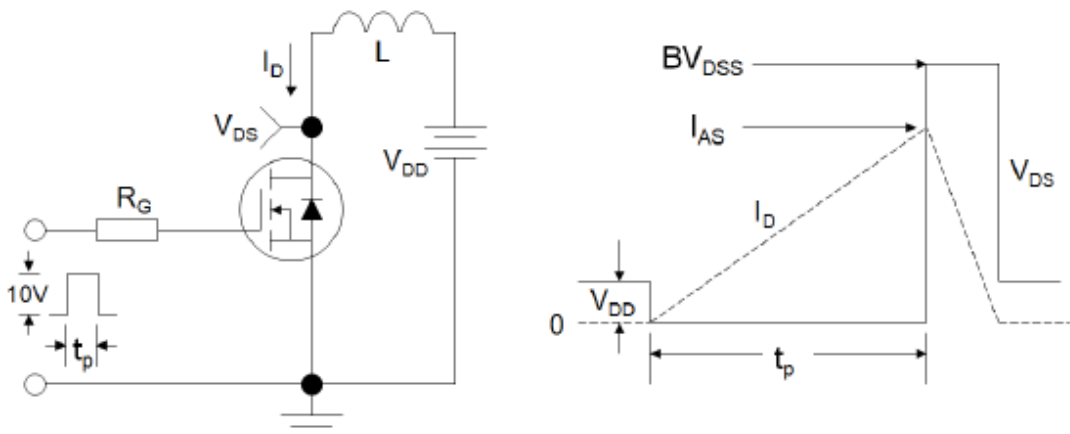
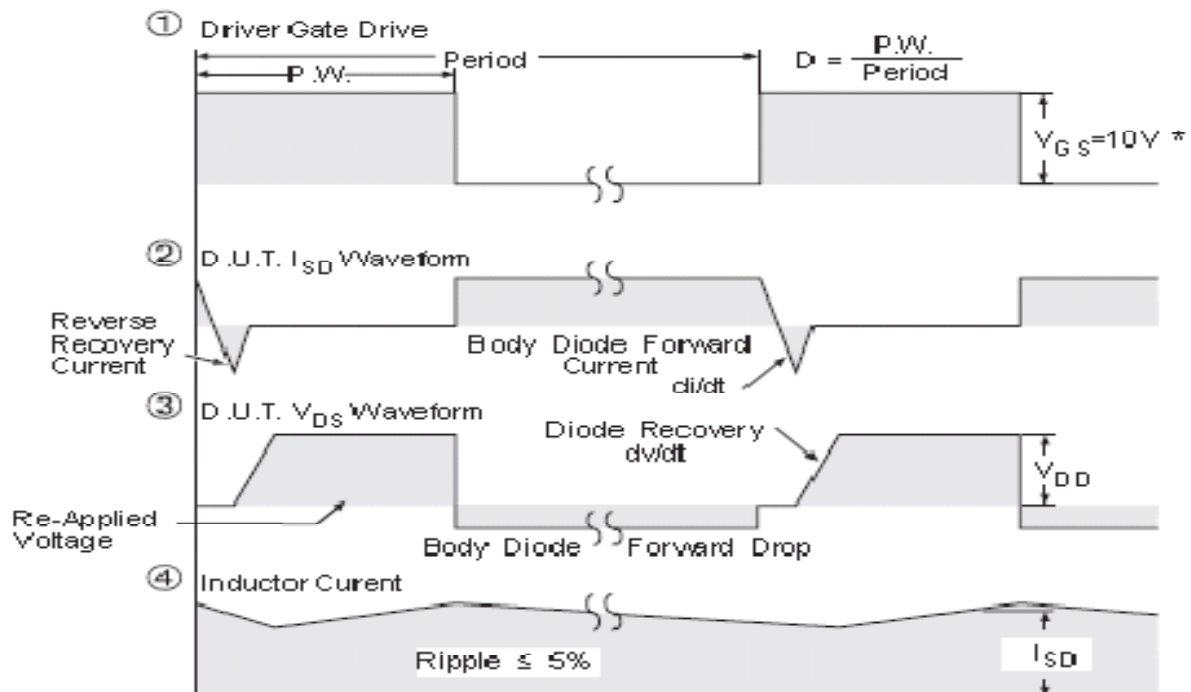
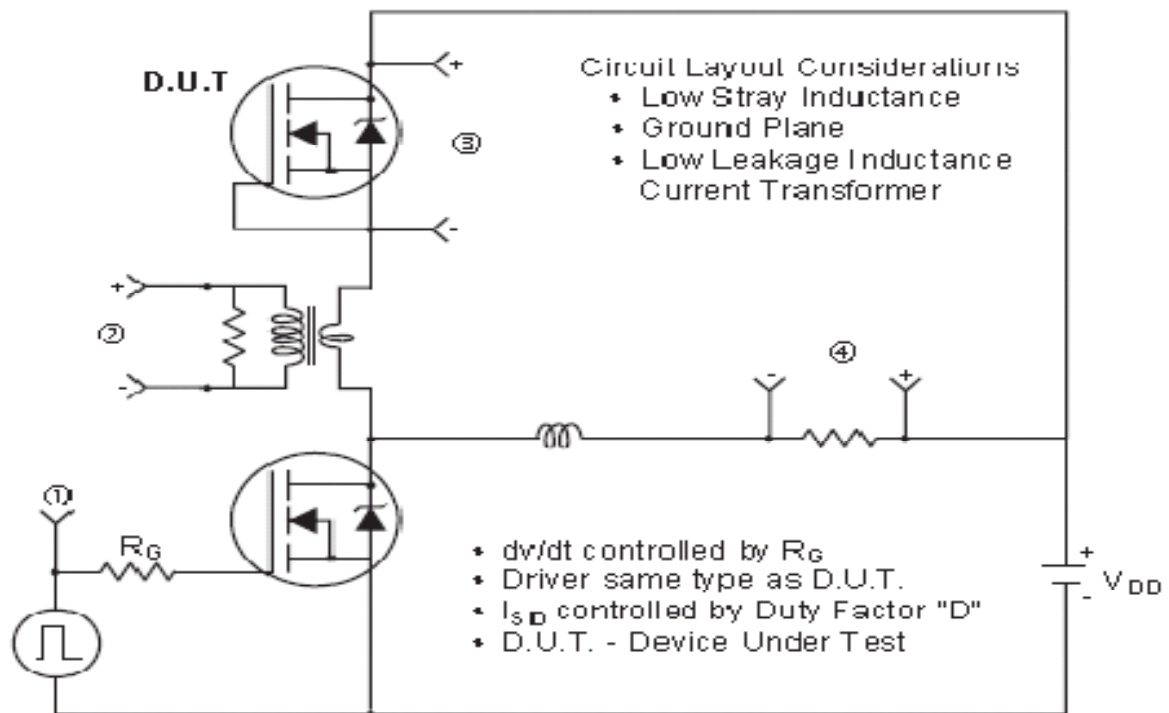


Figure 3:Unclamped Inductive Switching Test Circuit & Waveforms

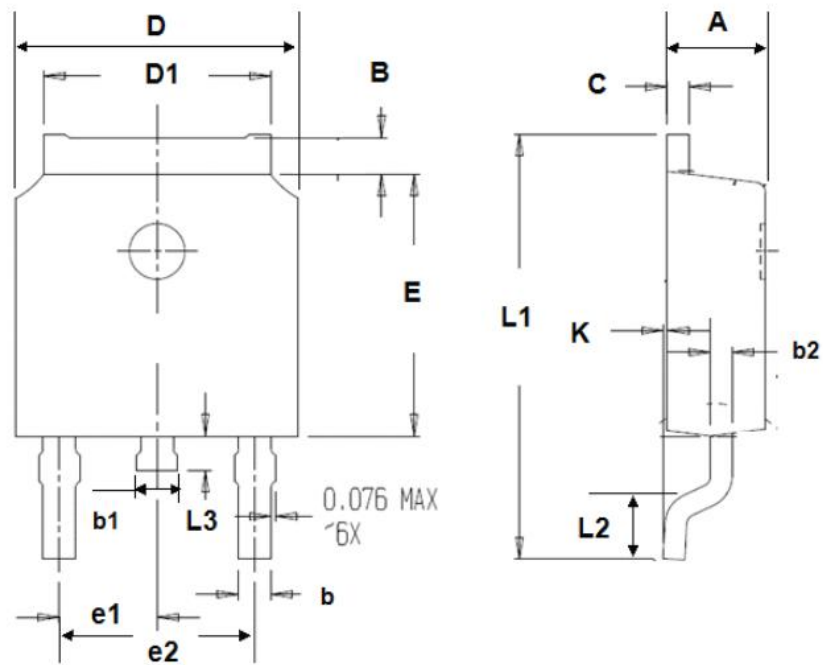


\*  $V_{GS} = 5V$  for Logic Level Devices

**Figure 4: Peak Diode Recovery  $dv/dt$  Test Circuit & Waveforms (For N-channel)**

**•Dimensions**

SYMBOL	min	max	SYMBOL	min	max
A	2.10	2.50	B	0.85	1.25
b	0.50	0.80	b1	0.50	0.90
b2	0.45	0.70	C	0.45	0.70
D	6.30	6.75	D1	5.10	5.50
E	5.30	6.30	e1	2.25	2.35
L1	9.20	10.60	e2	4.45	4.75
L2	0.90	1.75	L3	0.60	1.10
K	0.00	0.23			




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