

- ★ 100% EAS Guaranteed
- ★ Green Device Available
- ★ Super Low Gate Charge
- ★ Excellent CdV/dt effect decline
- ★ Advanced high cell density Trench technology

**Product Summary**

BVDSS	RDSON	ID
100V	4.7mΩ	100A

**PRPAK5X6 Pin Configuration**

**Description**

AGM056N10A is the high cell density trenched N-ch MOSFETs, which provide excellent RDSON and gate charge for most of the synchronous buck converter applications.

**Package Marking and Ordering Information**

Device Marking	Device	Device Package	Reel Size	Tape width	Quantity
AGM056N10A	AGM056N10A	DFN5*6	325mm	16mm	3000

**Table 1. Absolute Maximum Ratings (TA=25°C)**

Symbol	Parameter	Value	Unit
V <sub>DS</sub>	Drain-Source Voltage (V <sub>GS</sub> =0V)	100	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)	100	A
	Drain Current-Continuous(T <sub>c</sub> =100°C)	75	A
IDM (pluse)	Drain Current-Continuous@ Current-Pulsed (Note 2)	300	A
P <sub>D</sub>	Maximum Power Dissipation(T <sub>c</sub> =25°C)	123	W
	Maximum Power Dissipation(T <sub>c</sub> =100°C)	63	W
EAS	Avalanche energy (Note 3)	120	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>	---	55	°C/W
R <sub>θJC</sub>	Thermal Resistance Junction-Case <sup>1</sup>	---	1.1	°C/W

**Table 3. Electrical Characteristics (TA=25°C unless otherwise noted)**

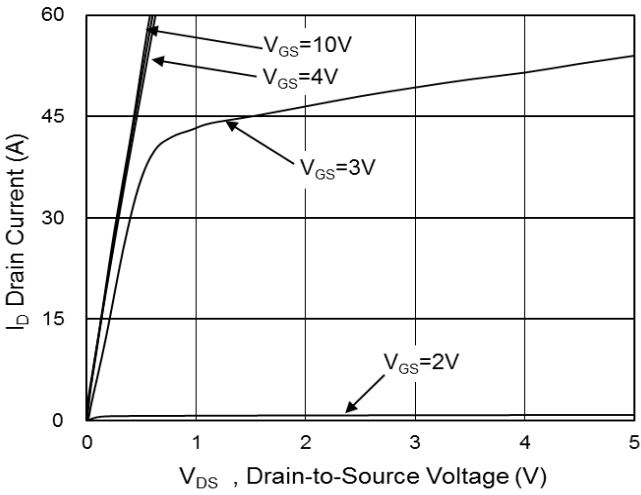
Symbol	Parameter	Conditions	Min	Typ	Max	Unit
<b>On/Off States</b>						
BV <sub>DSS</sub>	Drain-Source Breakdown Voltage	V <sub>GS</sub> =0V, I <sub>D</sub> =250μA	100			V
I <sub>DSS</sub>	Zero Gate Voltage Drain Current	V <sub>DS</sub> =80V, V <sub>GS</sub> =0V			1	μA
I <sub>GSS</sub>	Gate-Body Leakage Current	V <sub>GS</sub> =±20V, V <sub>DS</sub> =0V			±100	nA
V <sub>GS(th)</sub>	Gate Threshold Voltage	V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> =250μA	1.2	1.6	2.5	v
g <sub>FS</sub>	Forward Transconductance	V <sub>DS</sub> =5V, I <sub>D</sub> =20A		85		S
R <sub>DS(ON)</sub>	Drain-Source On-State Resistance	V <sub>GS</sub> =10V, I <sub>D</sub> =20A		4.7	6.5	mΩ
		V <sub>GS</sub> =4.5V, I <sub>D</sub> =15A		6.5	8.5	mΩ
<b>Dynamic Characteristics</b>						
C <sub>iss</sub>	Input Capacitance	V <sub>DS</sub> =50V, V <sub>GS</sub> =0V, F=1MHZ		3100		pF
C <sub>oss</sub>	Output Capacitance			605		pF
C <sub>rss</sub>	Reverse Transfer Capacitance			20		pF
R <sub>g</sub>	Gate resistance	V <sub>GS</sub> =0V, V <sub>DS</sub> =0V, f=1.0MHz		1.7		Ω
<b>Switching Times</b>						
t <sub>d(on)</sub>	Turn-on Delay Time	V <sub>GS</sub> =10V, V <sub>DS</sub> =50V, I <sub>D</sub> =14A, R <sub>GEN</sub> =3.3Ω		10		nS
t <sub>r</sub>	Turn-on Rise Time			6.5		nS
t <sub>d(off)</sub>	Turn-Off Delay Time			45		nS
t <sub>f</sub>	Turn-Off Fall Time			7.5		nS
Q <sub>g</sub>	Total Gate Charge	V <sub>GS</sub> =10V, V <sub>DS</sub> =50V, I <sub>D</sub> =12A		43		nC
Q <sub>gs</sub>	Gate-Source Charge			18		nC
Q <sub>gd</sub>	Gate-Drain Charge			9.5		nC
<b>Source-Drain Diode Characteristics</b>						
I <sub>S</sub>	Continuous Source Current	V <sub>G</sub> =V <sub>D</sub> =0V, Force Current			80	A
V <sub>SD</sub>	Forward on Voltage	V <sub>GS</sub> =0V, I <sub>S</sub> =20A			1.0	V
t <sub>rr</sub>	Reverse Recovery Time	I <sub>F</sub> =15A, dI/dt=100A/μs, ·T <sub>J</sub> =25°C			30	ns
Q <sub>rr</sub>	Reverse Recovery Charge					148

Notes 1.The maximum current rating is package limited.

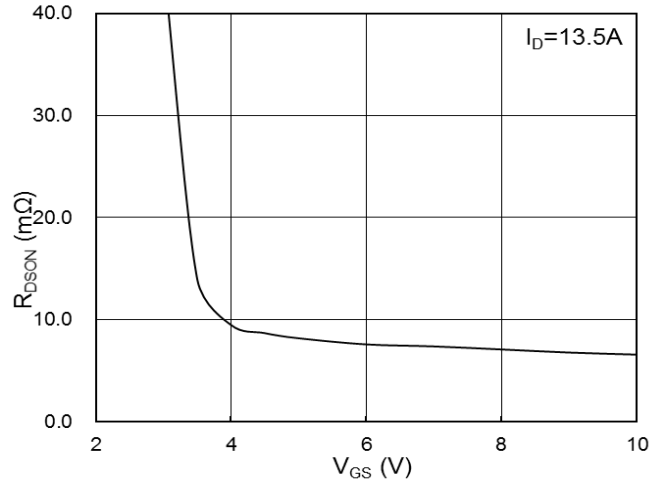
Notes 2.Repetitive Rating: Pulse width limited by maximum junction temperature

Notes 3.EAS condition: T<sub>J</sub>=25°C, V<sub>DD</sub>=50V, V<sub>G</sub>=10V, R<sub>G</sub>=3.3Ω

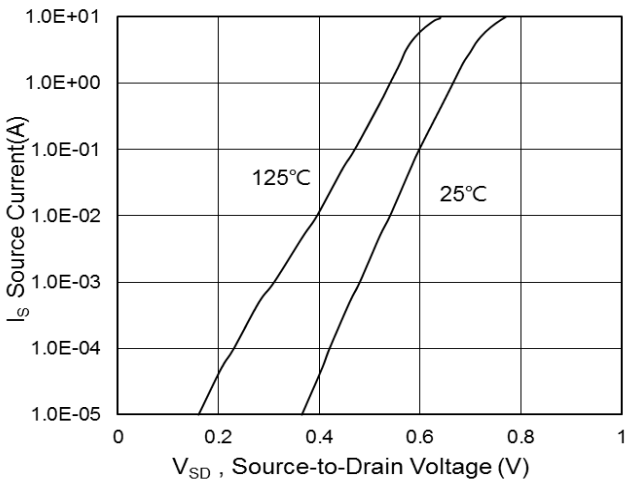
**Typical Characteristics**



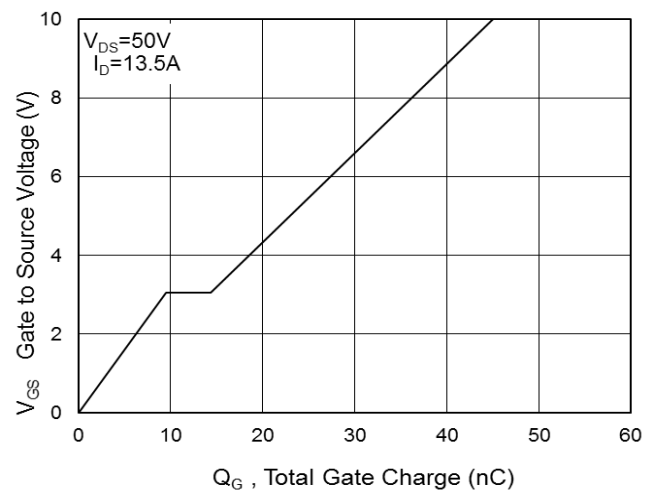
**Fig.1 Typical Output Characteristics**



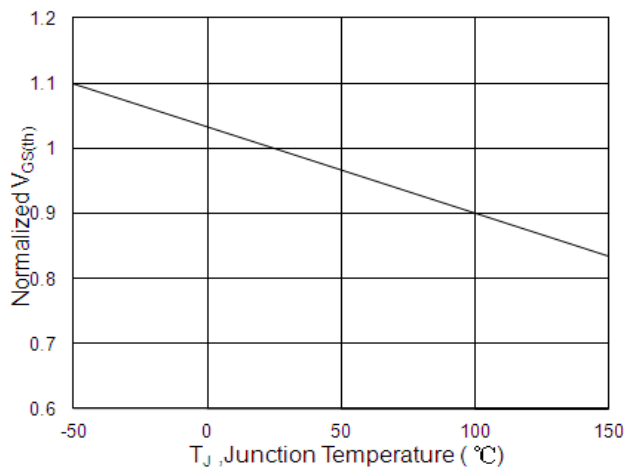
**Fig.2 On-Resistance vs. G-S Voltage**



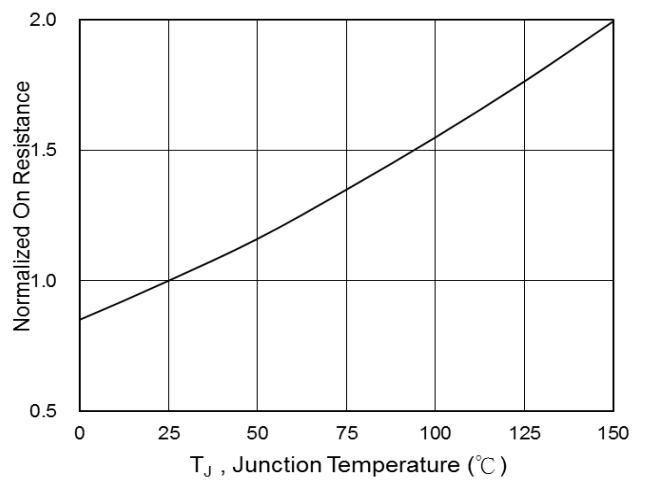
**Fig.3 Source-Drain Forward Characteristics**



**Fig.4 Gate-Charge Characteristics**



**Fig.5 Normalized  $V_{GS(th)}$  vs.  $T_J$**



**Fig.6 Normalized  $R_{DSON}$  vs.  $T_J$**

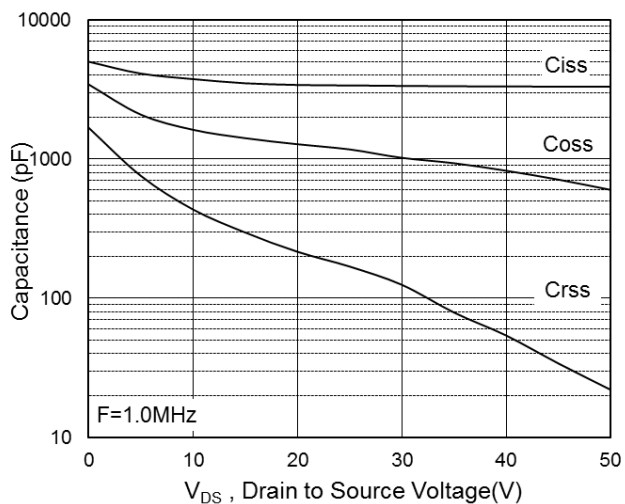


Fig.7 Capacitance

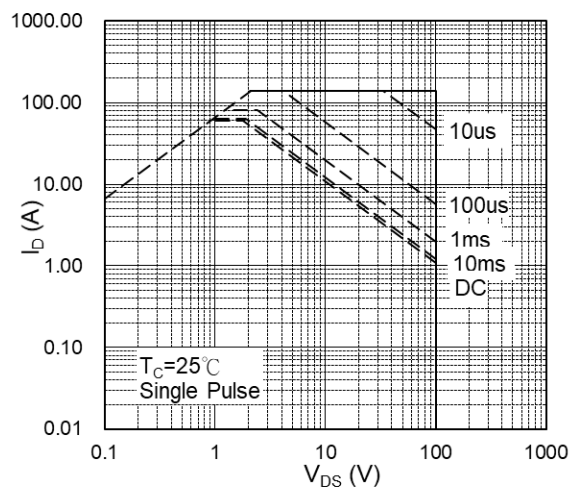


Fig.8 Safe Operating Area

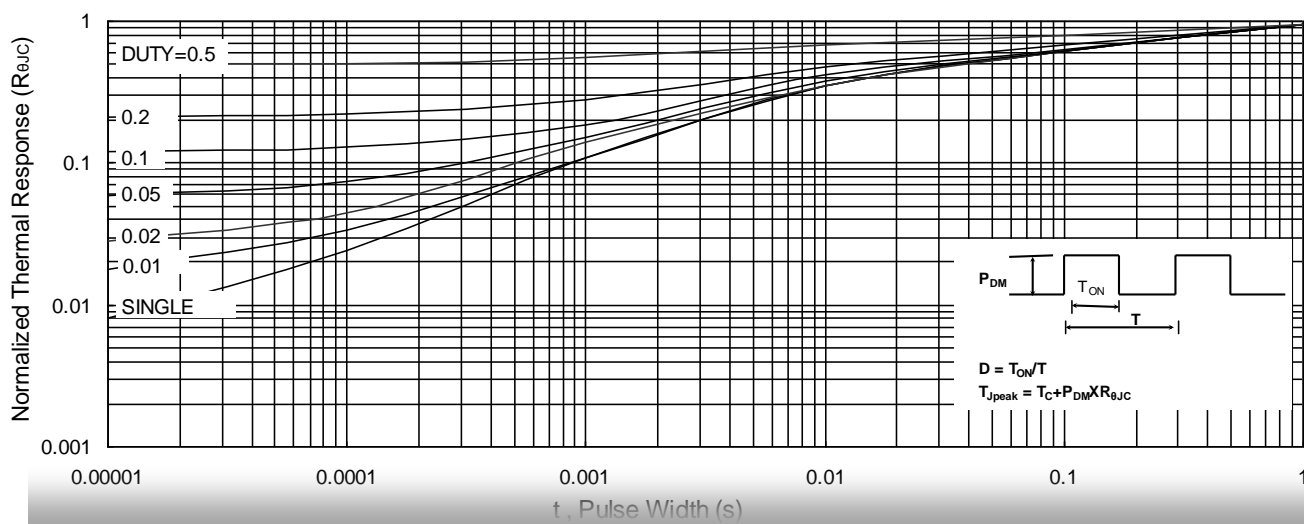


Fig.9 Normalized Maximum Transient Thermal Impedance

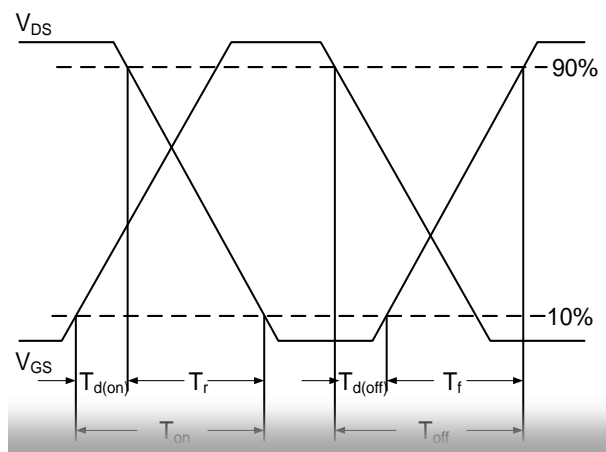


Fig.10 Switching Time Waveform

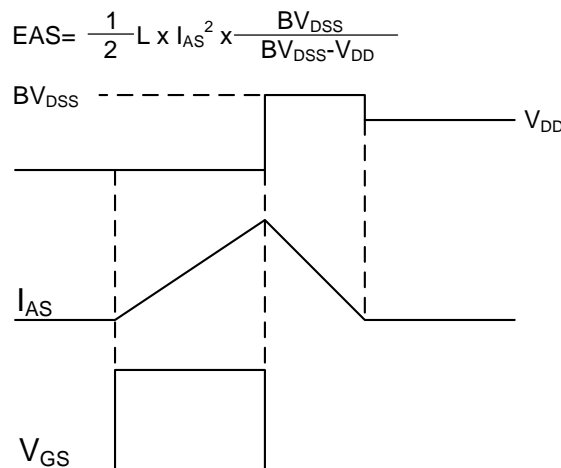
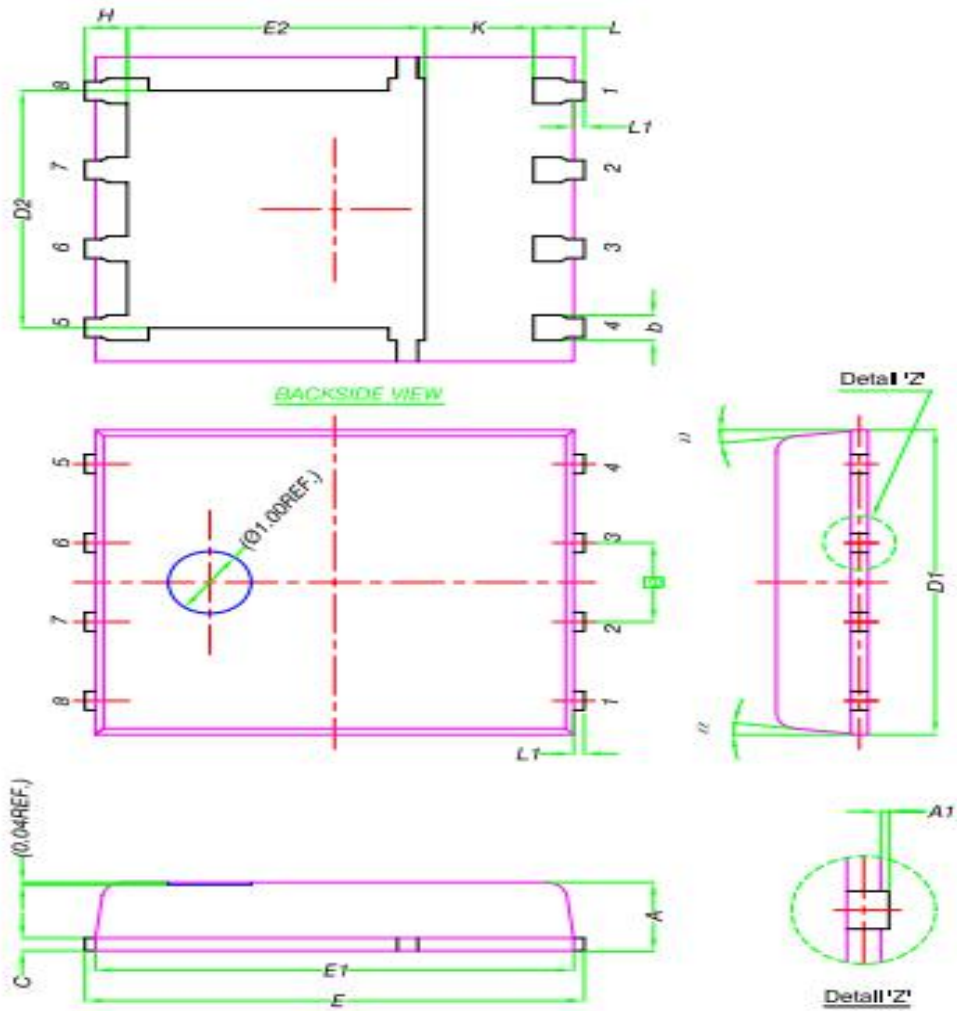


Fig.11 Unclamped Inductive Switching Waveform

●Dimensions (DFN5×6)



DIM.	MILLIMETERS		
	MIN.	NOM.	MAX.
A	0.90	1.00	1.10
AT	0	-	0.05
b	0.33	0.41	0.51
C	0.20	0.25	0.30
D1	4.80	4.90	5.00
D2	3.61	3.81	3.96
E	5.90	6.00	6.10
E1	5.70	5.75	5.80
E2	3.38	3.58	3.78
$\alpha$	1.27 BSC		
H	0.41	0.51	0.61
K	1.10	-	-
L	0.51	0.61	0.71
L1	0.06	0.13	0.20
$\alpha$	0°	-	12°


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