

**• General Description**

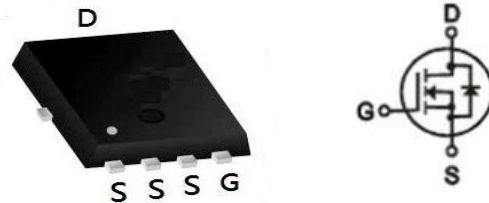
- ★ 100% EAS Guaranteed
- ★ Green Device Available
- ★ Super Low Gate Charge
- ★ Excellent CdV/dt effect decline
- ★ Advanced high cell density Trench technology
- ★ Level: MSL1
- ★ IEC 61249 standard

**• Features**

AGM12T05A designed by the trench processing techniques to achieve extremely low on-resistance. Additional features of this design are a 175°C junction operating temperature, fast switching speed and improved repetitive avalanche rating. These features combine to make this design an extremely efficient and reliable device for use in Motor applications and a wide variety of other applications.

**Product Summary**

BVDSS	RDSON	ID
120V	5.5mΩ	100A

**PRPAK5X6 Pin Configuration**

**Package Marking and Ordering Information**

Device Marking	Device	Device Package	Reel Size	Tape width	Quantity
AGM12T05A	AGM12T05A	DFN5*6	---mm	---mm	3000

**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)	120	V
V <sub>GS</sub>	Gate-Source Voltage (V <sub>DS</sub> =0V)	+20 / -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)	63	A
IDM (pulse)	Drain Current-Continuous@ Current-Pulsed (Note 2)	400	A
P <sub>D</sub>	Maximum Power Dissipation(T <sub>C</sub> =25°C)	150	W
	Maximum Power Dissipation(T <sub>C</sub> =100°C)	1.7	W
E <sub>AS</sub>	Avalanche energy (Note 3)	240	mJ
T <sub>J</sub> , T <sub>STG</sub>	Operating Junction and Storage Temperature Range	-55 To 175	°C

**Table 2. Thermal Characteristic**

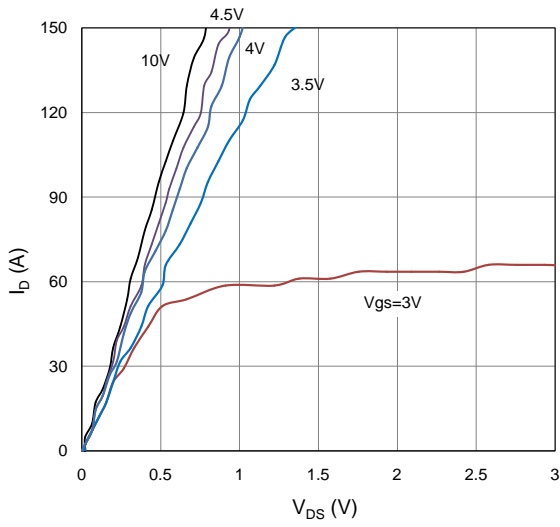
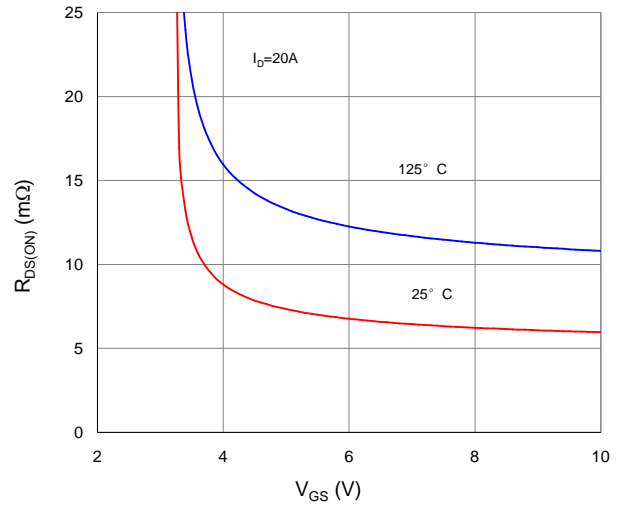
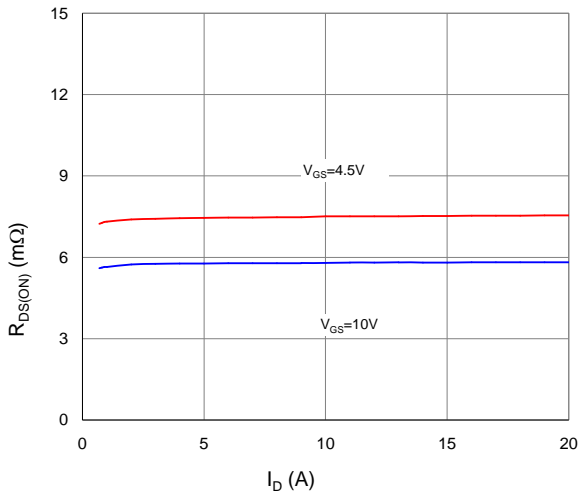
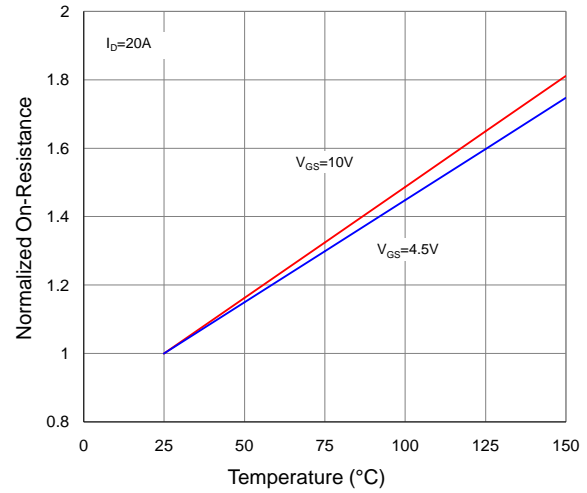
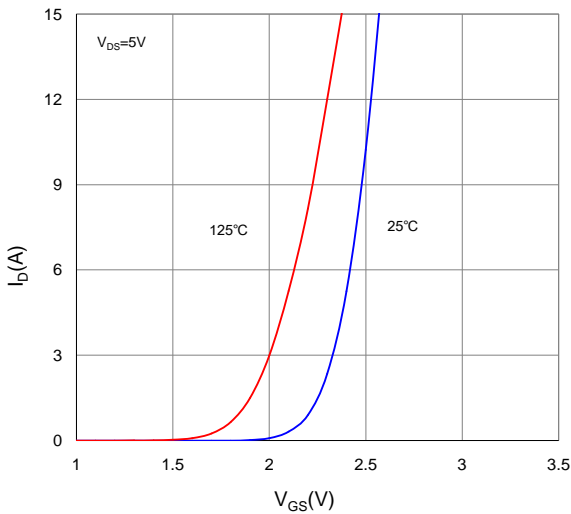
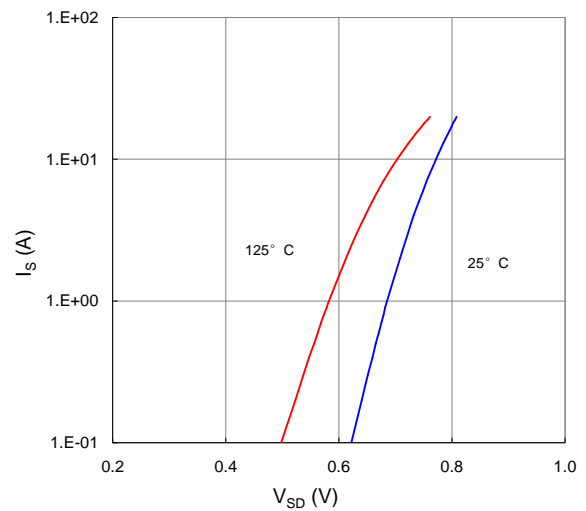
Symbol	Parameter	Typ	Max	Unit
R <sub>θJA</sub>	Thermal Resistance Junction-ambient (Steady State) <sup>1</sup>	---	63	°C/W
R <sub>θJC</sub>	Thermal Resistance Junction-Case <sup>1</sup>	---	1	°C/W

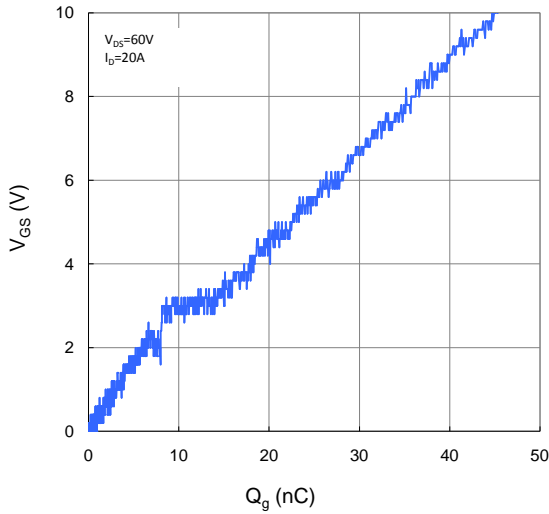
**Table 3. Electrical Characteristics (TA=25°C unless otherwise noted)**

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
<b>On/Off States</b>						
$BV_{DSS}$	Drain-Source Breakdown Voltage	$V_{GS}=0V, I_D=250\mu A$	120			V
$I_{DSS}$	Zero Gate Voltage Drain Current	$V_{DS}=100V, V_{GS}=0V$			1	$\mu A$
$I_{GSS}$	Gate-Body Leakage Current	$V_{GS}=\pm 20V, V_{DS}=0V$			$\pm 100$	nA
$V_{GS(th)}$	Gate Threshold Voltage	$V_{DS}=V_{GS}, I_D=250\mu A$	1.2	1.6	2.5	V
$g_{FS}$	Forward Transconductance	$V_{DS}=10V, I_D=10A$		10		S
$R_{DS(ON)}$	Drain-Source On-State Resistance	$V_{GS}=10V, I_D=20A$		5.5	7.0	m $\Omega$
		$V_{GS}=4.5V, I_D=15A$		7.5	10	m $\Omega$
<b>Dynamic Characteristics</b>						
$C_{iss}$	Input Capacitance	$V_{DS}=60V, V_{GS}=0V, F=1MHz$		3200		pF
$C_{oss}$	Output Capacitance			840		pF
$C_{rss}$	Reverse Transfer Capacitance			31		pF
$R_g$	Gate resistance	$V_{GS}=0V, V_{DS}=0V, f=1.0MHz$		1.7		$\Omega$
<b>Switching Times</b>						
$t_{d(on)}$	Turn-on Delay Time <sup>3, 4</sup>	$V_{GS}=10V, V_{DD}=50V, I_D=1A, R_G=3.3\Omega$		20		nS
$t_r$	Turn-on Rise Time <sup>3, 4</sup>			13		nS
$t_{d(off)}$	Turn-Off Delay Time			36		nS
$t_f$	Turn-Off Fall Time			18		nS
$Q_g$	Total Gate Charge	$V_{GS}=60V, V_{DS}=10V, I_D=20A$		88		nC
$Q_{gs}$	Gate-Source Charge			10		nC
$Q_{gd}$	Gate-Drain Charge			24		nC
<b>Source-Drain Diode Characteristics</b>						
$I_{SD}$	Source-Drain Current(Body Diode)				100	A
$V_{SD}$	Forward on Voltage	$V_{GS}=0V, I_S=20A$			1	V
$t_{rr}$	Reverse Recovery Time	$I_F=-15A, di/dt=100A/\mu s, T_J=25^\circ C$			43	ns
$Q_{rr}$	Reverse Recovery Charge				88	nc

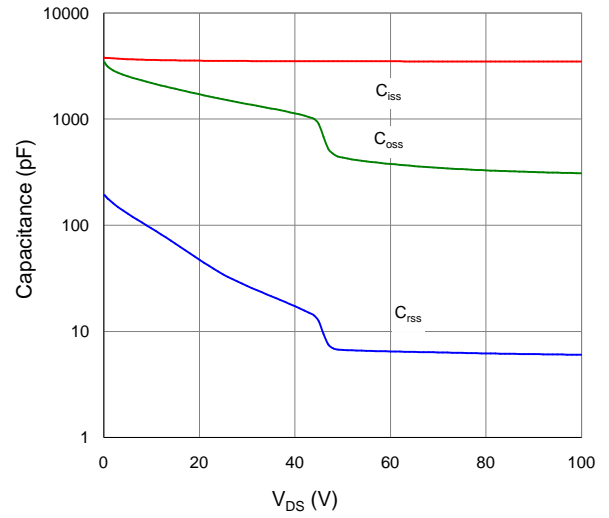
Note :

1. Repetitive Rating : Pulsed width limited by maximum junction temperature.
2.  $V_{DD}=50V, V_{GS}=10V, L=0.1mH, I_{AS}=55A, R_G=25\Omega, \text{Starting } T_J=25^\circ C$ .
3. The data tested by pulsed , pulse width  $\leq 300\mu s$  , duty cycle  $\leq 2\%$ .
4. Essentially independent of operating temperature.

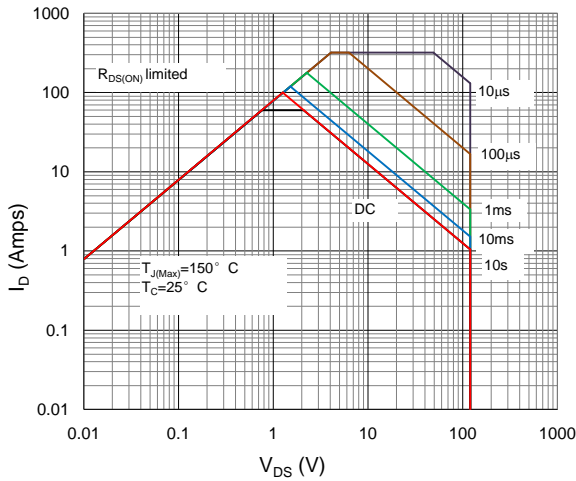

**Fig.1 Typical Output Characteristics**

**Fig.2 On-Resistance vs. Gate-Source Voltage**

**Fig.3 On-Resistance vs. Drain Current and Gate Voltage**

**Fig.4 Normalized On-Resistance vs. Junction Temperature**

**Fig.5 Typical Transfer Characteristics**

**Fig.6 Typical Source-Drain Diode Forward Voltage**



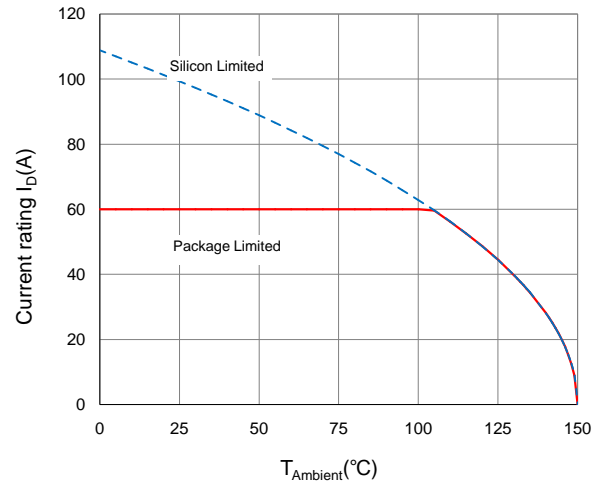
**Fig.7 Typical Gate-Charge vs. Gate-to-Source Voltage**



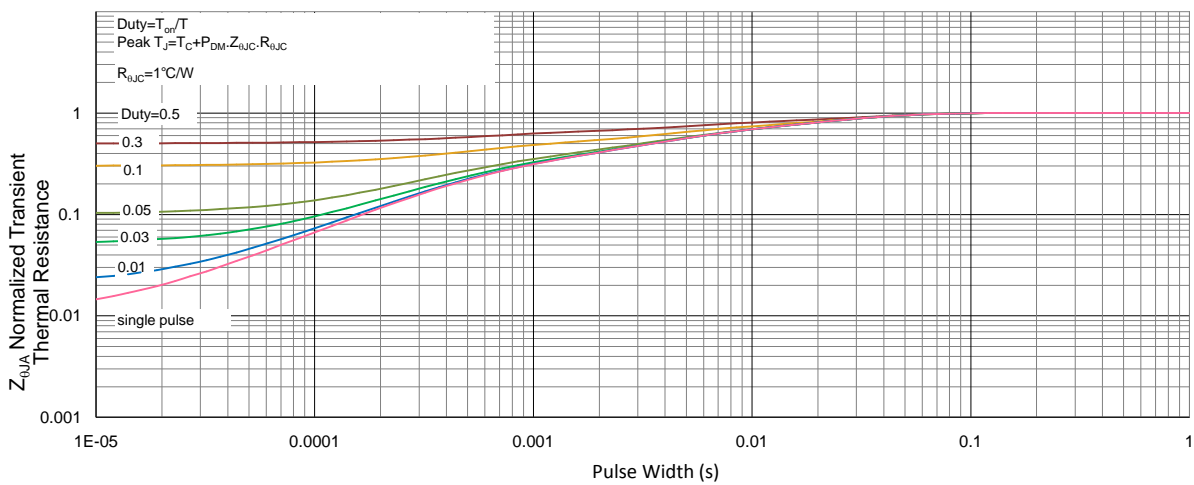
**Fig.8 Typical Capacitance vs. Drain-to-Source Voltage**



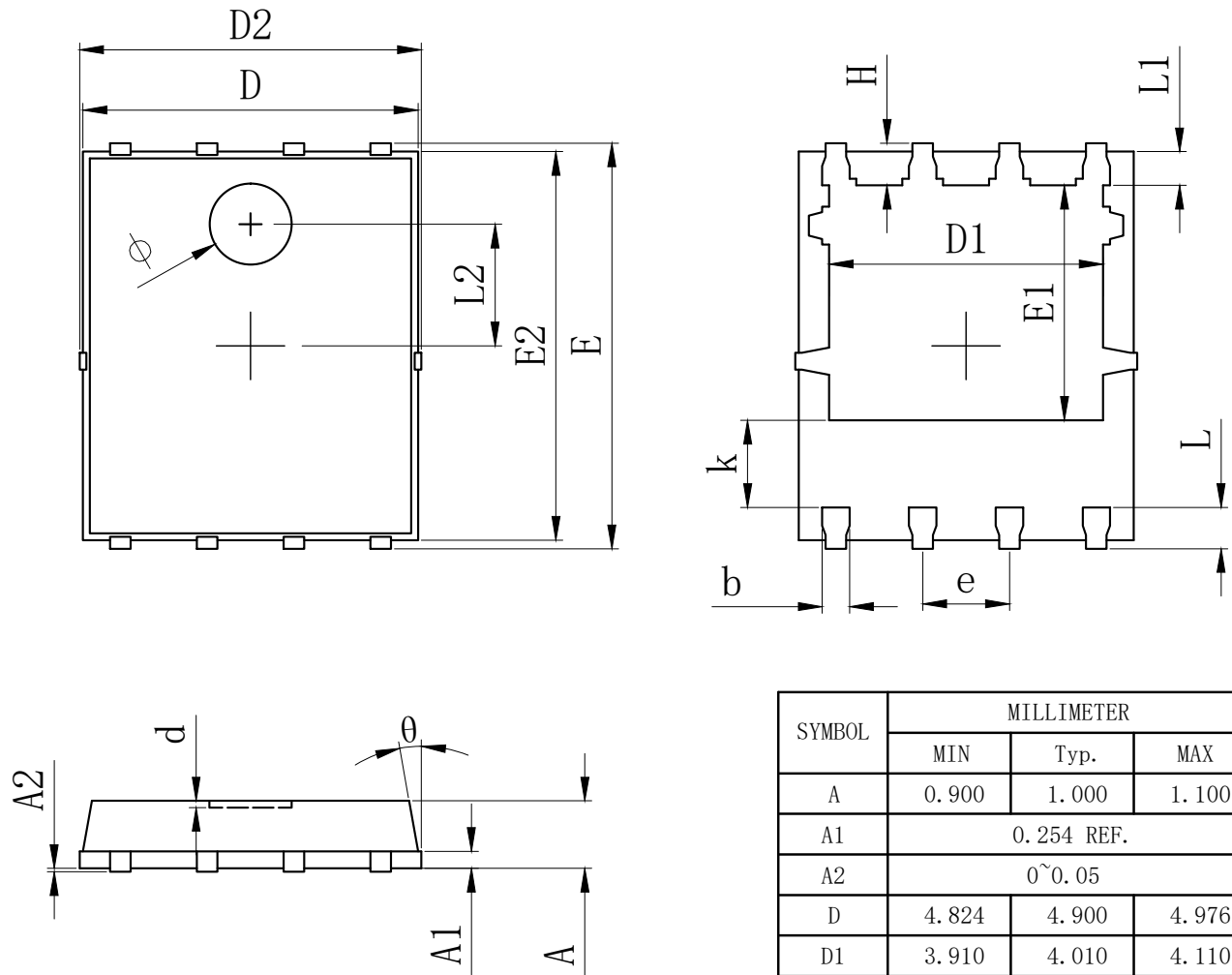
**Fig.9 Maximum Safe Operating Area**



**Fig.10 Maximum Drain Current vs. Case Temperature**



**Fig.11 Normalized Maximum Transient Thermal Impedance, Junction-to-Ambient**



SYMBOL	MILLIMETER		
	MIN	Typ.	MAX
A	0.900	1.000	1.100
A1	0.254 REF.		
A2	0~0.05		
D	4.824	4.900	4.976
D1	3.910	4.010	4.110
D2	4.924	5.000	5.076
E	5.924	6.000	6.076
E1	3.375	3.475	3.575
E2	5.674	5.750	5.826
b	0.350	0.400	0.450
e	1.270 TYP.		
L	0.534	0.610	0.686
L1	0.424	0.500	0.576
L2	1.800 REF.		
k	1.190	1.290	1.390
H	0.549	0.625	0.701
θ	8°	10°	12°
φ	1.100	1.200	1.300
d			0.100


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