

### ● General Description

The AGM12T05C 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

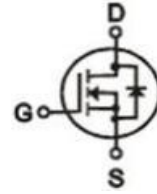
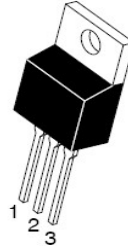
### ● Application

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

### Product Summary

BVDSS	RDSON	ID
120V	5.5mΩ	100A

### TO-220C Pin Configuration



### Package Marking and Ordering Information

Device Marking	Device	Device Package	Reel Size	Tape width	Quantity
AGM12T05C	AGM12T05C	TO-220C	----	----	1000

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

Symbol	Parameter	Value	Unit
VDS	Drain-Source Voltage (VGS=0V)	120	V
VGS	Gate-Source Voltage (VDS=0V)	±20	V
ID	Drain Current-Continuous(Tc=25°C) <b>(Note 1)</b>	100	A
	Drain Current-Continuous(Tc=100°C)	63	A
IDM (pluse)	Drain Current-Continuous@ Current-Pulsed <b>(Note 2)</b>	400	A
PD	Maximum Power Dissipation(Tc=25°C)	125	w
	Maximum Power Dissipation(Tc=100°C)	50	w
EAS	Avalanche energy <b>(Note 3)</b>	240	mJ
TJ,TSTG	Operating Junction and Storage Temperature Range	-55 To 150	°C

**Table 2. Thermal Characteristic**

Symbol	Parameter	Typ	Max	Unit
RθJA	Thermal Resistance Junction-ambient (Steady State) <sup>1</sup>	---	63	°C/W
RθJC	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>						
BVDSS	Drain-Source Breakdown Voltage	VGS=0V ID=250μA	120	--	--	V
IDSS	Zero Gate Voltage Drain Current	VDS=100V,VGS=0V	--	--	1	μA
IGSS	Gate-Body Leakage Current	VGS=±20V,VDS=0V	--	--	±100	nA
VGS(th)	Gate Threshold Voltage	VDS=VGS,ID=250μA	1.2	1.6	2.5	V
gFS	Forward Transconductance	VDS=5V,ID=20A	--	10	--	S
RDS(on)	Drain-Source On-State Resistance	VGS=10V, ID=20A	--	5.5	7.0	mΩ
		VGS=4.5V, ID=15A	--	7.5	10	mΩ
<b>Dynamic Characteristics</b>						
Ciss	Input Capacitance	VDS=60V,VGS=0V, F=1MHZ	--	3200	--	pF
Coss	Output Capacitance		--	840	--	pF
Crss	Reverse Transfer Capacitance		--	31	--	pF
Rg	Gate resistance	VGS=0V, VDS=0V,f=1.0MHz	--	1.7	--	Ω
<b>Switching Times</b>						
td(on)	Turn-on Delay Time	VGS=10V,VDS=50V, ID=1A, RGEN=3.3Ω	--	20	--	nS
tr	Turn-on Rise Time		--	13	--	nS
td(off)	Turn-Off Delay Time		--	36	--	nS
tf	Turn-Off Fall Time		--	18	--	nS
Qg	Total Gate Charge	VGS=60V, VDS=10V, ID=20A	--	88	--	nC
Qgs	Gate-Source Charge		--	10	--	nC
Qgd	Gate-Drain Charge		--	24	--	nC
<b>Source-Drain Diode Characteristics</b>						
ISD	Source-Drain Current(Body Diode)		--	--	100	A
VSD	Forward on Voltage	VGS=0V,IS=20A	--	--	1.0	V
trr	Reverse Recovery Time	IF=15A , dI/dt=100A/μs , TJ=25°C	--	--	43	ns
Qrr	Reverse Recovery Charge		--	--	88	nc

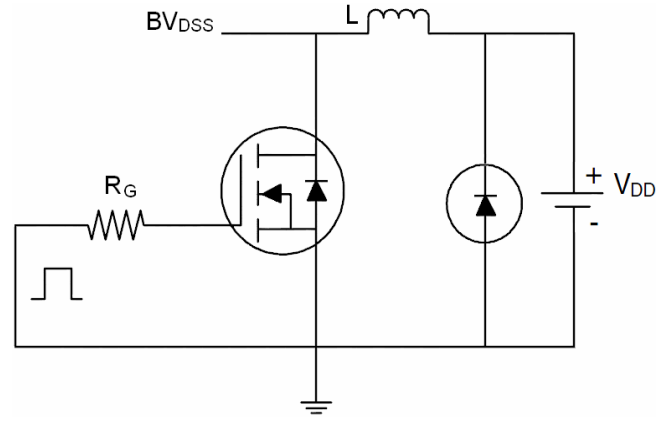
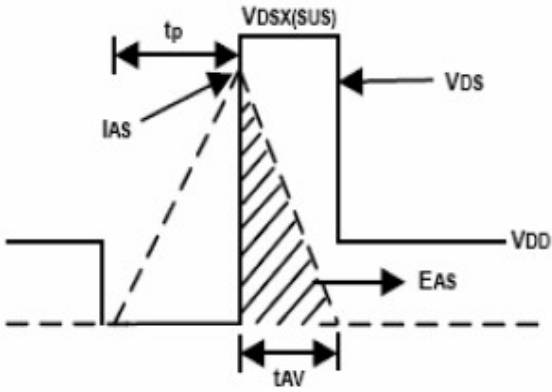
Notes 1.The maximum current rating is package limited.

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

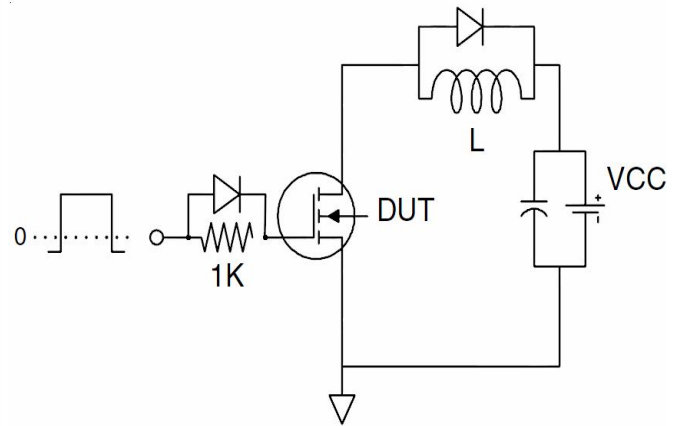
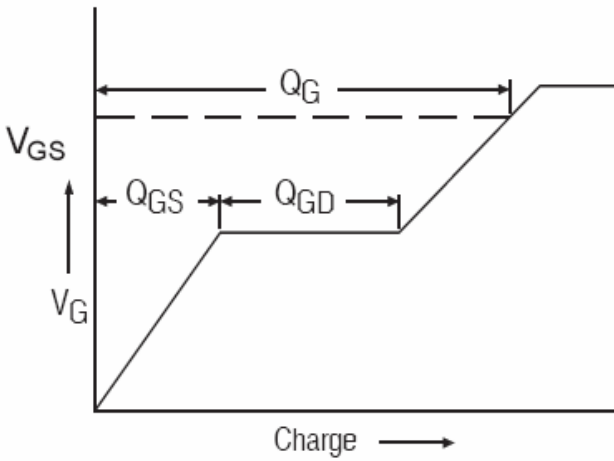
Notes 3.EAS condition: TJ=25°C

## Test Circuit

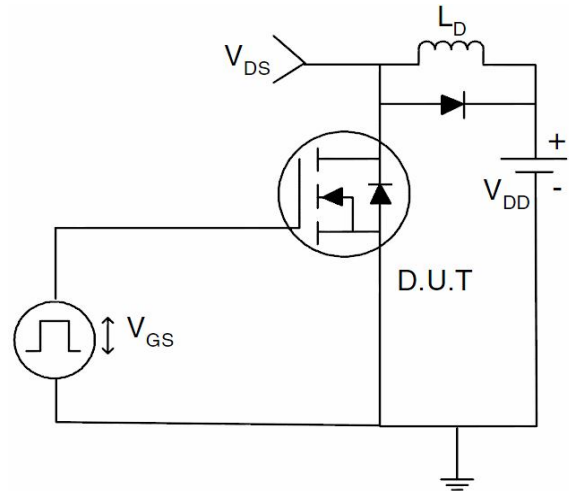
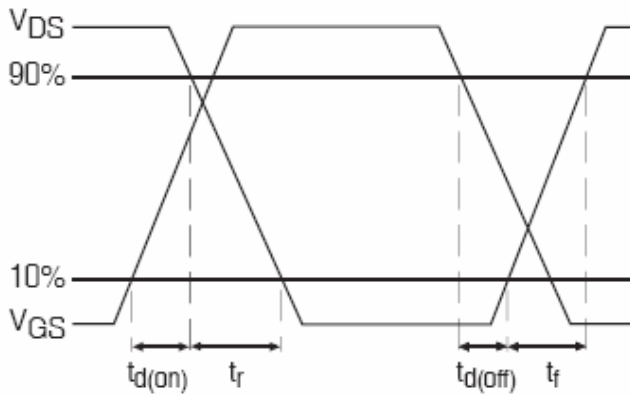
### 1) $E_{AS}$ Test Circuits

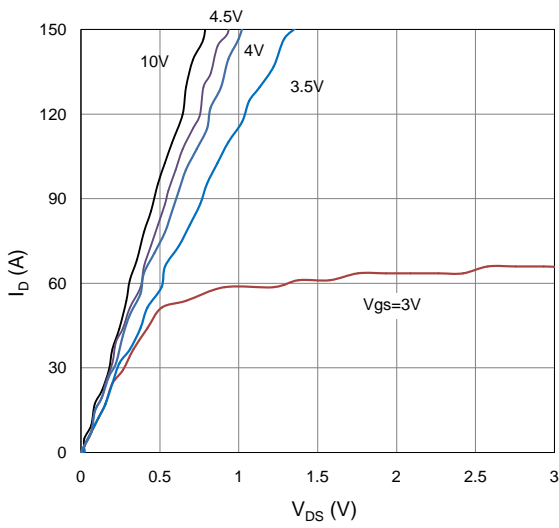
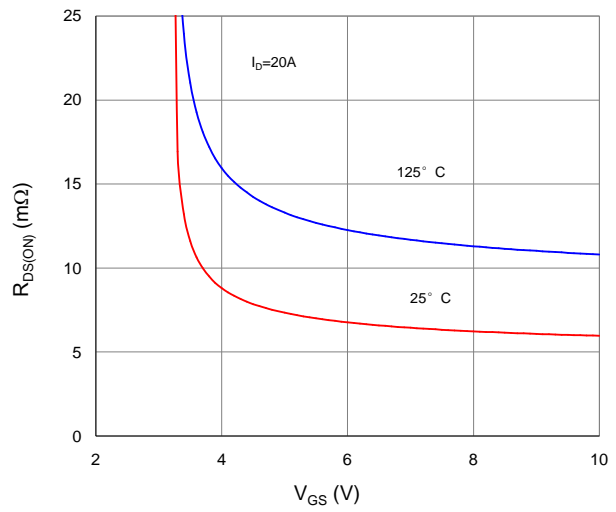
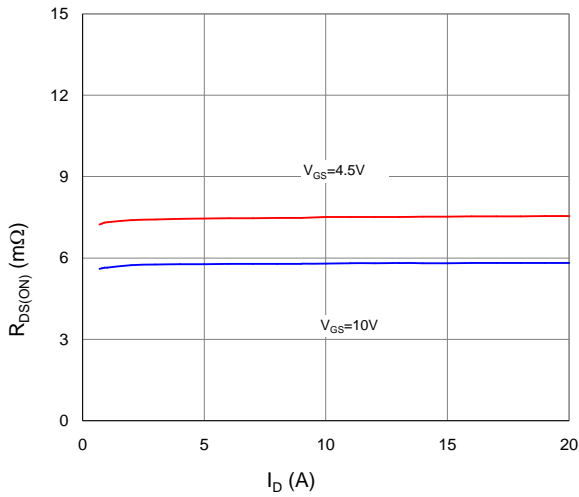
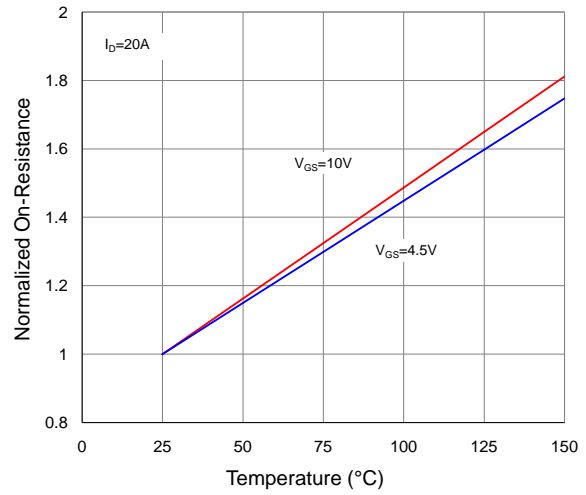
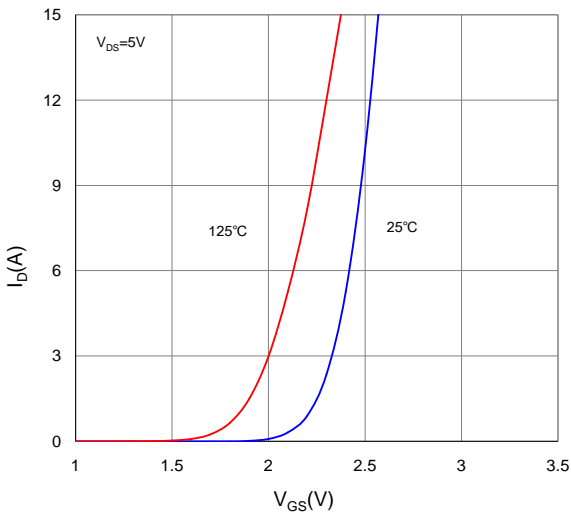
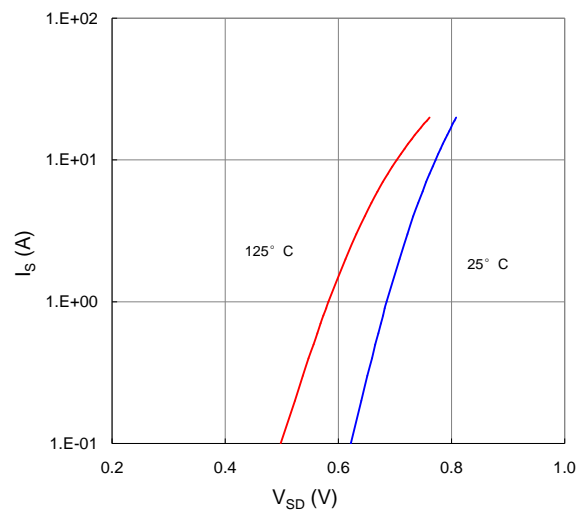


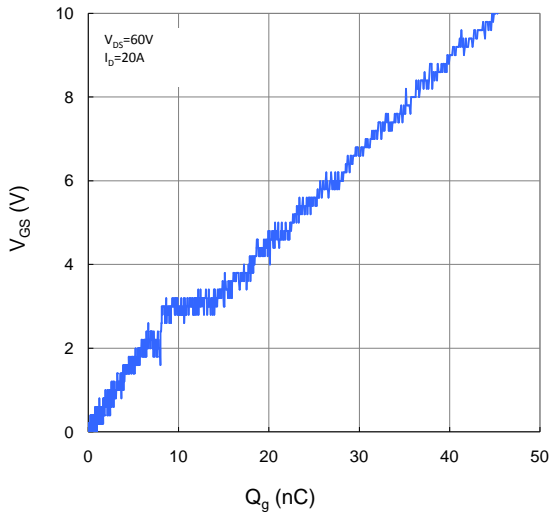
### 2) Gate Charge Test Circuit:



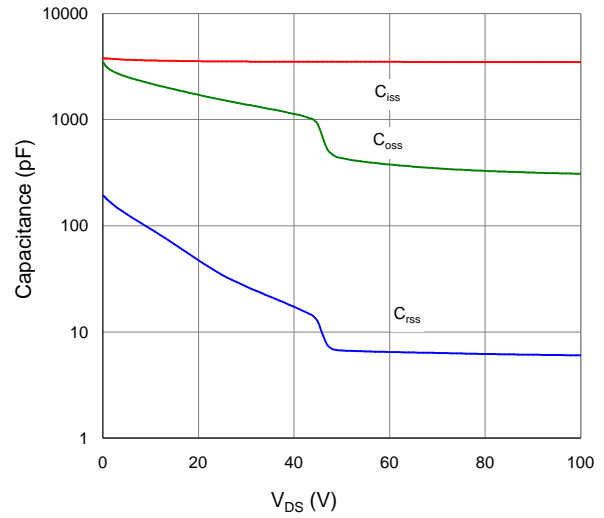
### 3) Switch Time Test Circuit:



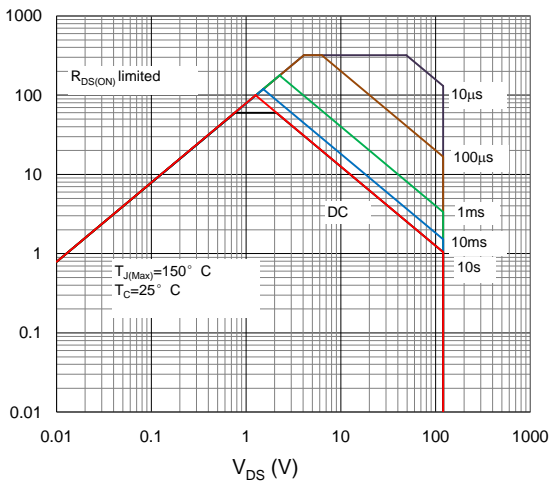

**Fig.1 Typical Output Characteristics**

**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**



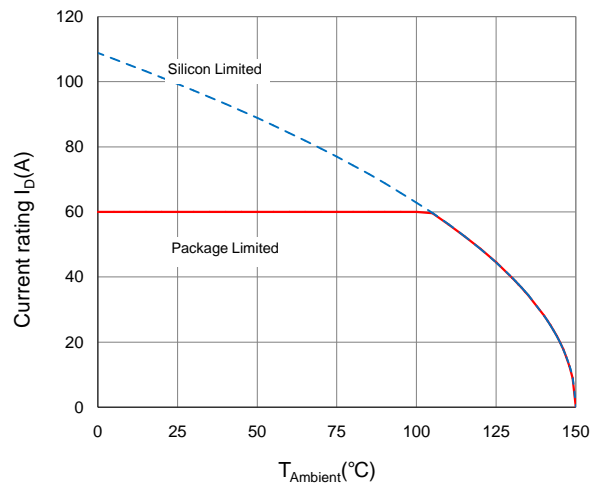
**Fig.7 Typical Gate-Charge vs. Gate-to-Source Voltage**



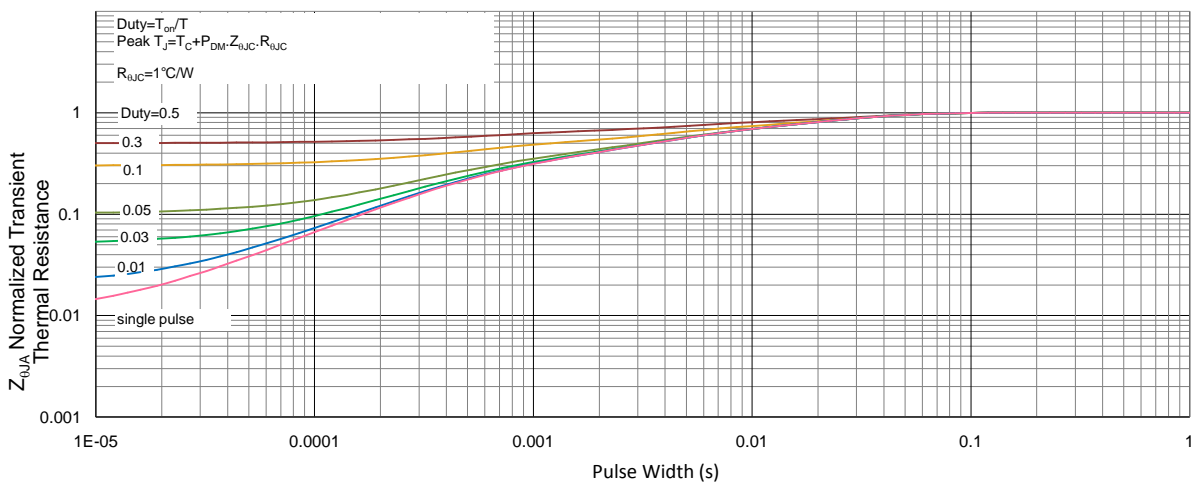
**Fig.8 Typical Capacitance vs. Drain-to-Source Voltage**



**Fig.9 Maximum Safe Operating Area**

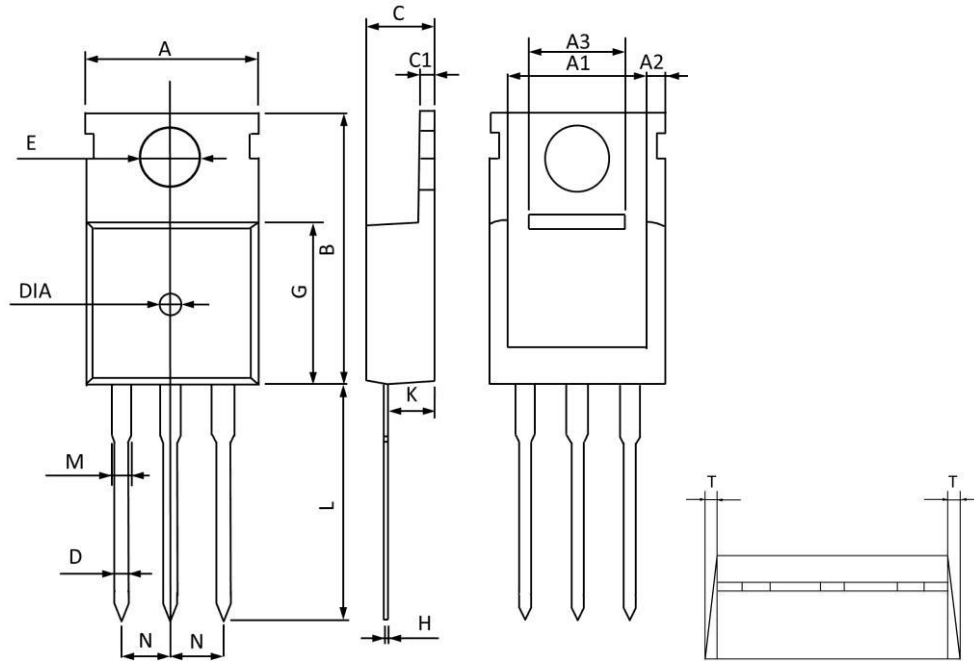


**Fig.10 Maximum Drain Current vs. Case Temperature**



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

## TO220 PACKAGE INFORMATION



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	MAX	MIN	MAX	MIN
A	10.300	9.700	0.406	0.382
A1	8.840	8.440	0.348	0.332
A2	1.250	1.050	0.049	0.041
A3	5.300	5.100	0.209	0.201
B	16.200	15.400	0.638	0.606
C	4.680	4.280	0.184	0.169
C1	1.500	1.100	0.059	0.043
D	1.000	0.600	0.039	0.024
E	3.800	3.400	0.150	0.134
G	9.300	8.700	0.366	0.343
H	0.600	0.400	0.024	0.016
K	2.700	2.100	0.106	0.083
L	13.600	12.800	0.535	0.504
M	1.500	1.100	0.059	0.043
N	2.590	2.490	0.102	0.098
T	W0.35		W0.014	
DIA	Φ1.5 TYP.	deep0.2 TYP.	Φ0.059 TYP.	deep0.008 TYP.


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