General Description

The AGM306C 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

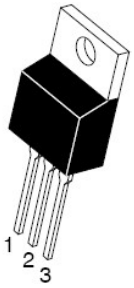
Application

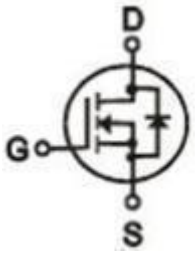
- MB/VGA Vcore
- SMPS 2nd Synchronous Rectifier
- POL application
- BLDC Motor driver

Product Summary

BVDSS	RDSON	ID
30V	5.7mΩ	60A

TO-220 Pin Configuration





Package Marking and Ordering Information

Device Marking	Device	Device Package	Reel Size	Tape width	Quantity
AGM306C	AGM306C	TO-220	-----	-----	1000

Table 1. Absolute Maximum Ratings (TC=25℃)

Symbol	Parameter	Value	Unit
VDS	Drain-Source Voltage (VGS=0V)	30	V
VGS	Gate-Source Voltage (VDS=0V)	±20	V
ID	Drain Current-Continuous(Tc=25℃) **(Note 1)**	60	A
	Drain Current-Continuous(Tc=100℃)	39	A
IDM (pluse)	Drain Current-Continuous@ Current-Pulsed **(Note 2)**	200	A
PD	Maximum Power Dissipation(Tc=25℃)	51	w
	Maximum Power Dissipation(Tc=100℃)	12	w
EAS	Avalanche energy **(Note 3)**	35	mJ
TJ,TSTG	Operating Junction and Storage Temperature Range	-55 To 150	℃

Table 2. Thermal Characteristic

Symbol	Parameter	Typ	Max	Unit
RθJA	Thermal Resistance Junction-ambient (Steady State)[1]	---	35	℃/W
RθJC	Thermal Resistance Junction-Case[1]	---	2.5	℃/W

Table 3. Electrical Characteristics (TA=25℃unless otherwise noted)

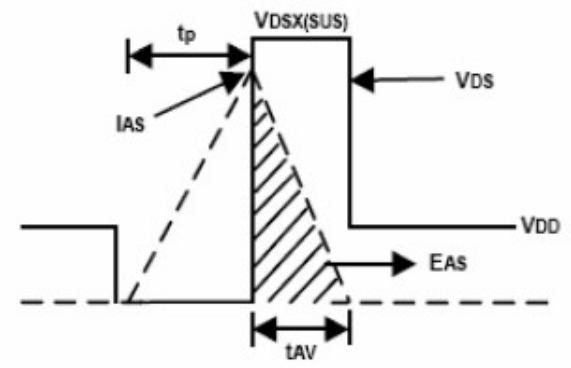
Symbol	Parameter	Conditions	Min	Typ	Max	Unit
On/Off States						
BVDSS	Drain-Source Breakdown Voltage	VGS=0V ID=250μA	30	--	--	V
IDSS	Zero Gate Voltage Drain Current	VDS=30V,VGS=0V	--	--	1.0	μA
IGSS	Gate-Body Leakage Current	VGS=±20V,VDS=0V	--	--	±100	nA
VGS(th)	Gate Threshold Voltage	VDS=VGS,ID=250μA	1.2	1.6	2.1	V
gFS	Forward Transconductance	VDS=5V,ID=20A	--	21	--	S
RDS(on)	Drain-Source On-State Resistance	VGS=10V, ID=20A	--	5.7	7.5	mΩ
		VGS=4.5V, ID=15A	--	8.5	13	mΩ
Dynamic Characteristics						
Ciss	Input Capacitance	VDS=15V,VGS=0V, F=1MHZ	--	1070	--	pF
Coss	Output Capacitance		--	163	--	pF
Crss	Reverse Transfer Capacitance		--	110	--	pF
Rg	Gate resistance	VGS=0V, VDS=0V,f=1.0MHz	--	6.0	--	Ω
Switching Times						
td(on)	Turn-on Delay Time	VGS=10V,VDS=15V RL=0.75Ω,RGEN=3.3Ω	--	9	--	nS
tr	Turn-on Rise Time		--	27	--	nS
td(off)	Turn-Off Delay Time		--	36	--	nS
tf	Turn-Off Fall Time		--	--	--	nS
Qg	Total Gate Charge	VGS=10V, VDS=25V, ID=12A	--	34	--	nC
Qgs	Gate-Source Charge		--	6	--	nC
Qgd	Gate-Drain Charge		--	12	--	nC
Source-Drain Diode Characteristics						
ISD	Source-Drain Current(Body Diode)		--	--	60	A
VSD	Forward on Voltage	VGS=0V,IS=12A	--	--	1.2	V
trr	Reverse Recovery Time	IF=12A , dI/dt=100A/μs , TJ=25℃	--	--	--	ns
Qrr	Reverse Recovery Charge		--	--	--	nc

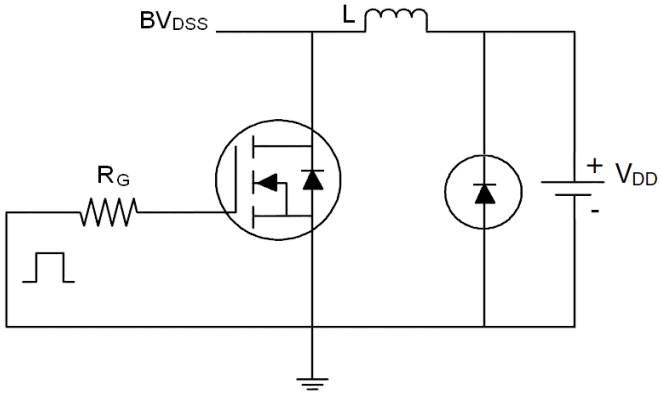
Notes 1.The maximum current rating is package limited.

Notes 2.Repetitive Rating: Pulse width limited by maximum junction temperature Notes 3.EAS condition: TJ=25℃

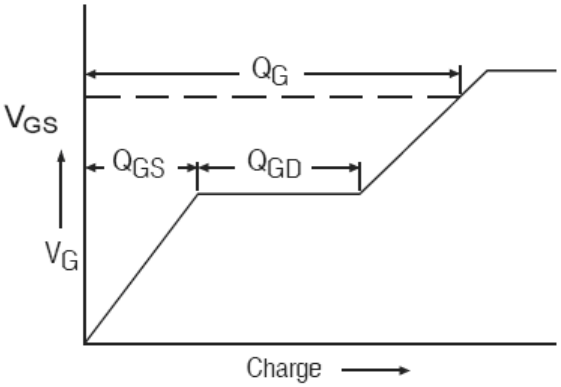
Test Circuit

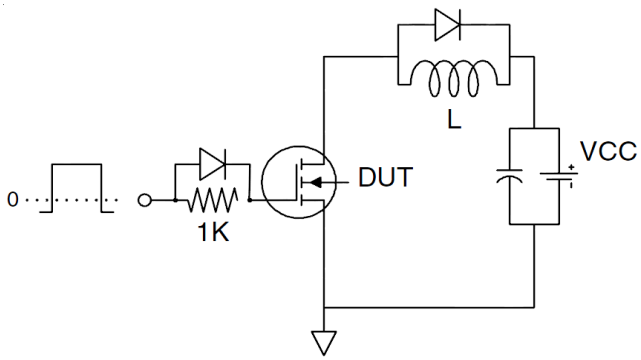
1) E_{AS} Test Circuits



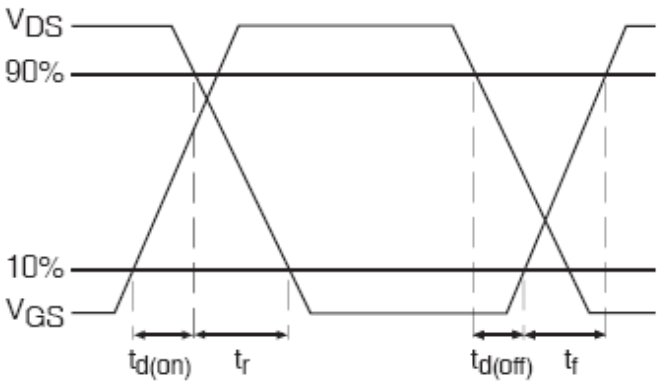


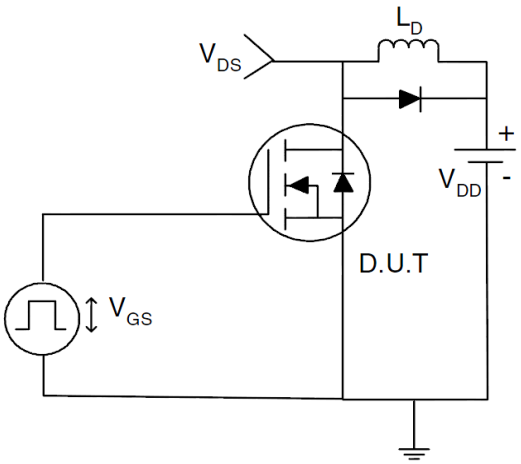
2) Gate Charge Test Circuit:





3) Switch Time Test Circuit:





TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS (Curves)

Figure 1. Output Characteristics

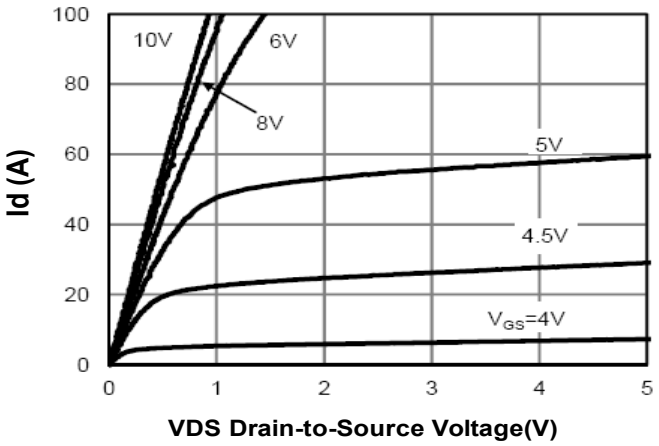


Figure 2. Transfer Characteristics

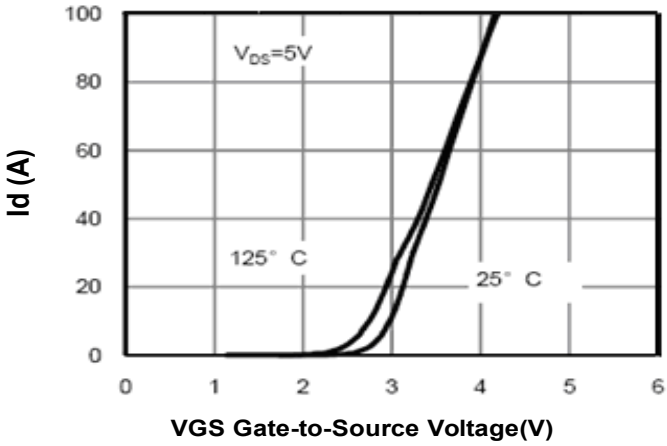


Figure 3. Max BV_{DSS} vs Junction Temperature

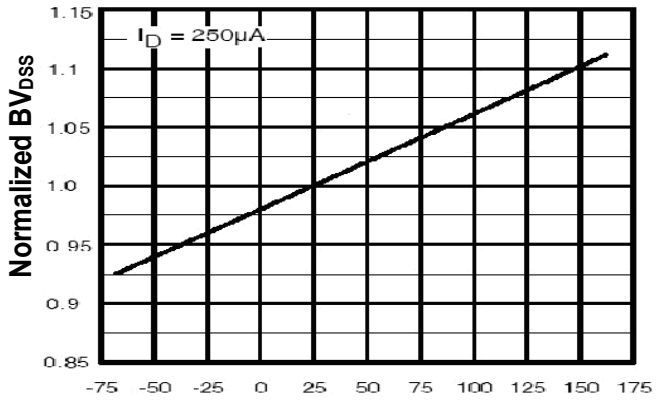


Figure 4. Drain Current

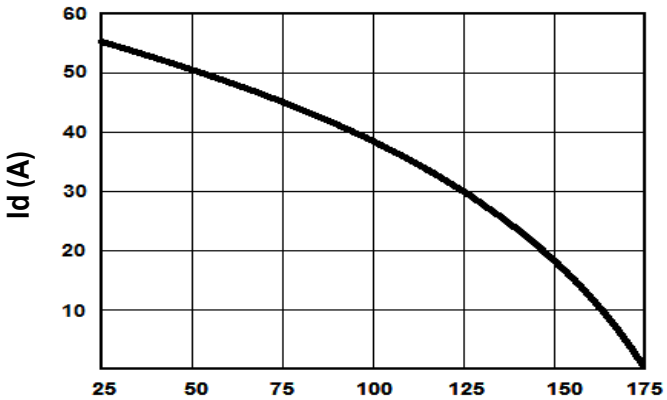


Figure 5. $V_{GS(th)}$ vs Junction Temperature

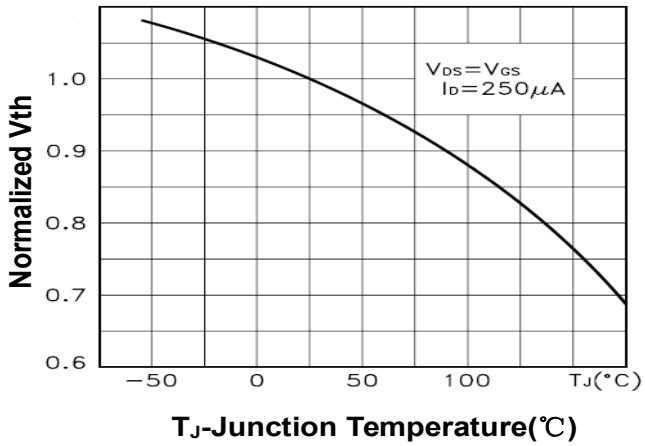


Figure 6. $R_{DS(ON)}$ vs Junction Temperature

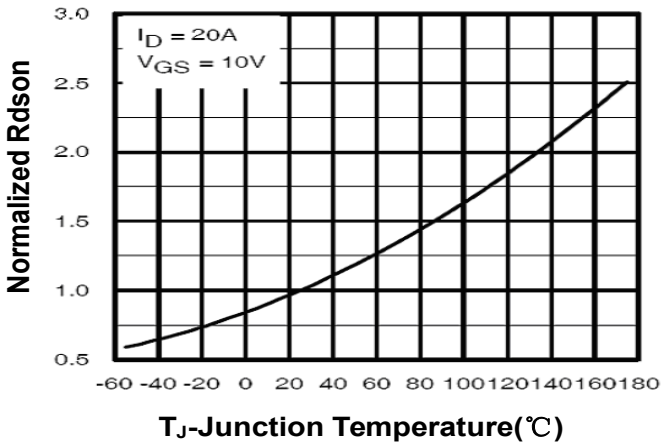


Figure 7. Gate Charge Waveforms

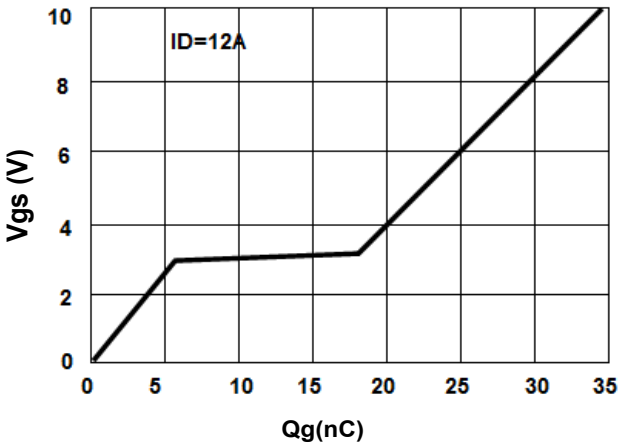


Figure 8. Capacitance

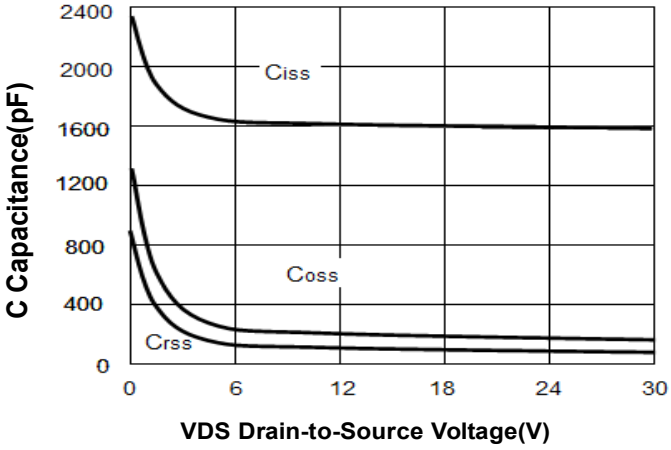


Figure 9. Body-Diode Characteristics

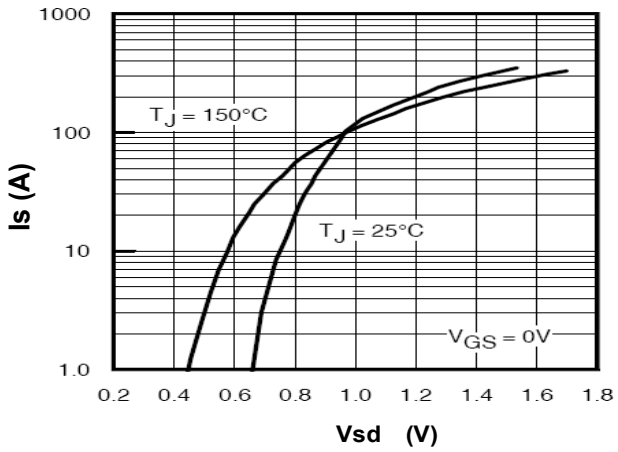


Figure 10. Maximum Safe Operating Area

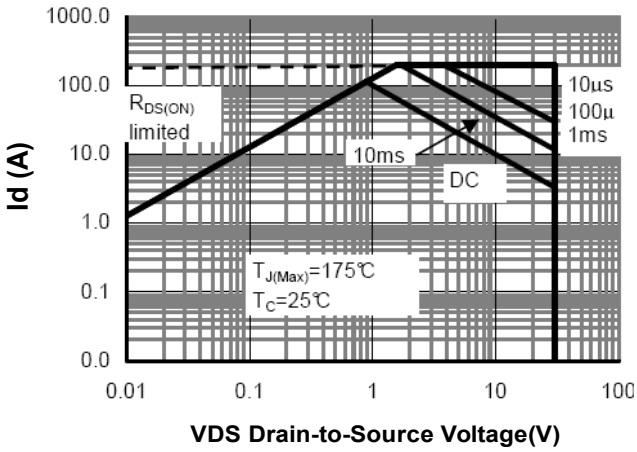
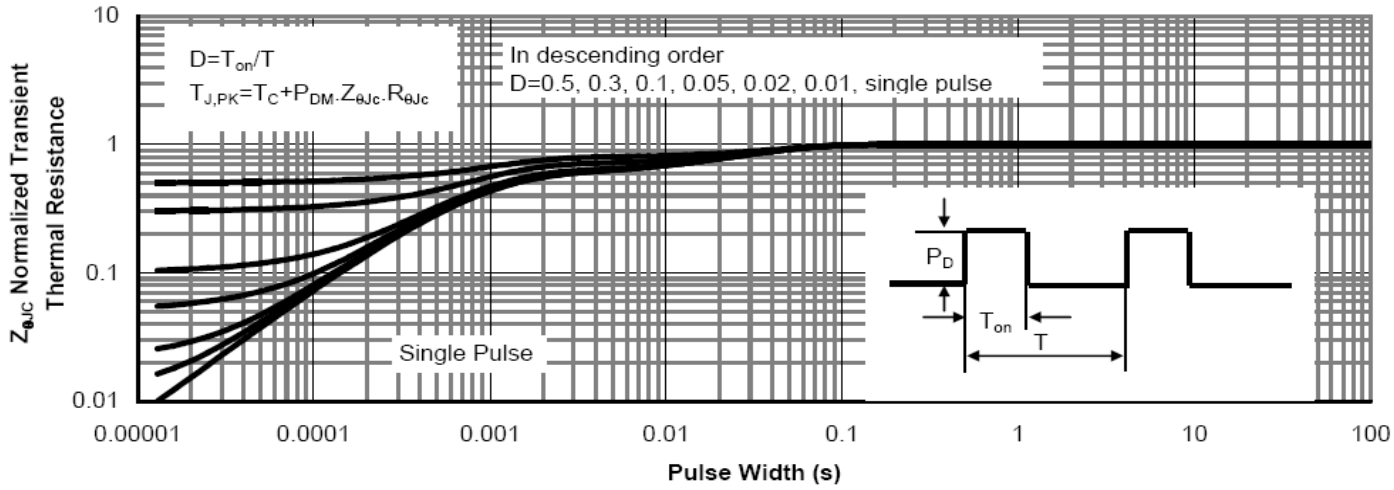
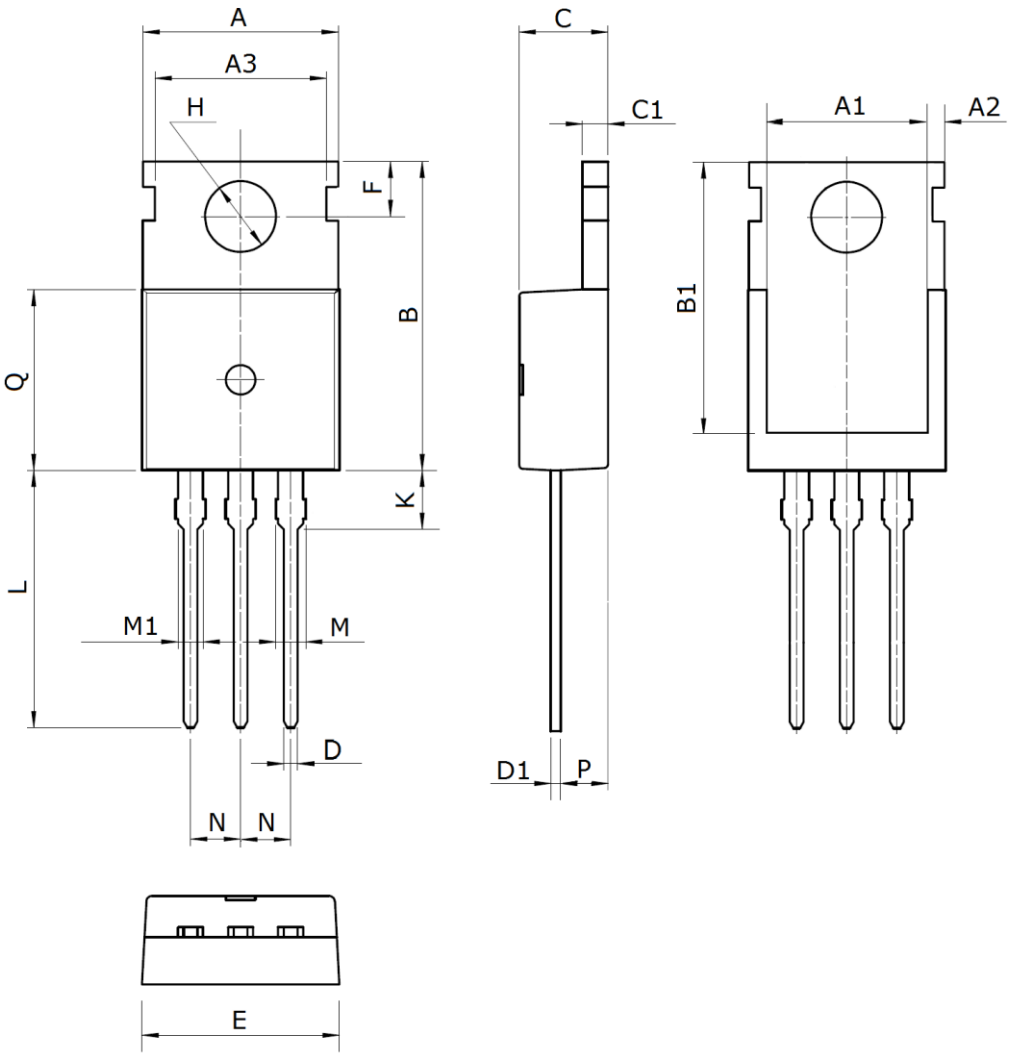


Figure 11. Normalized Maximum Transient Thermal Impedance





Symbol	Dimensions （mm）	Symbol	Dimensions (mm)	Symbol	Dimensions (mm)
A	10.0±0.3	C1	1.3±0.2	L	13.2±0.4
A1	8.0±0.2	D	0.8±0.2	M	1.38±0.1
A2	0.94±0.1	D1	0.5±0.1	M1	1.28±0.1
A3	8.7±0.1	E	10.0±0.3	N	2.54(typ)
B	15.6±0.4	F	**2.8±0.1**	P	2.4±0.3
B1	**13.2±0.2**	H	3.6±0.1	Q	**9.15±0.25**
C	**4.5±0.2**	K	3.1±0.2		

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