

General Description

The AGM65N20C 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
- 100% Avalanche tested
- 100% DVDS tested

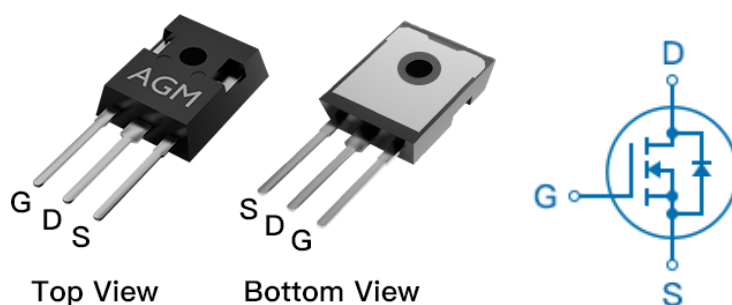
Application

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

Product Summary

BVDSS	RDSON	ID
200V	16mΩ	75A

TO-247 Pin Configuration



Package Marking and Ordering Information

Device Marking	Device	Device Package	Reel Size	Tape width	Quantity
AGM65N20AT	AGM65N20AT	TO-247	---	---	600

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

Symbol	Parameter	Value	Unit
VDS	Drain-Source Voltage (VGS=0V)	200	V
VGS	Gate-Source Voltage (VDS=0V)	±20	V
ID	Drain Current-Continuous(Tc=25°C) (Note 1)	75	A
	Drain Current-Continuous(Tc=100°C)	52	A
IDM (pulse)	Drain Current-Pulsed (Note 2)	300	A
PD	Maximum Power Dissipation(Tc=25°C)	338	w
	Maximum Power Dissipation(Tc=100°C)	135	w
EAS	Avalanche energy (Note 3)	1352	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) ¹	---	40	°C/W
RθJC	Thermal Resistance Junction-Case ¹	---	0.37	°C/W

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

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
On/Off States						
BVDSS	Drain-Source Breakdown Voltage	VGS=0V ID=250μA	200	--	--	V
IDSS	Zero Gate Voltage Drain Current	VDS=200V,VGS=0V	--	--	1	μA
IGSS	Gate-Body Leakage Current	VGS=±20V,VDS=0V	--	--	±100	nA
VGS(th)	Gate Threshold Voltage	VDS=VGS,ID=250μA	3.6	--	5.0	V
gFS	Forward Transconductance	VDS=5V,ID=10A	--	65	--	S
RDS(on)	Drain-Source On-State Resistance	VGS=10V, ID=40A	--	16	20	mΩ
Dynamic Characteristics						
Ciss	Input Capacitance	VDS=25V,VGS=0V, F=1MHZ	--	7500	--	pF
Coss	Output Capacitance		--	500	--	pF
Crss	Reverse Transfer Capacitance		--	210	--	pF
Rg	Gate resistance	VGS=0V, VDS=0V,f=1.0MHz	--	1.3	--	Ω
Switching Times						
td(on)	Turn-on Delay Time	VGS=10V,VDS=50V, ID=40A,RGEN=2.5Ω	--	45	--	nS
tr	Turn-on Rise Time		--	70	--	nS
td(off)	Turn-Off Delay Time		--	110	--	nS
tf	Turn-Off Fall Time		--	90	--	nS
Qg	Total Gate Charge	VGS=10V, VDS=100V, ID=40A	--	85	--	nC
Qgs	Gate-Source Charge		--	15	--	nC
Qgd	Gate-Drain Charge		--	25	--	nC
Source-Drain Diode Characteristics						
ISD	Source-Drain Current(Body Diode)		--	--	75	A
VSD	Forward on Voltage	VGS=0V,IS=40A	--	--	1.2	V
trr	Reverse Recovery Time	IF=40A ,VDD=50V	--	110	--	ns
Qrr	Reverse Recovery Charge	dI/dt=100A/μs , TJ=25℃	--	0.55	--	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: T_J=25°C, V_{DD}=50V, V_{gs}=10V, ID=52A, L=1mH, R_G=25ohm

Test Circuits and Waveforms

Figure A: Gate Charge Test Circuit and Waveform

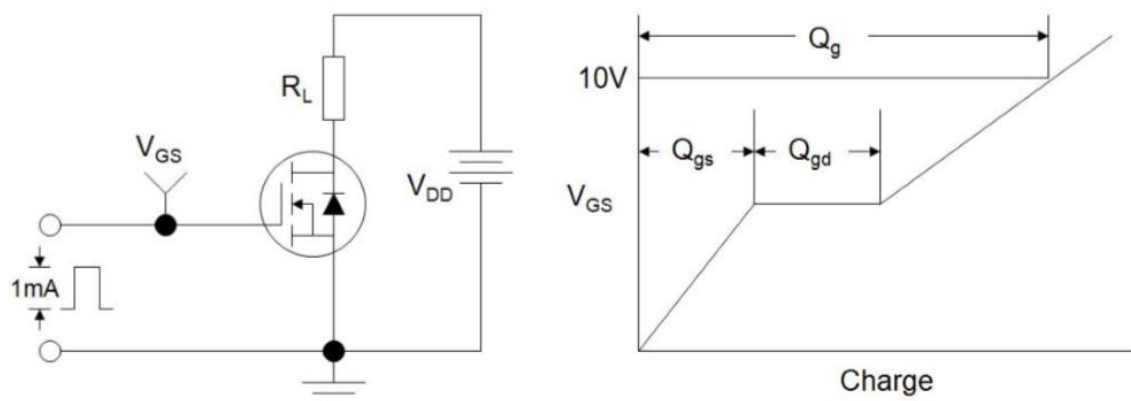


Figure B: Resistive Switching Test Circuit and Waveform

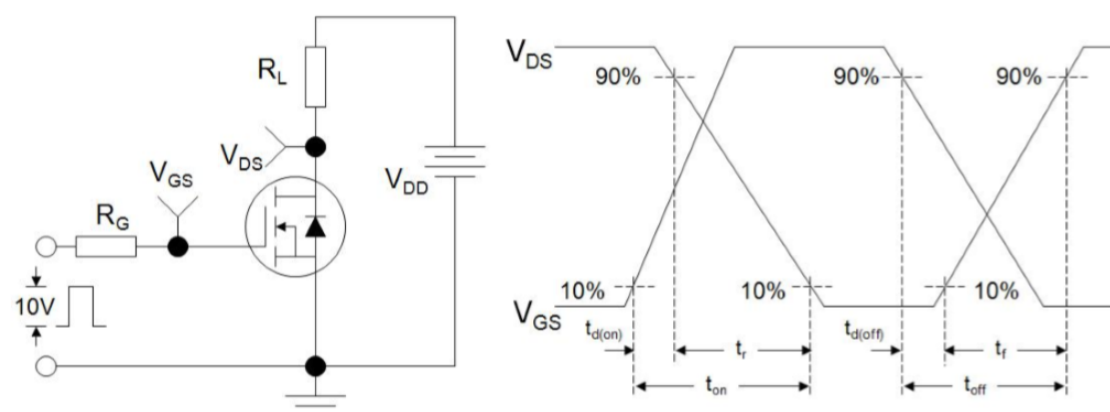
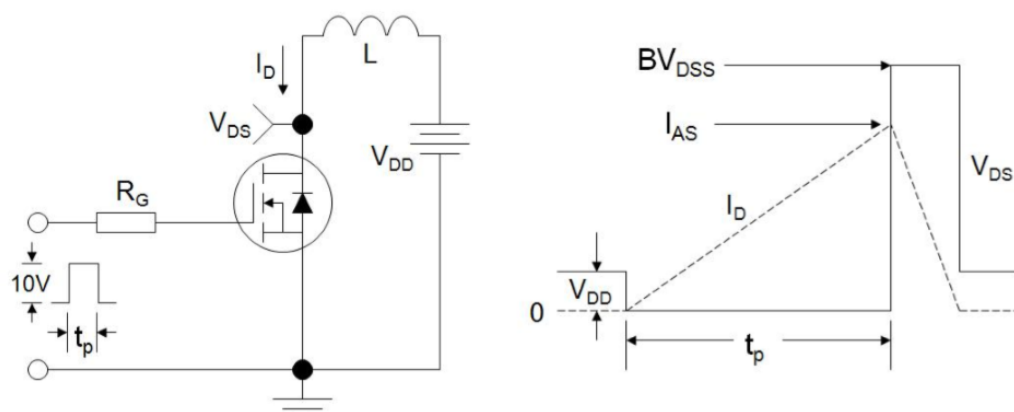


Figure C: Unclamped Inductive Switching Test Circuit and Waveform



Characteristics Curve:

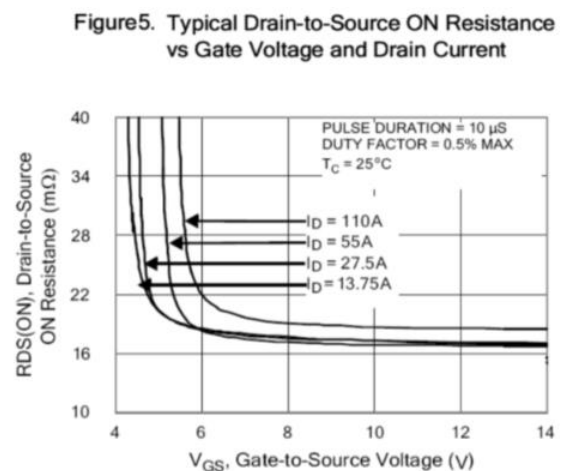
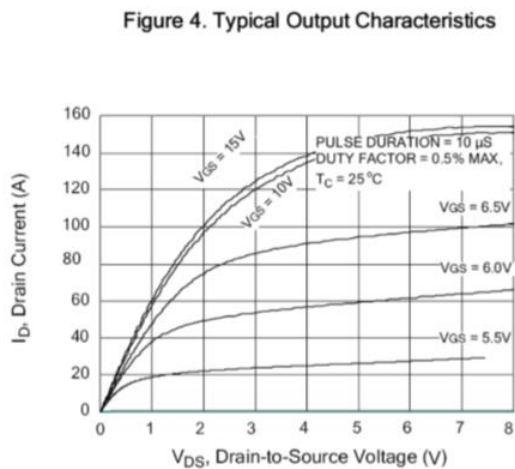
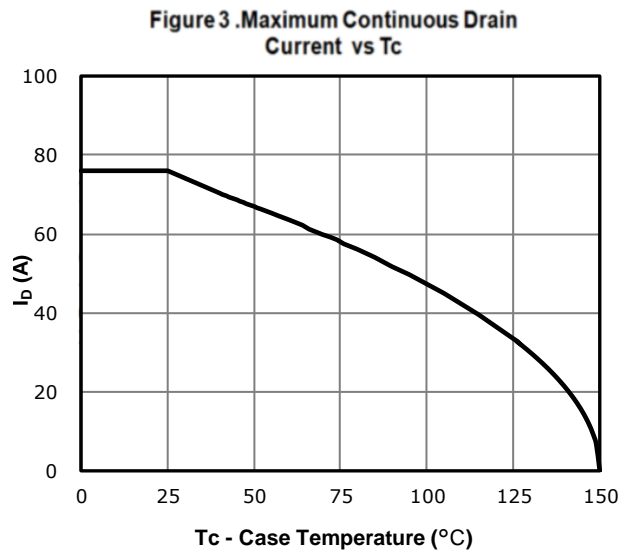
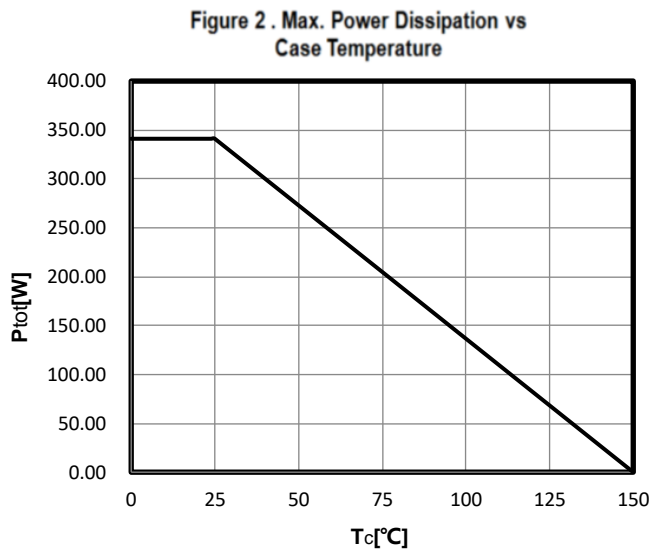
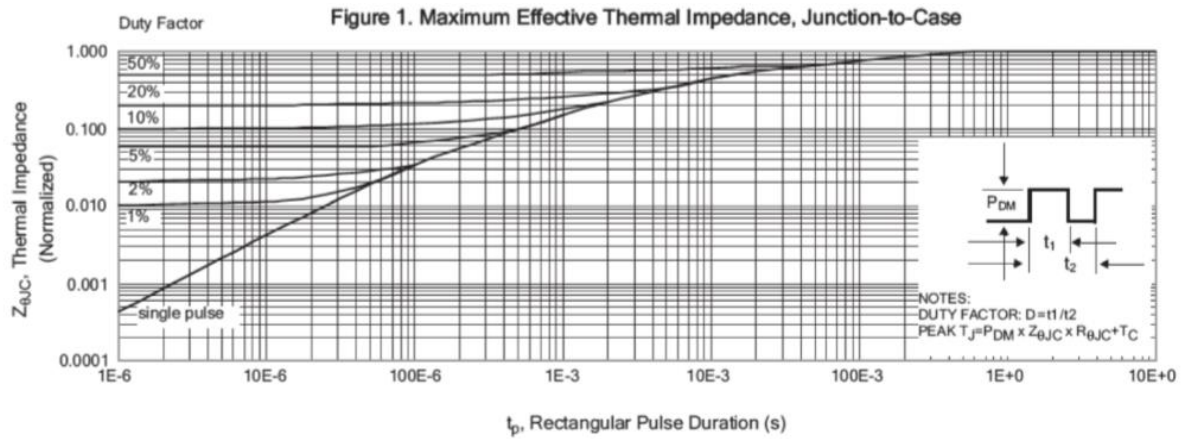


Figure 6. Peak Current Capability

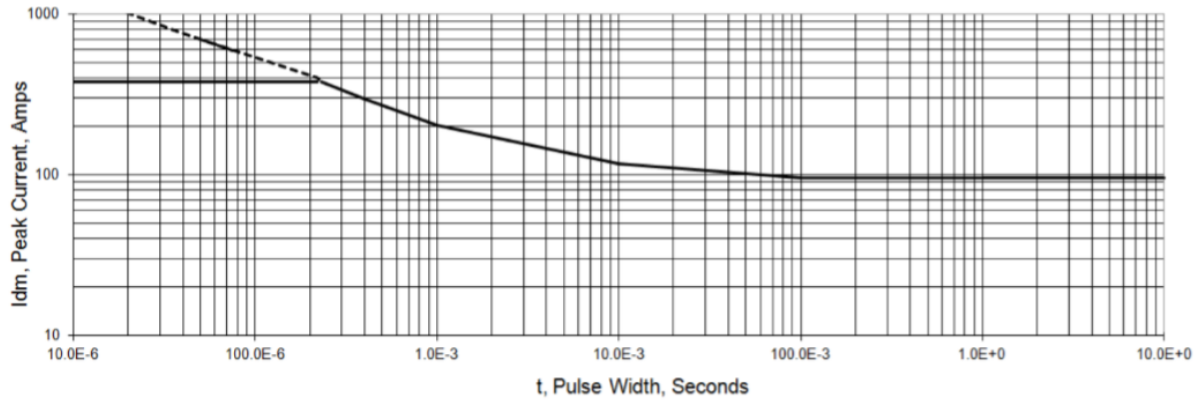


Figure 7. Typical Transfer Characteristics

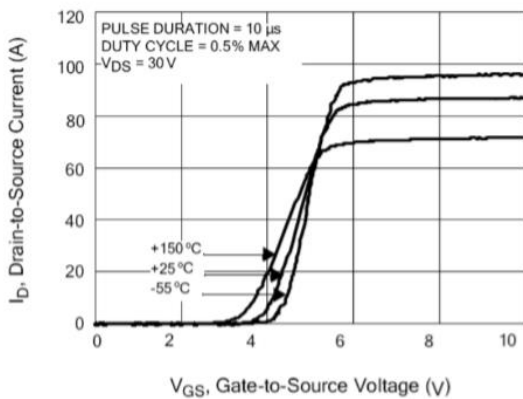


Figure 8. Unclamped Inductive Switching Capability

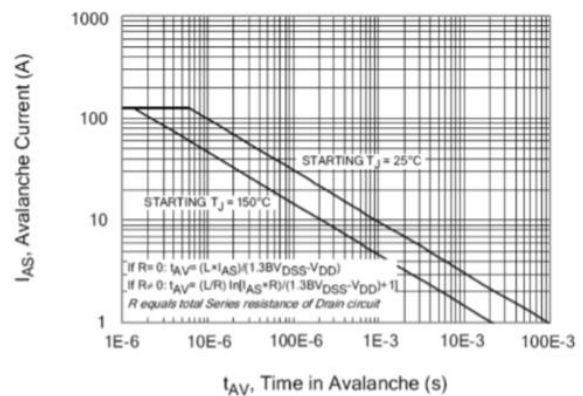


Figure 9. Typical Drain-to-Source ON Resistance vs Drain Current

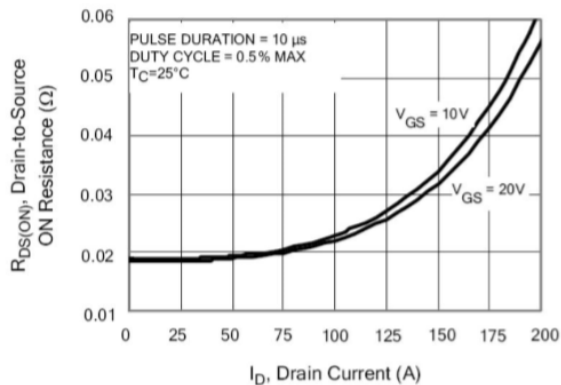


Figure 10. Typical Drain-to-Source ON Resistance vs Junction Temperature

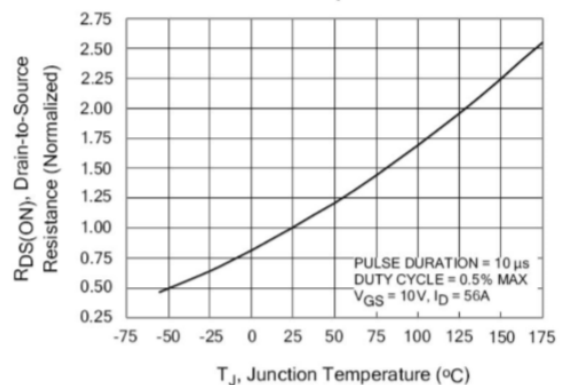


Figure 11. Typical Breakdown Voltage vs Junction Temperature

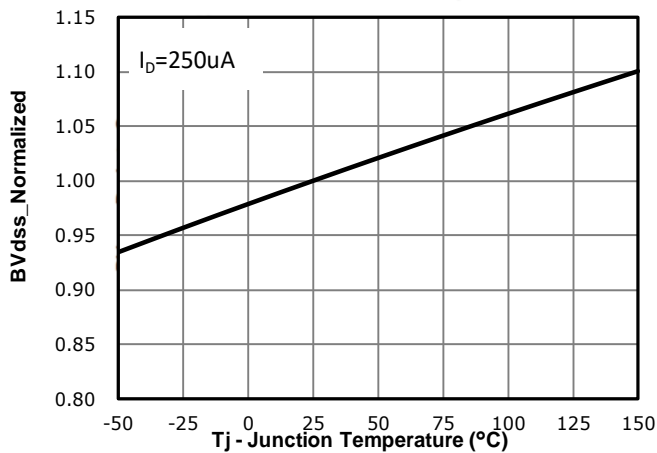


Figure 12. Typical Threshold Voltage vs Junction Temperature

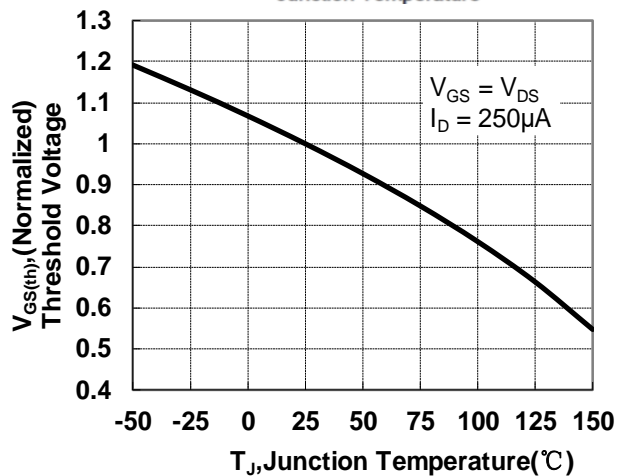


Figure 13 . Maximum Safe Operating Area

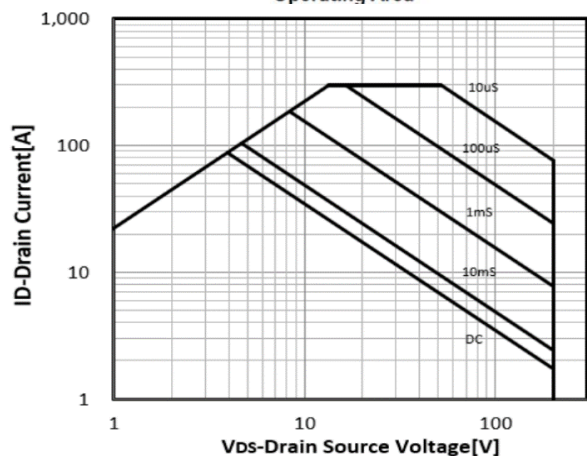


Figure 14. Capacitance vs Vds

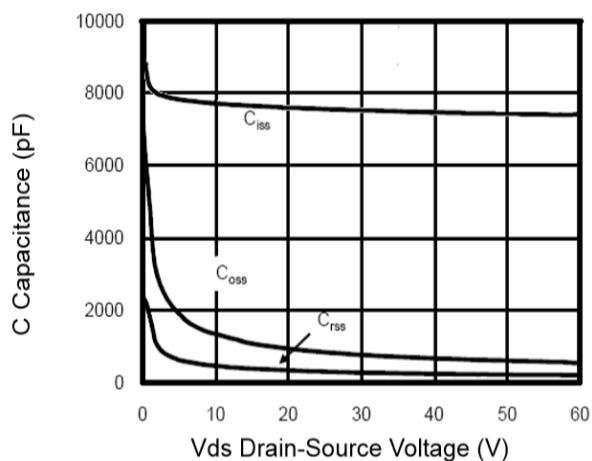


Figure 15 . Typical Gate Charge

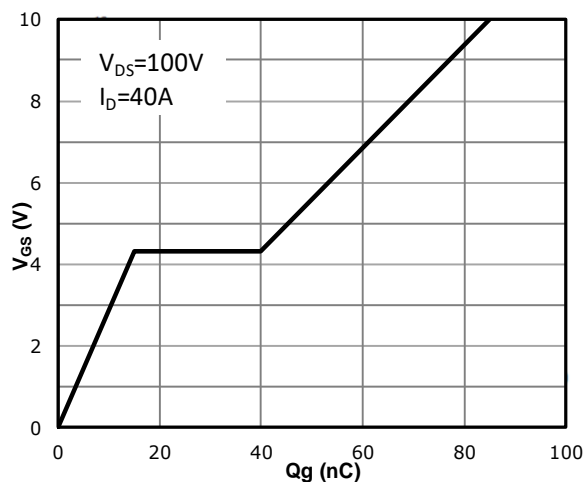
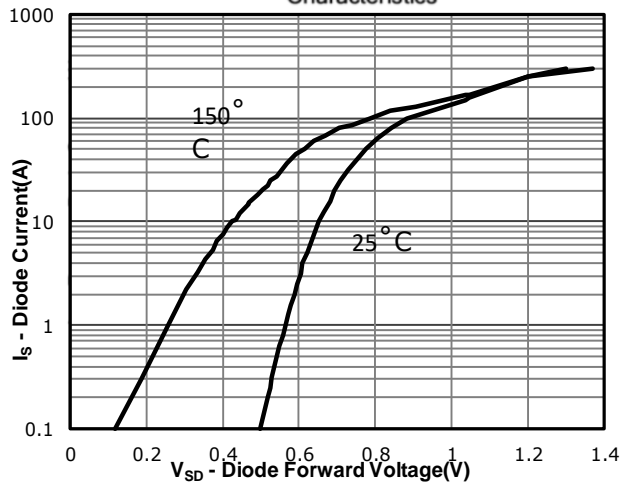
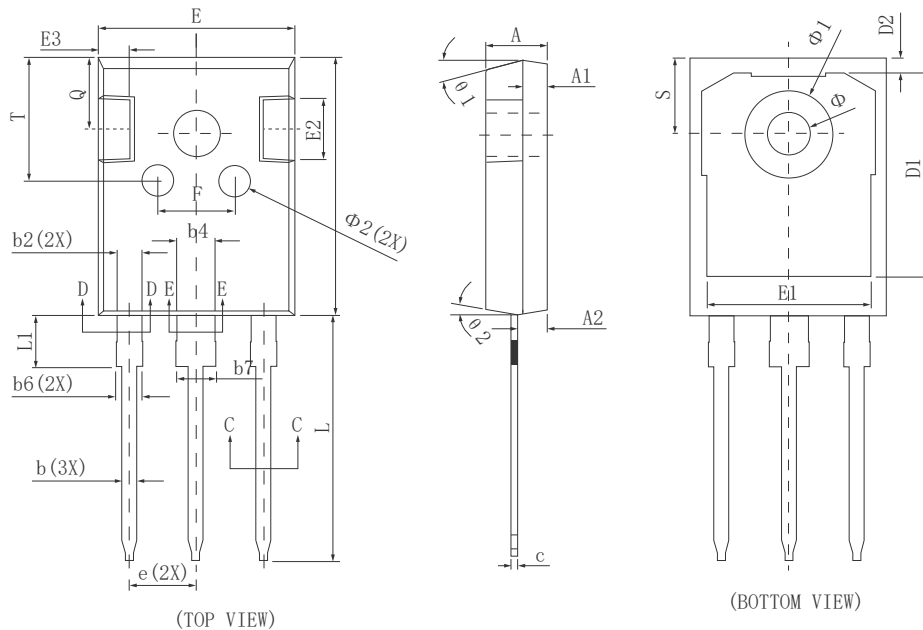


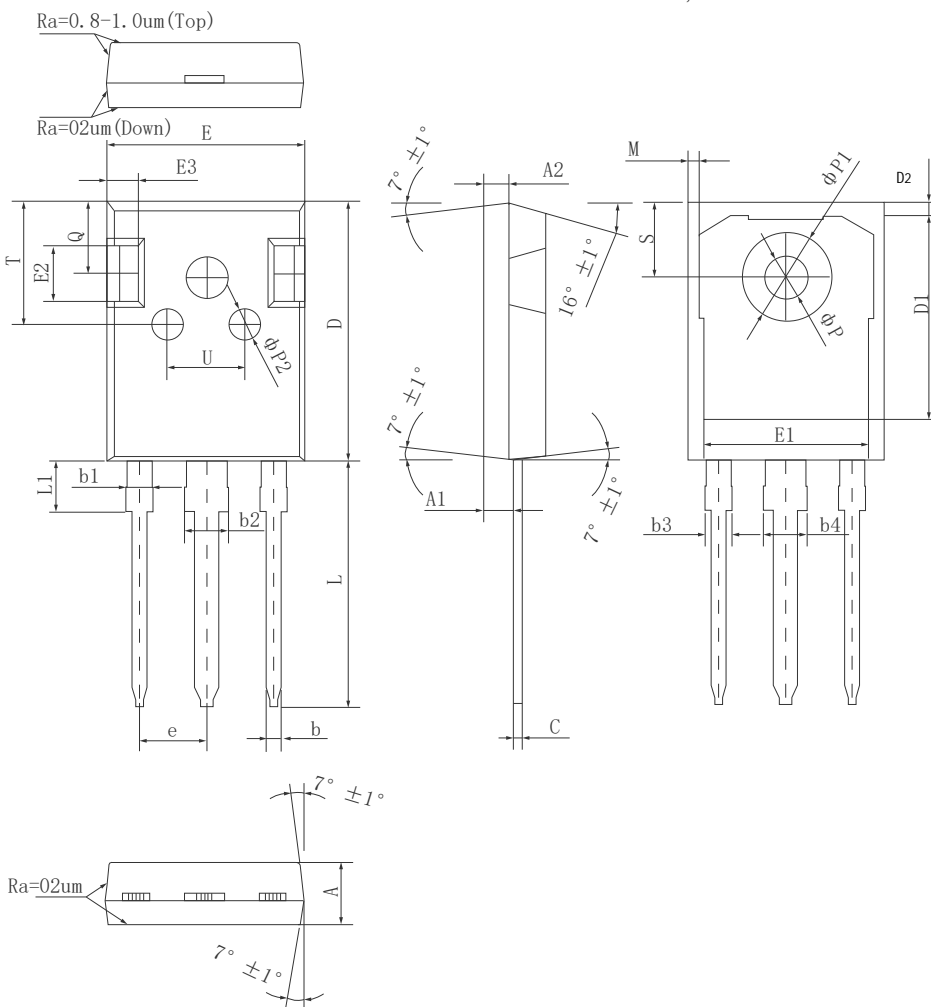
Figure 16. Typical Body Diode Transfer Characteristics



Dimensions (TO-247)



SYMBOL	MILLIMETER		
	MIN	Typ.	MAX
A	4.900	5.000	5.100
A1	1.900	2.000	2.100
A2	2.300	2.400	2.500
b	1.160	-	1.260
b1	1.150	1.200	1.220
b2	1.960	-	2.060
b3	1.950	2.000	2.020
b4	2.960	-	3.060
b5	2.950	3.000	3.020
b6	2.000	2.100	2.250
b7	3.000	3.100	3.250
c	0.590	-	0.660
c1	0.580	0.600	0.620
D	20.900	21.000	21.100
D1	16.250	16.550	16.850
D2	1.052	1.202	1.352
E	15.700	15.800	15.900
E1	13.060	13.260	13.460
E2	4.900	5.000	5.100
E3	2.400	2.500	2.600
e	5.440 BSC		
F	6.000	6.200	6.400
L	19.750	19.950	20.150
L1	-	-	4.300
Φ	3.500	3.600	3.700
Φ1	-	-	7.400
Φ2	2.400	2.500	2.600
Q	5.600	5.800	6.000
S	6.180 BSC		
T	9.800	10.000	10.200
θ	8° REF		
θ1	15° REF		
θ2	8° REF		

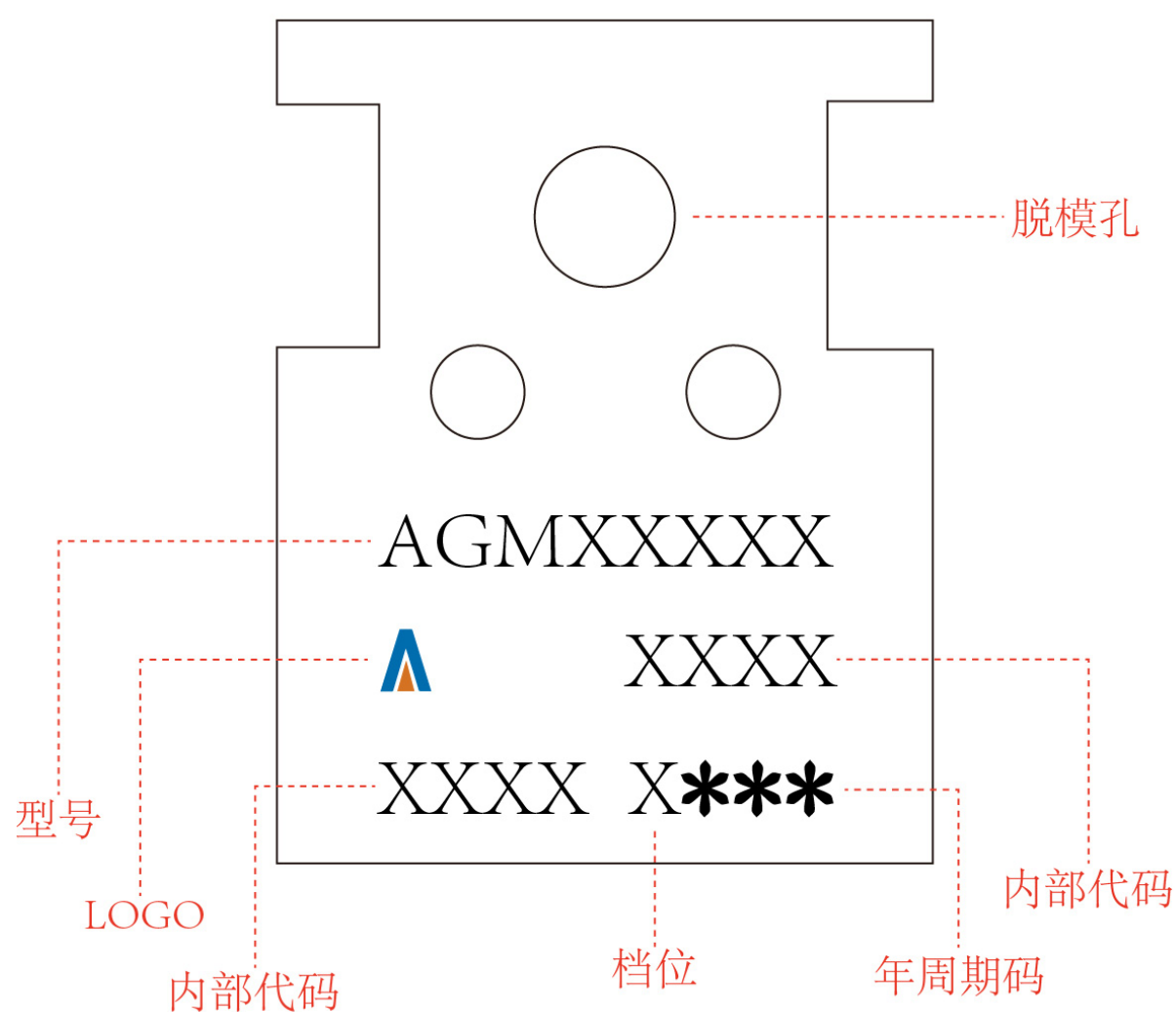


DIM.	MIN.	NOM.	MAX.
A	4.90	5.00	5.10
A1	2.25	2.36	2.51
A2	1.90	2.00	2.10
b	1.16	1.20	1.26
b1	1.96	2.00	2.06
b2	2.96	3.00	3.06
b3	-	-	2.25
b4	-	-	3.25
c	0.59	0.60	0.66
D	20.90	21.00	21.10
D1	16.25	16.55	16.85
D2	1.05	1.17	1.35
E	15.70	15.80	15.90
E1	13.10	13.26	13.50
E2	4.40	4.50	4.60
E3	2.40	2.50	2.60
e	5.436BSC		
L	19.80	19.90	20.10
L1	-	-	4.30
M	0.35	0.89	0.95
P	3.40	3.50	3.60
P1	7.00	7.20	7.40
P2	2.40	2.50	2.60
Q	5.60	5.80	6.00
S	6.05	6.15	6.25
T	9.80	10.00	10.20
U	6.00	6.20	6.40

All dimensions in millimeters

TO-247

Marking Instructions:




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