

● General Description

The AGM65N20AT 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

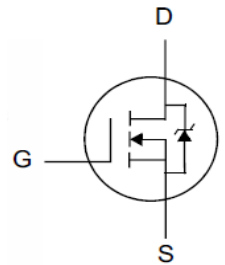
● Application

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

Product Summary

BVDSS	RDSON	ID
200V	17mΩ	75A

TO-247 Pin Configuration



Package Marking and Ordering Information

Device Marking	Device	Device Package	Reel Size	Tape width	Quantity
AGM65N20AT	AGM65N20AT	TO-247	---	---	450

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

Symbol	Parameter	Value	Unit
VDS	Drain-Source Voltage (VGS=0V)	200	V
VGS	Gate-Source Voltage (VDS=0V)	±30	V
ID	Drain Current-Continuous(Tc=25°C) (Note 1)	75	A
	Drain Current-Continuous(Tc=100°C)	52	A
IDM (pluse)	Drain Current-Continuous@ 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)	300	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 (TC=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=25V, ID=40A	50	65	--	S
RDS(on)	Drain-Source On-State Resistance	VGS=10V, ID=40A	--	17	20	mΩ
		VGS=4.5V, ID=40A	--	--	--	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=30A , VDD=50V dI/dt=100A/μs , TJ=25°C	--	110	--	ns
Qrr	Reverse Recovery Charge		--	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: TJ=25°C

Test Circuits and Waveforms

Figure A: Gate Charge Test Circuit and Waveform

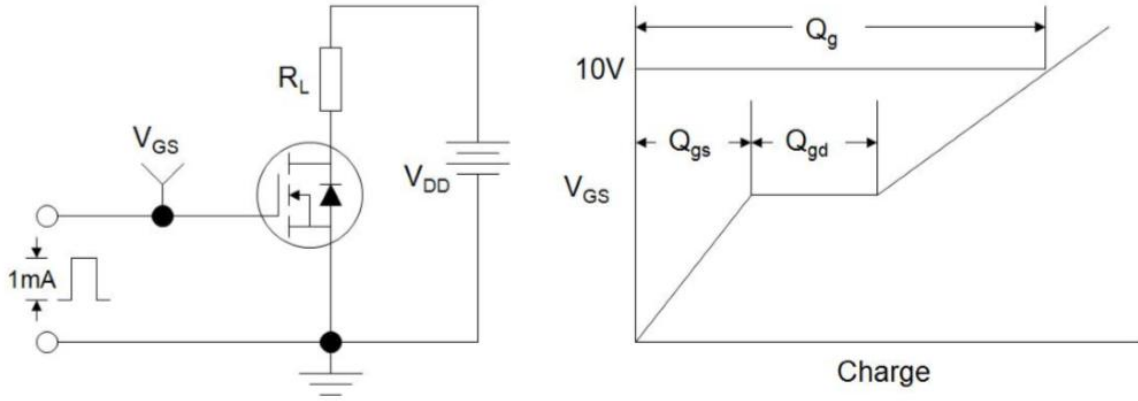


Figure B: Resistive Switching Test Circuit and Waveform

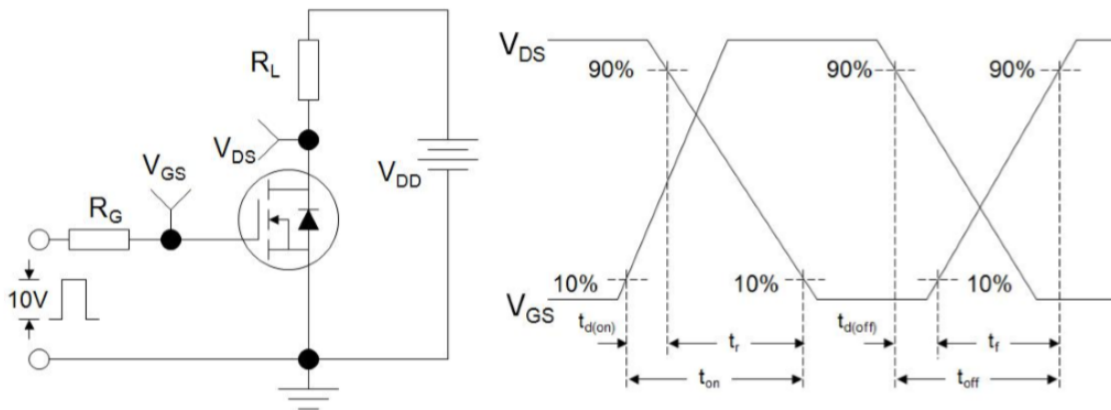
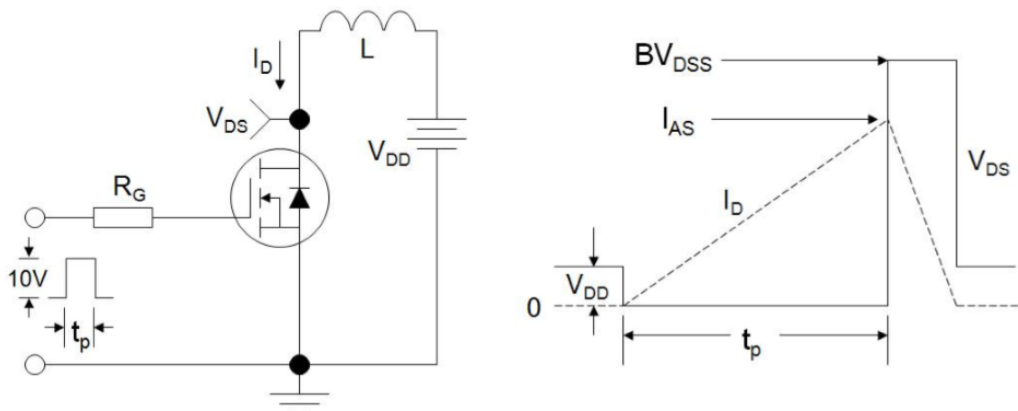


Figure C: Unclamped Inductive Switching Test Circuit and Waveform



Characteristics Curve:

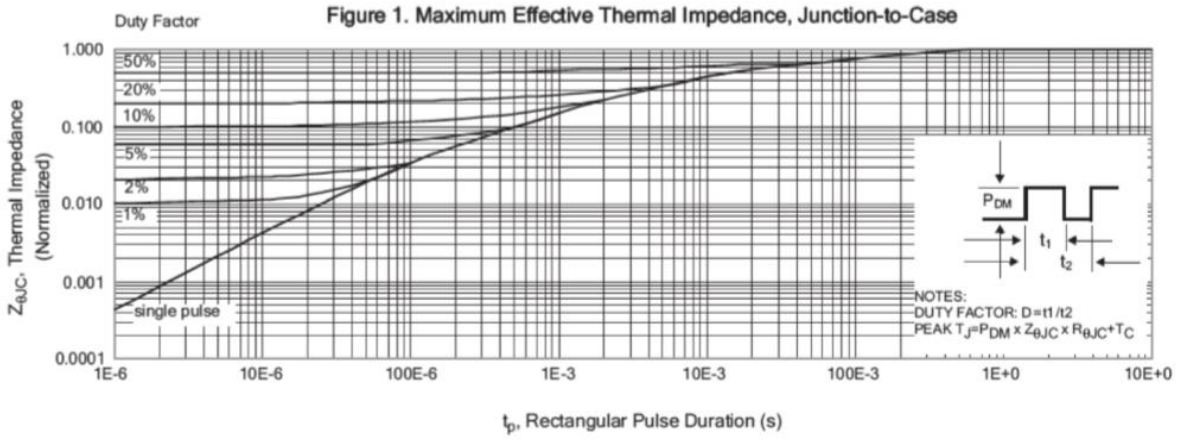


Figure 2 . Max. Power Dissipation vs Case Temperature

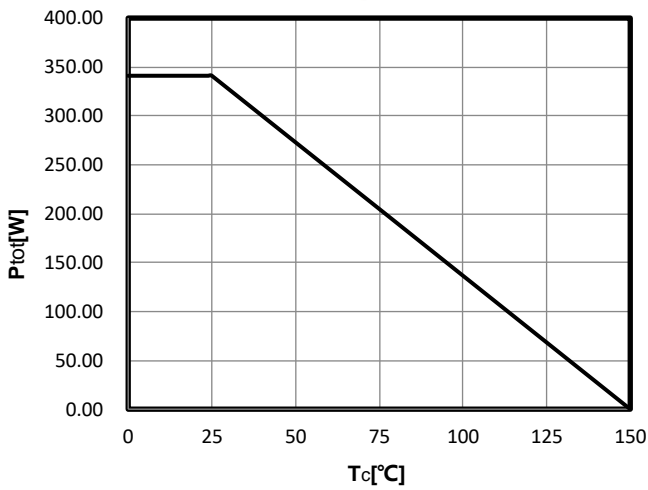


Figure 3 .Maximum Continuous Drain Current vs Tc

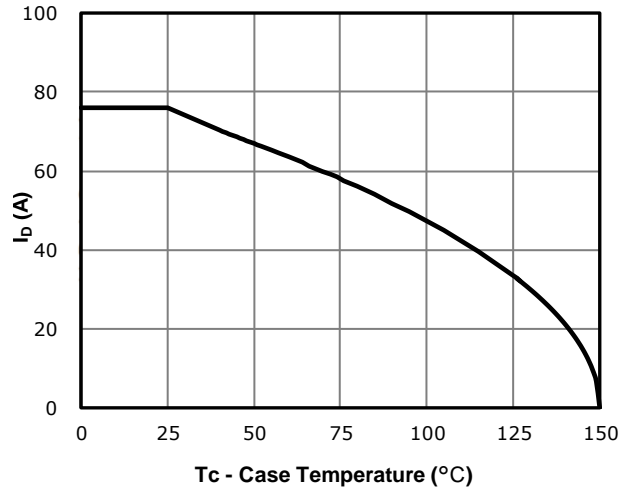


Figure 4. Typical Output Characteristics

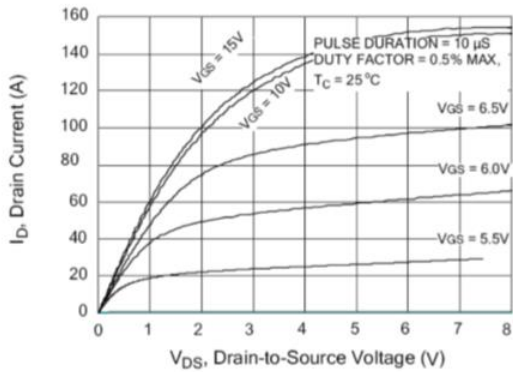


Figure 5. Typical Drain-to-Source ON Resistance vs Gate Voltage and Drain Current

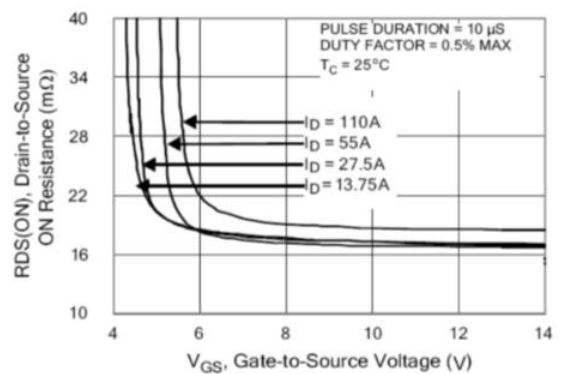


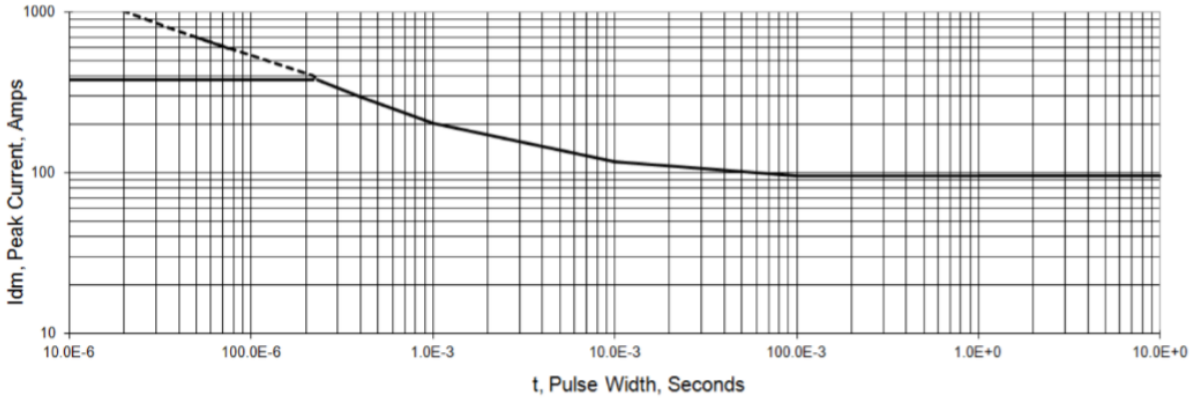
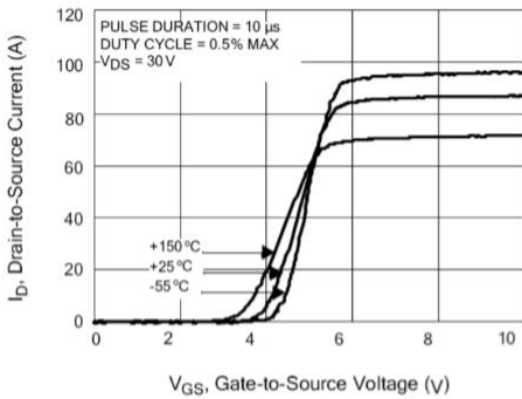
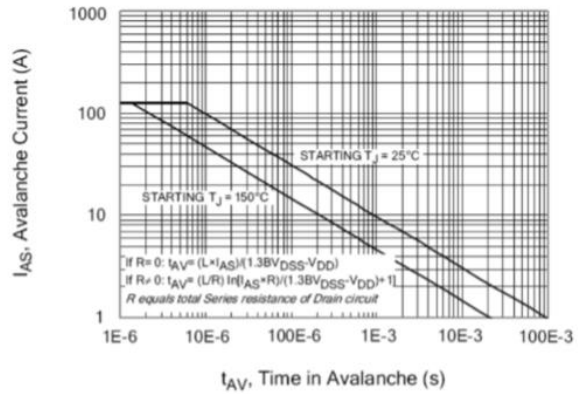
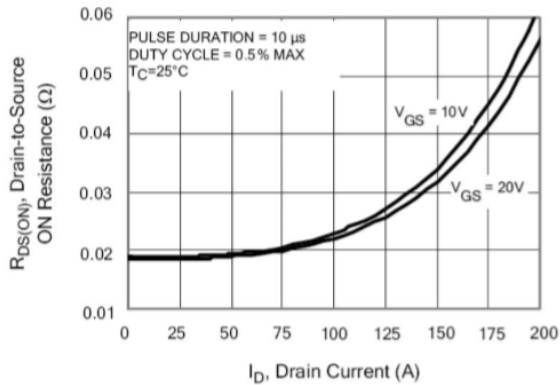
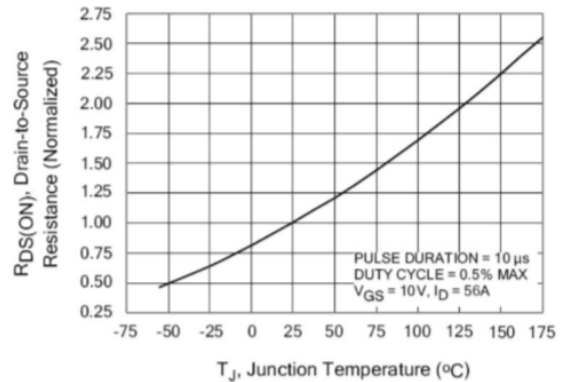
Figure 6. Peak Current Capability

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

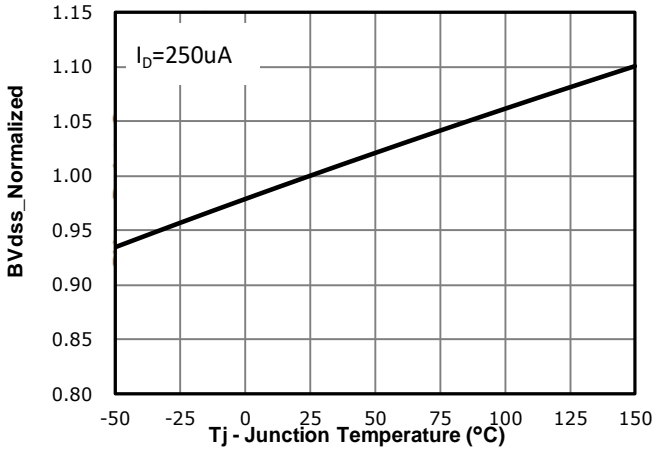


Figure 12. Typical Threshold Voltage vs Junction Temperature

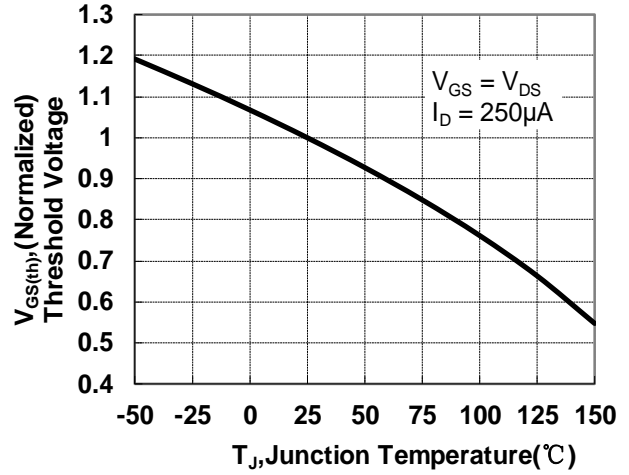


Figure 13. Maximum Safe Operating Area

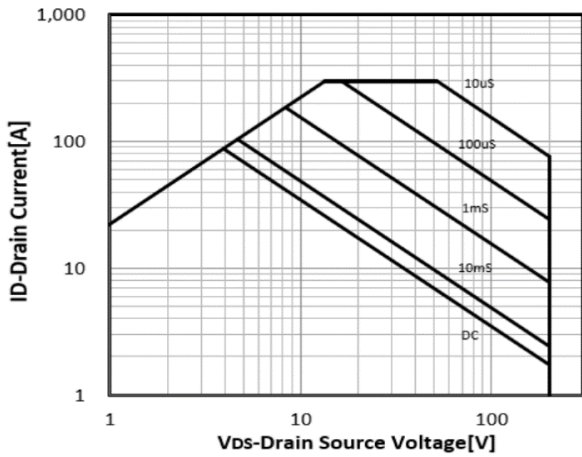


Figure 14. Capacitance vs Vds

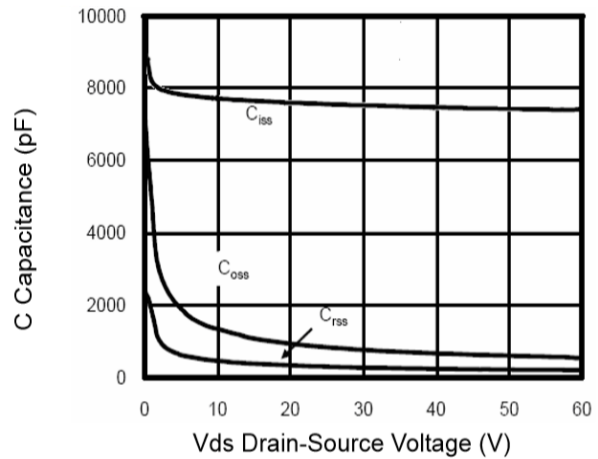


Figure 15. Typical Gate Charge

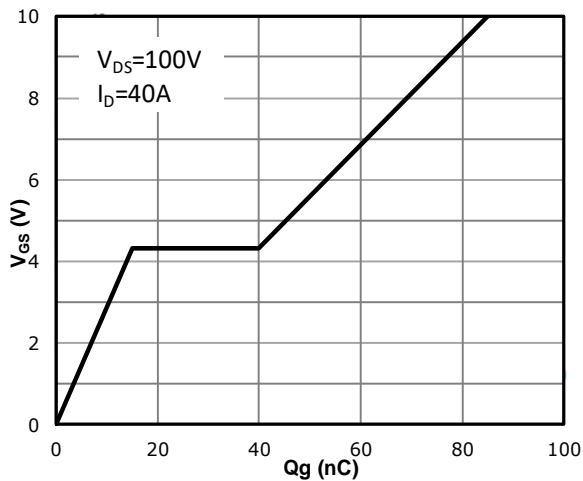
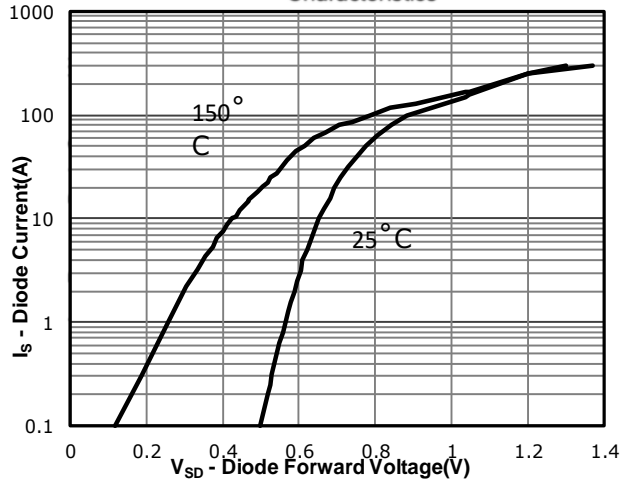
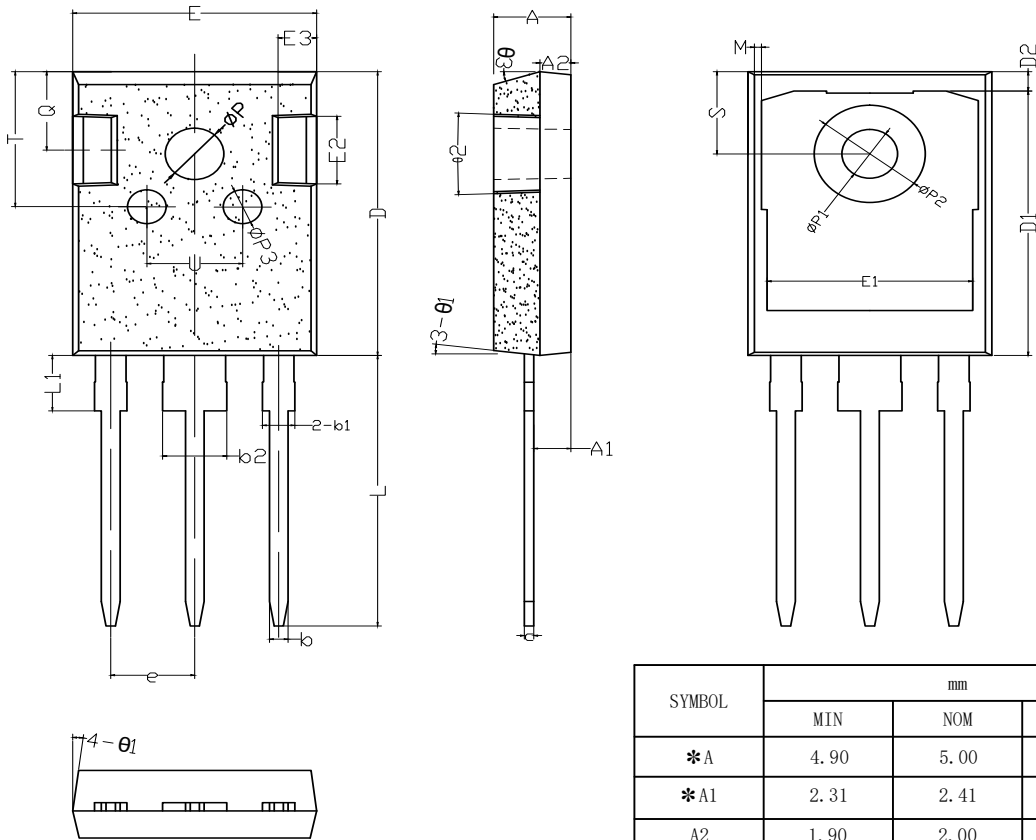


Figure 16. Typical Body Diode Transfer Characteristics



TO-247 Package Information:


SYMBOL	mm		
	MIN	NOM	MAX
*A	4.90	5.00	5.10
*A1	2.31	2.41	2.51
A2	1.90	2.00	2.10
*b	1.15	1.20	1.25
*b1	1.95	2.10	2.25
*b2	2.95	3.10	3.25
*c	0.55	0.60	0.65
*D	20.90	21.00	21.10
D1	16.35	16.55	16.75
D2	1.05	1.20	1.35
*E	15.70	15.80	15.90
E1	13.10	13.25	13.40
E2	4.90	5.00	5.10
E3	2.40	2.50	2.60
*e	5.40	5.44	5.48
*L	19.80	19.92	20.10
*L1	-	-	4.30
* ΦP	3.70	3.80	3.90
* $\Phi P1$	3.50	3.60	3.70
$\Phi P2$	7.00	7.20	7.40
$\Phi P3$	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
$\theta1$	5°	7°	9°
$\theta2$	1°	3°	5°
$\theta3$	13°	15°	17°


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