

MOSFET Silicon N-Channel MOS



1. Applications

Synchronous rectification in SMPS,
Hard switching and High speed circuit
DC/DC in telecoms and industrial

2. Features

Low drain-source on-resistance: $R_{DS(ON)} = 2.9m\Omega$ (typ.)
High speed power switching
Enhanced body diode dv/dt capability
Enhanced avalanche ruggedness

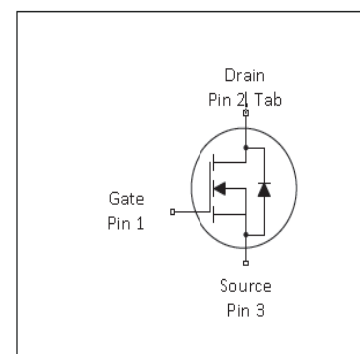


Table 1 Key Performance Parameters

Parameter	Value	Unit
$V_{DS} @ T_{j,max}$	85	V
$R_{DS(on),max}$	3.3	m Ω
$Q_{g,typ}$	109	nC
$I_{D,pulse}$	640	A

3. Packaging and Internal Circuit

Part Name	Package	Marking
AUB033N08BG	TO263	AUB033N08BG
AUP033N08BG	TO220	AUP033N08BG
AUW033N08BG	TO247	AUW033N08BG



1 Maximum ratings

at $T_j = 25^\circ\text{C}$, unless otherwise specified

Table 2 Maximum ratings

Parameter	Symbol	Values			Unit	Note / Test Condition
		Min.	Typ.	Max.		
Continuous drain current ¹⁾	I_D		-	160 115	A	$T_C = 25^\circ\text{C}$ $T_C = 100^\circ\text{C}$
Pulsed drain current ²⁾	$I_{D,pulse}$	-		640	A	$T_C = 25^\circ\text{C}$
Avalanche energy, single pulse	E_{AS}	-	-	884	mJ	
Gate source voltage (static)	V_{GS}	-20	-	20	V	static;
Power dissipation(TO220)	P_{tot}	-	-	370	W	$T_C = 25^\circ\text{C}$
Power dissipation(TO263)	P_{tot}	-	-	179	W	$T_C = 25^\circ\text{C}$
Power dissipation(TO247)	P_{tot}	-	-	340	W	$T_C = 25^\circ\text{C}$
Storage temperature	T_{stg}	-55	-	175	$^\circ\text{C}$	
Operating junction temperature	T_j	-55	-	175	$^\circ\text{C}$	

¹⁾ Limited by $T_{j,max}$. Maximum Duty Cycle $D = 0.50$

²⁾ Pulse width t_p limited by $T_{j,max}$

³⁾ Identical low side and high side switch with identical R_G

2 Thermal characteristics

Table 3 Thermal characteristics(TO220)

Parameter	Symbol	Values			Unit	Note / Test Condition
		Min.	Typ.	Max.		
Thermal resistance, junction - case	R_{thJC}	-	-	0.42	°C/W	-
Thermal resistance, junction - ambient	R_{thJA}	-	-	62	°C/W	device on PCB, minimal footprint

Thermal characteristics (TO263)

Parameter	Symbol	Values			Unit	Note / Test Condition
		Min.	Typ.	Max.		
Thermal resistance, junction - case	R_{thJC}	-	-	0.7	°C/W	-
Thermal resistance, junction - ambient	R_{thJA}	-	-	62	°C/W	device on PCB, minimal footprint

Thermal characteristics (TO247)

Parameter	Symbol	Values			Unit	Note / Test Condition
		Min.	Typ.	Max.		
Thermal resistance, junction - case	R_{thJC}	-	-	0.44	°C/W	-
Thermal resistance, junction - ambient	R_{thJA}	-	-	40	°C/W	device on PCB, minimal footprint

3 Electrical characteristics

at $T_j=25^{\circ}\text{C}$, unless otherwise specified

Table 4 Static characteristics

Parameter	Symbol	Values			Unit	Note / Test Condition
		Min.	Typ.	Max.		
Drain-source breakdown voltage	$V_{(BR)DSS}$	85	-	-	V	$V_{GS}=0V, I_D=10mA$
Gate threshold voltage	$V_{(GS)th}$	2.5		3.5	V	$V_{DS}=V_{GS}, I_D=250\mu A$
Zero gate voltage drain current	I_{DSS}	-	-	1000	nA	$V_{DS}=80V, V_{GS}=0V, T_j=25^{\circ}\text{C}$
Gate-source leakage current	I_{GSS}	-	-	100	nA	$V_{GS}=20V, V_{DS}=0V$
Drain-source on-state resistance	$R_{DS(on)}$	-	2.9	3.3	m Ω	$V_{GS}=10V, I_D=20A, T_j=25^{\circ}\text{C}$
Gate resistance (Intrinsic)	R_G	-	0.7	-	Ω	$f=1MHz, \text{open drain}$

Table 5 Dynamic characteristics

Parameter	Symbol	Values			Unit	Note / Test Condition
		Min.	Typ.	Max.		
Input capacitance	C_{iss}	-	7463	-	pF	$V_{DS}=40V, V_{GS}=0V$ $f=1MHz$
Output capacitance	C_{oss}	-	1292	-	pF	$V_{DS}=40V, V_{GS}=0V$ $f=1MHz$
Reverse transfer capacitance	C_{rss}	-	43.4	-	pF	$V_{DS}=40V, V_{GS}=0V$ $f=1MHz$
Turn-on delay time	$t_{d(on)}$	-	24	-	ns	$V_{DD}=40V, V_{GS}=10V, R_G=10\Omega$ $I_D=20A$
Rise time	t_r	-	53	-	ns	$V_{DD}=40V, V_{GS}=10V, R_G=10\Omega$ $I_D=20A$
Turn-off delay time	$t_{d(off)}$	-	107	-	ns	$V_{DD}=40V, V_{GS}=10V, R_G=10\Omega$ $I_D=20A$
Fall time	t_f	-	66	-	ns	$V_{DD}=40V, V_{GS}=10V, R_G=10\Omega$ $I_D=20A$

Table 6 Gate charge characteristics

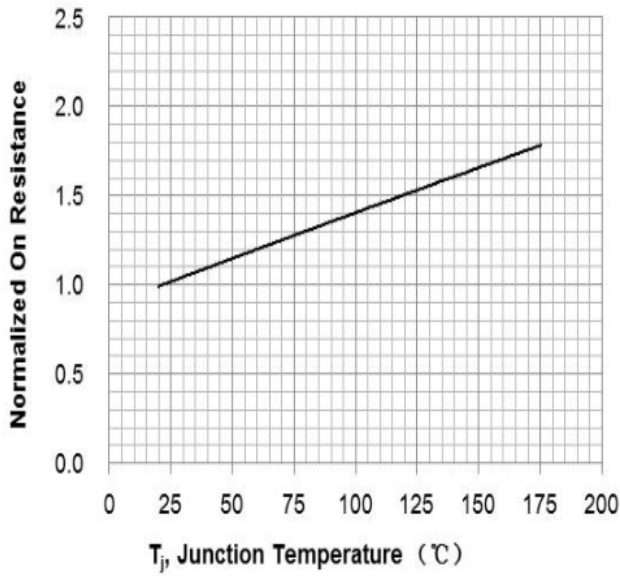
Parameter	Symbol	Values			Unit	Note / Test Condition
		Min.	Typ.	Max.		
Gate to source charge	Q_{gs}	-	27.5	-	nC	$V_{DS}=40V, V_{GS}=0 \text{ to } 10V$ $I_D=20A$
Gate to drain charge	Q_{gd}	-	26.4	-	nC	$V_{DS}=40V, V_{GS}=0 \text{ to } 10V$ $I_D=20A$
Gate charge total	Q_g	-	109	-	nC	$V_{DS}=40V, V_{GS}=0 \text{ to } 10V$ $I_D=20A$

Table 7 Reverse diode characteristics

Parameter	Symbol	Values			Unit	Note / Test Condition
		Min.	Typ.	Max.		
Diode forward voltage	V_{SD}	-	0.67	-	V	$V_{GS}=0V, I_F=1A, T_J=25^{\circ}C$
Reverse recovery time	t_{rr}	-	52	-	ns	$V_R=40V, I_F=20A, diF/dt=200A/us$
Reverse recovery charge	Q_{rr}	-	137	-	uC	$V_R=40V, I_F=20A, diF/dt=200A/us$
Peak reverse recovery current	I_{rrm}	-	-3.7	-	A	$V_R=40V, I_F=20A, diF/dt=200A/us$

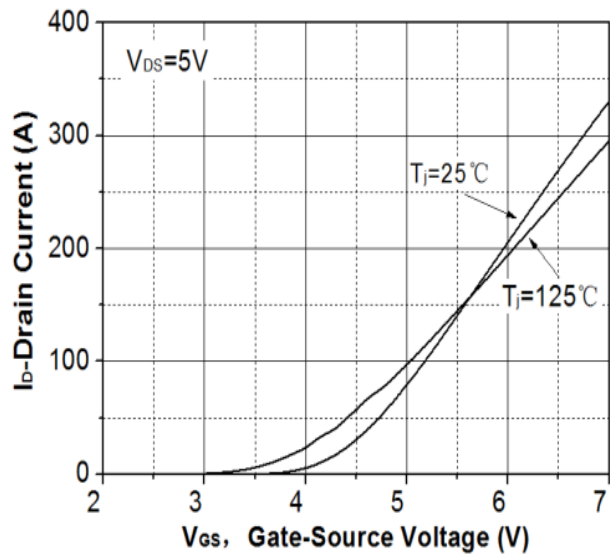
Electrical characteristics diagram

Diagram 1: Drain-Source on-state resistance



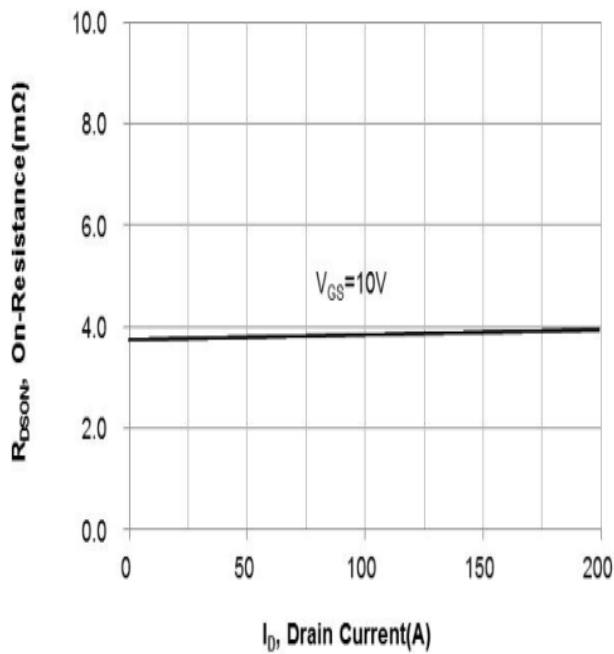
$R_{DS(on)}=f(T_j)$; $I_D=20\text{ A}$; $V_{GS}=10\text{ V}$

Diagram 2: Typ. transfer characteristics



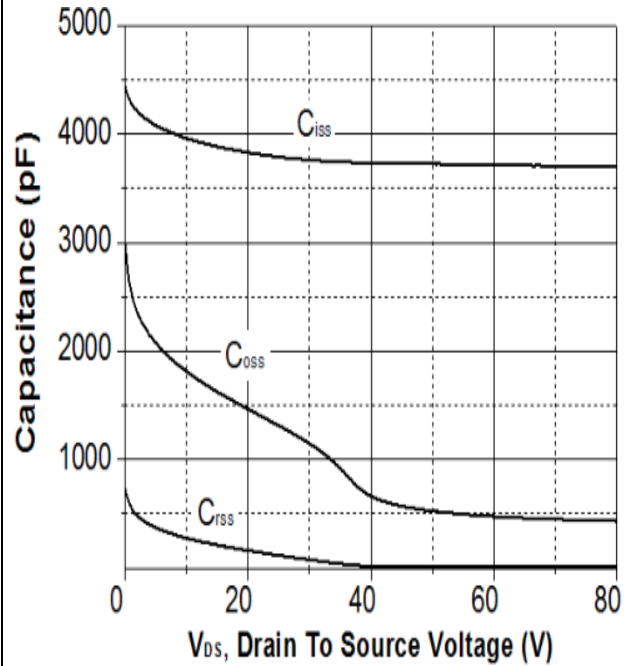
$I_D=f(V_{GS})$; $V_{DS}=5\text{ V}$; parameter: T_j

Diagram 3: Drain-Source on-state resistance



$R_{DS(on)}=f(I_D)$; parameter: V_{GS}

Diagram 4: Typ. Capacitances



$C=f(V_{DS})$; $V_{GS}=0\text{ V}$; $f=1\text{ MHz}$

4 Package Outlines

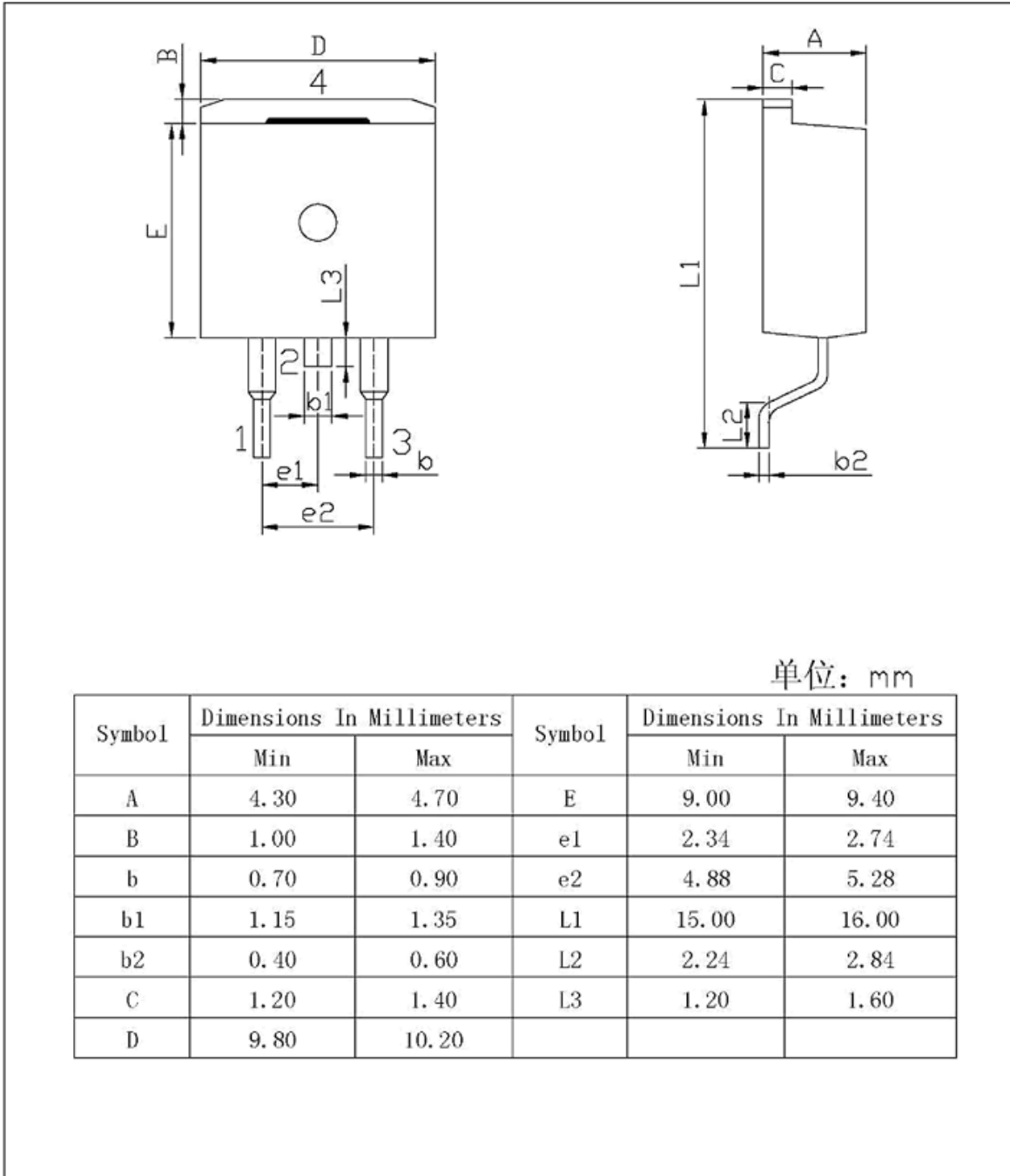


Figure1: Outline PG-T0263

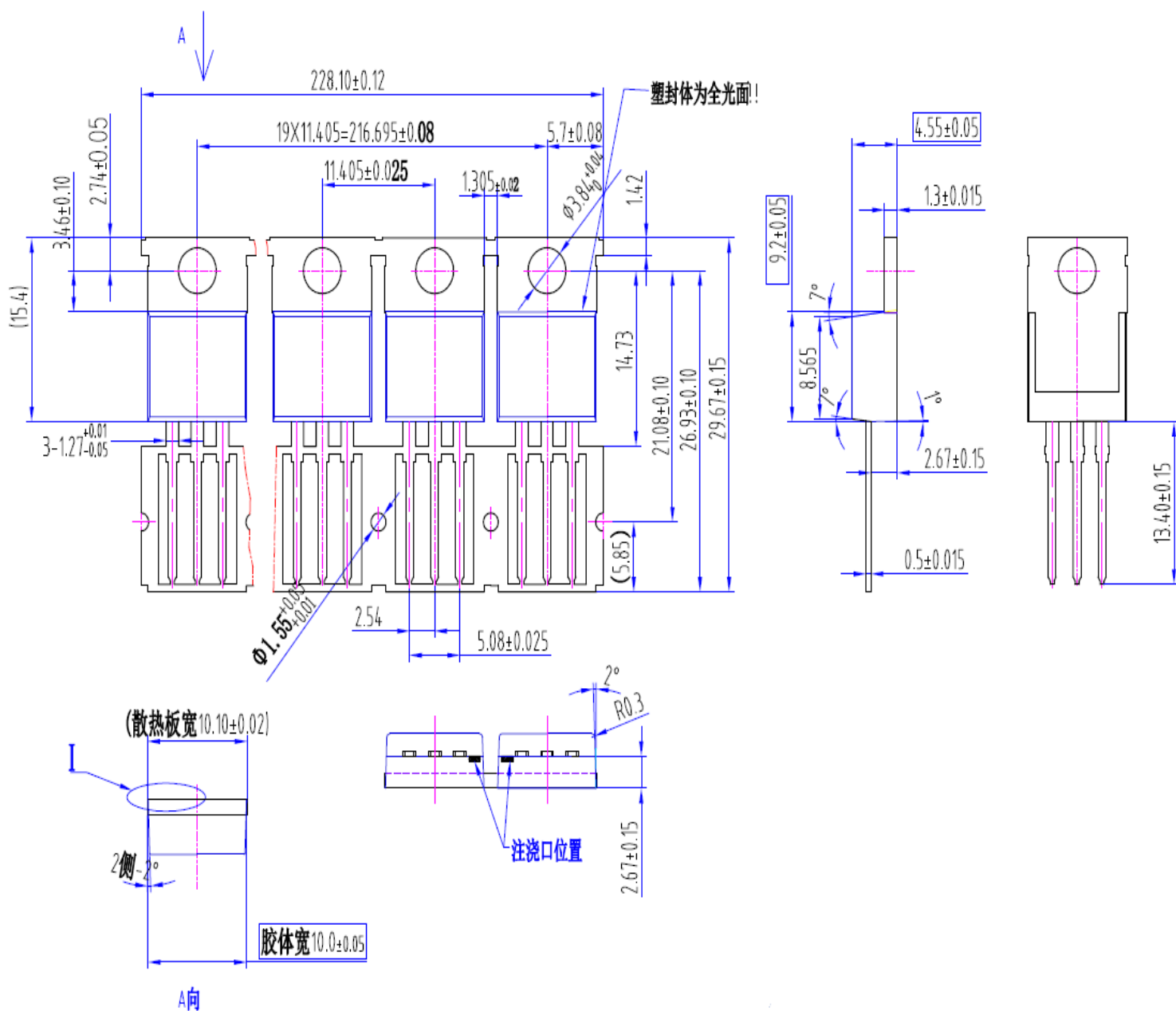


Figure2: Outline PG-T0220

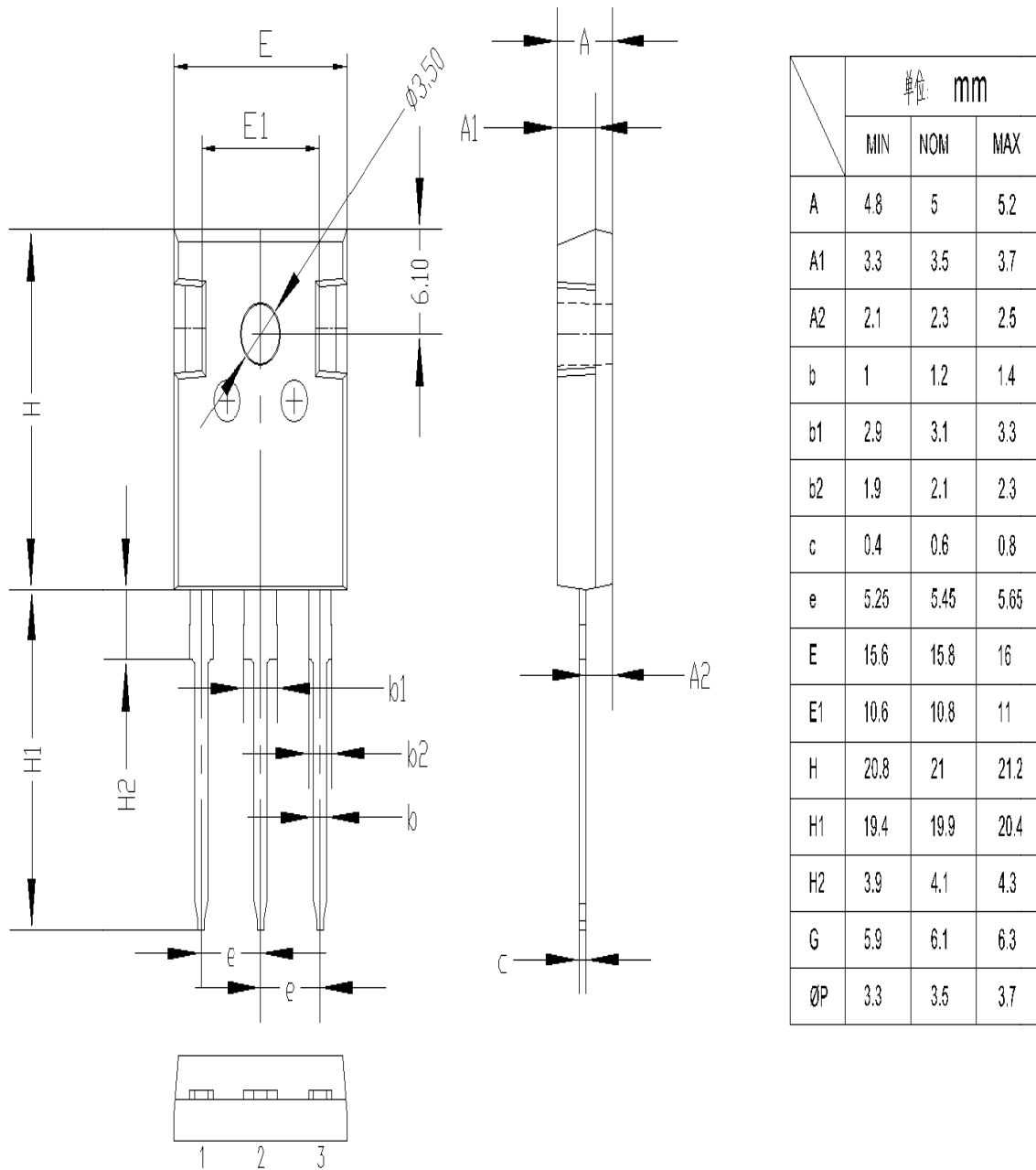


Figure3: Outline PG-T0247

Revision History

Revision	Date	Subjects (major changes since last revision)
1.0	2021-06-1	Preliminary version

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