AUA060N08AG, AUB060N08AG, AUP060N08AG, AUN060N08AG, AUD060N08AG

MOSFET Silicon N-Channel MOS

1. Applications

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

2. Features

Low drain-source on-resistance: RDS(ON) = 5.6mΩ (typ.)
High speed power switching
Enhanced body diode dv/dt capability
Enhanced avalanche ruggedness

Table 1   Key Performance Parameters

Parameter	Value	Unit
V_{DS} @ $T_{j,max}$	80	V
$R_{DS(on),max}$	6.0	mΩ
$Q_{g,typ}$	55.7	nC
$I_{D,pulse}$	240	A

3. Packaging and Internal Circuit

Part Name	Package	Marking
AUA060N08AG	TO220F	AUA060N08AG
AUB060N08AG	TO263	AUB060N08AG
AUP060N08AG	TO220	AUP060N08AG
AUN060N08AG	DFN5x6	AUN060N08AG
AUD060N08AG	TO252	AUD060N08AG

TO220F	TO263	TO220	TO252	DFN5x6
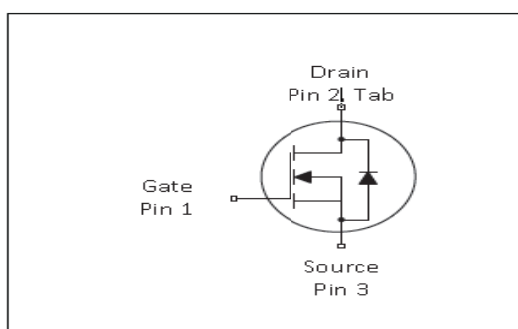
1 Maximum ratings

At T_j= 25°C, unless otherwise specified

Table 2 Maximum ratings

Parameter	Symbol	Values			Unit	Note / Test Condition
		Min.	Typ.	Max.		
Continuous drain current[1]	I_D		-	60	A	T_C=25°C
Pulsed drain current[2]	$I_{D,pulse}$	-		240	A	T_C=25°C
Avalanche energy, single pulse	E_{AS}	-	-	300	mJ	
Gate source voltage (static)	V_{GS}	-20	-	20	V	static;
Power dissipation (TO220F)	P_{tot}	-	-	30	W	T_C=25°C
Power dissipation (TO263&TO220&TO252)	P_{tot}	-	-	150	W	T_C=25°C
Power dissipation (DFN5x6)	P_{tot}	-	-	74	W	T_C=25°C
Storage temperature	T_{stg}	-55	-	175	°C	
Operating junction temperature	T_j	-55	-	175	°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(TO220F)

Parameter	Symbol	Values			Unit	Note / Test Condition
		Min.	Typ.	Max.		
Thermal resistance, junction - case	R_{thJC}	-	-	5	°C/W	-
Thermal resistance, junction - ambient	R_{thJA}	-	-	60	°C/W	device on PCB, minimal footprint

Table   Thermal characteristics(TO263&TO220&TO252)

Parameter	Symbol	Values			Unit	Note / Test Condition
		Min.	Typ.	Max.		
Thermal resistance, junction - case	R_{thJC}	-	-	1	°C/W	-
Thermal resistance, junction - ambient	R_{thJA}	-	-	62	°C/W	device on PCB, minimal footprint

Table   Thermal characteristics(DFN5x6)

Parameter	Symbol	Values			Unit	Note / Test Condition
		Min.	Typ.	Max.		
Thermal resistance, junction - case	R_{thJC}	-	-	1.7	°C/W	-
Thermal resistance, junction - ambient	R_{thJA}	-	-	50	°C/W	device on PCB, minimal footprint

3   Electrical characteristics

at T_j=25°C, unless otherwise specified

Table 4   Static characteristics

Parameter	Symbol	Values			Unit	Note / Test Condition
		Min.	Typ.	Max.		
Drain-source breakdown voltage	$V_{(BR)DSS}$	80	-	-	V	V_{GS}=0V, I_D=10mA
Gate threshold voltage	$V_{(GS)th}$	2.5		3.4	V	V_{DS}= V_{GS}, I_D=250uA
Zero gate voltage drain current	I_{DSS}	-	-	1000	nA	V_{DS}=80V, V_{GS}=0V, T_j=25°C
Gate-source leakage current	I_{GSS}	-	-	100	nA	V_{GS}=20V, V_{DS}=0V
Drain-source on-state resistance	$R_{DS(on)}$	-	5.4	6.0	mΩ	V_{GS}=10V, I_D=20A, T_j=25°C
Gate resistance (Intrinsic)	R_G	-	1.2	-	Ω	f=1MHz, open drain

Table 5   Dynamic characteristics

Parameter	Symbol	Values			Unit	Note / Test Condition
		Min.	Typ.	Max.		
Input capacitance	C_{iss}	-	3730	-	pF	Vds=40V,Vgs=0V f=1MHz
Output capacitance	C_{oss}	-	674	-	pF	Vds=40V,Vgs=0V f=1MHz
Reverse transfer capacitance	C_{rss}	-	24.24	-	pF	Vds=40V,Vgs=0V f=1MHz
Turn-on delay time	$t_{d(on)}$	-	16.5	-	ns	VDD=40V,VGS=10V,RG=10Ω ID=20A
Rise time	t_r	-	13.7	-	ns	VDD=40V,VGS=10V,RG=10Ω ID=20A
Turn-off delay time	$t_{d(off)}$	-	35.9	-	ns	VDD=40V,VGS=10V,RG=10Ω ID=20A
Fall time	t_f	-	13.45	-	ns	VDD=40V,VGS=10V,RG=10Ω ID=20A

Table 6   Gate charge characteristics

Parameter	Symbol	Values			Unit	Note / Test Condition
		Min.	Typ.	Max.		
Gate to source charge	Q_{gs}	-	15.9	-	nC	VDS=40V,VGS=0 to 10V ID=20A
Gate to drain charge	Q_{gd}	-	13.3	-	nC	VDS=40V,VGS=0 to 10V ID=20A
Gate charge total	Q_g	-	55.7	-	nC	VDS=40V,VGS=0 to 10V ID=20A

Table 7   Reverse diode characteristics

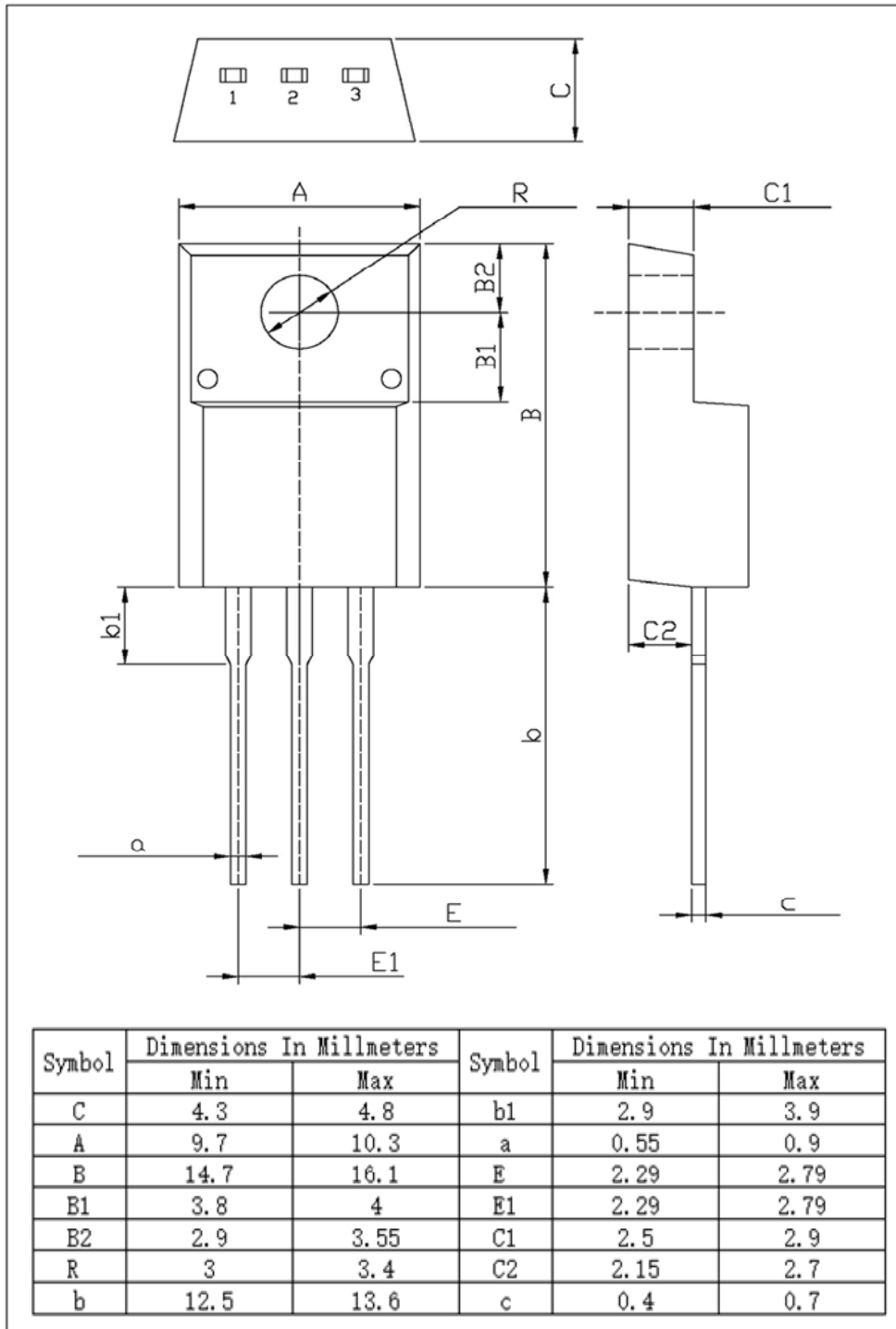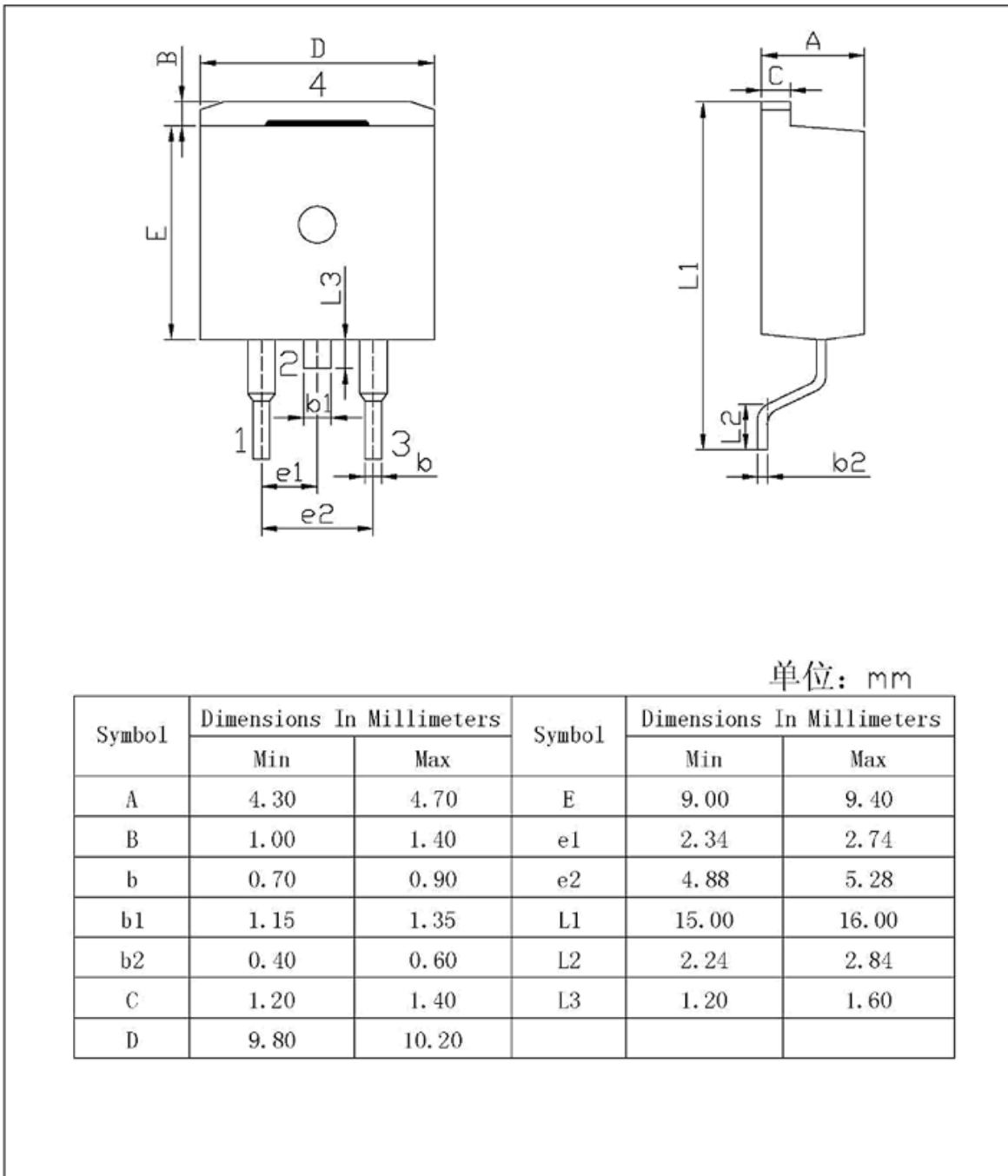| Parameter	Symbol	Values			Unit	Note / Test Condition
		Min.	Typ.	Max.		
Diode forward voltage	V_{SD}	-	0.7	-	V	V_{GS}=0V, I_F=1A, T_j=25°C
Reverse recovery time	t_{rr}	-	40.9	-	ns	VR=40V,IF=20A, diF/dt=200A/us
Reverse recovery charge	Q_{rr}	-	106.8	-	uC	VR=40V,IF=20A,diF/dt=200A/us
Peak reverse recovery current	I_{rrm}	-	-3.7	-	A	VR=40V,IF=20A,diF/dt=200A/us

4 Package Outlines

Figure1：Outline PG-TO220F

Symbol	Dimensions In Millmeters		Symbol	Dimensions In Millmeters	
	Min	Max		Min	Max
C	4.3	4.8	b1	2.9	3.9
A	9.7	10.3	a	0.55	0.9
B	14.7	16.1	E	2.29	2.79
B1	3.8	4	E1	2.29	2.79
B2	2.9	3.55	C1	2.5	2.9
R	3	3.4	C2	2.15	2.7
b	12.5	13.6	c	0.4	0.7

单位：mm

Symbol	Dimensions In Millimeters		Symbol	Dimensions In Millimeters	
	Min	Max		Min	Max
A	4.30	4.70	E	9.00	9.40
B	1.00	1.40	e1	2.34	2.74
b	0.70	0.90	e2	4.88	5.28
b1	1.15	1.35	L1	15.00	16.00
b2	0.40	0.60	L2	2.24	2.84
C	1.20	1.40	L3	1.20	1.60
D	9.80	10.20			

Figure2：Outline PG-TO263

Figure3：Outline PG-TO220
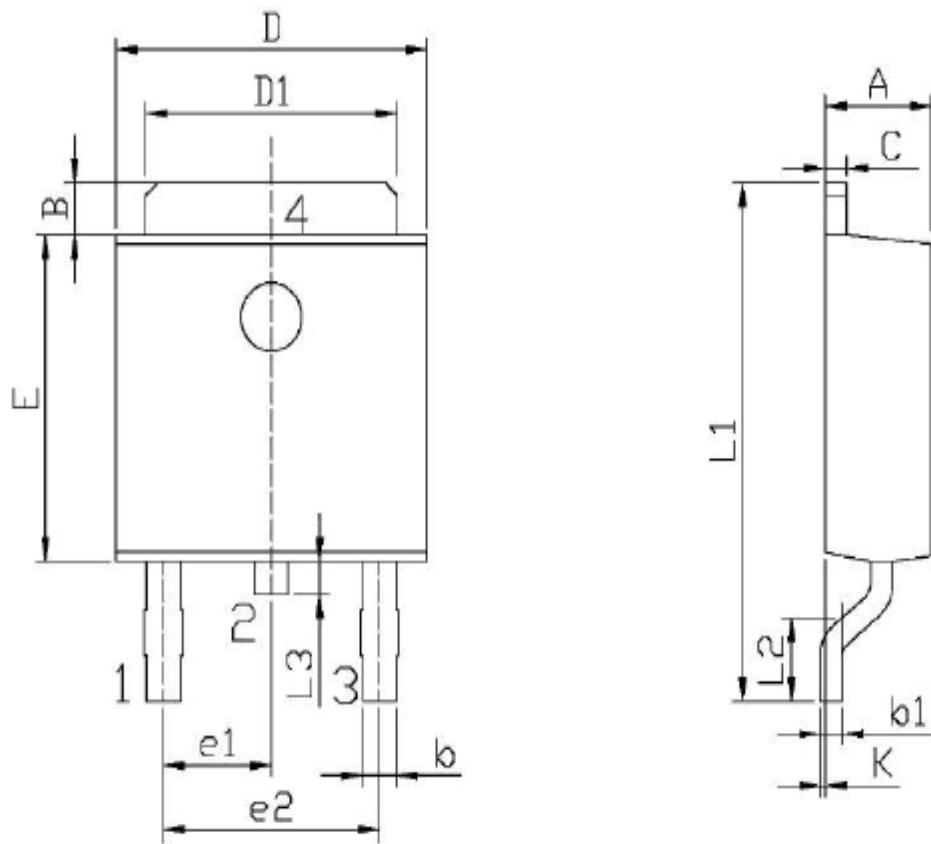
单位：mm

Symbol	Dimensions In Millimeters		Symbol	Dimensions In Millimeters	
	Min	Max		Min	Max
A	2.20	2.40	E	5.95	6.25
B	0.95	1.25	e1	2.24	2.34
b	0.50	0.70	e2	4.43	4.73
b1	0.45	0.55	L1	9.45	9.95
C	0.45	0.55	L2	1.25	1.75
D	6.45	6.75	L3	0.60	0.90
D1	5.10	5.50	K	0.00	0.10

Figure4：OutlinePG-TO252
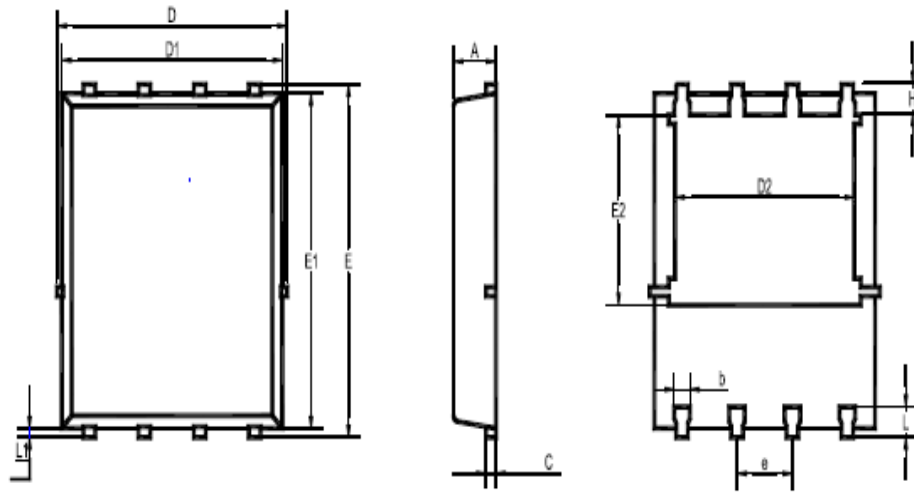
UNIT	A	b	C	D	D1	D2	E	E1	E2	e	L	L1	H
mm	1.12	0.51	0.34	5.26	5.1	4.5	6.25	6	3.66	1.37	0.71	0.2	0.71
	0.9	0.33	0.11	4.7	4.7	3.56	5.75	5.6	3.18	1.17	0.35	0.06	0.35

Recommended Soldering Footprint
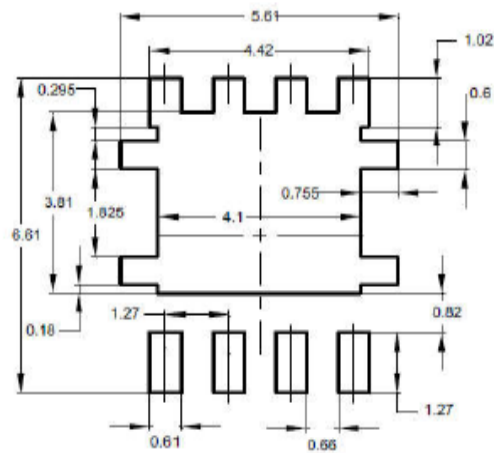
Figure5：Outline PG-DFN5x6

Revision History

Revision	Date	Subjects (major changes since last revision)
1.0	2021-01-21	Preliminary version
1.1	2021-02-04	Add package for TO263&TO220&DFN5x6&TO252