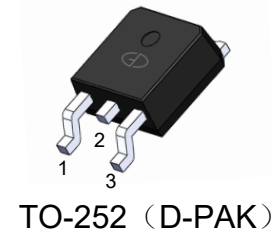


## N-Channel 100V (D-S) Power MOSFET

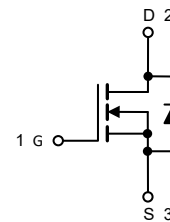
### Features

- 100% Avalanche Tested
- Extremely Low Losses with Low FOM  $R_{ds(on)} \cdot Q_g$
- RoHS Compliant, Halogen Free, Pb-Free
- AEC-Q101 Qualified
- MSL 1



### Applications

- Automotive systems
- Motors, lamps and solenoid control
- Ultra high performance power switching



### Absolute Maximum Ratings ( $T_J=25^\circ\text{C}$ unless otherwise noted)

Parameter	Symbol	Value	Unit
Drain Source Voltage	$V_{DS}$	100	V
Gate Source Voltage	$V_{GS}$	$\pm 20$	V
Drain Current, Continuous $V_{GS}=10\text{V}$	$I_D$	$T_C=25^\circ\text{C}$	79
		$T_C=100^\circ\text{C}$	56
Drain Current, Pulsed (Note 1)	$I_{DM}$	316	A
Single Avalanche Energy (Note 2)	$E_{AS}$	30	mJ
Power Dissipation	$P_D$	$T_C=25^\circ\text{C}$	150
		$T_C=100^\circ\text{C}$	75
Operating Junction and Storage Temperature Range	$T_J/T_{STG}$	-55 to +175	$^\circ\text{C}$

Note 1: Single pulse;  $t_p \leq 1\mu\text{s}$ .

Note 2:  $V_{DD} = 20\text{V}$ ,  $V_{GS} = 10\text{V}$ ,  $L = 0.5\text{mH}$ ,  $R_G = 25\Omega$ , starting  $T_J = 25^\circ\text{C}$ .

### Thermal Characteristics

Parameter	Symbol	Max.	Unit
Thermal Resistance Junction to Case	$R_{thJC}$	1	$^\circ\text{C/W}$
Thermal Resistance Junction to Ambient (Note 3)	$R_{thJA}$	62.5	$^\circ\text{C/W}$

Note 3: Device mounted on 1 square inch FR4 PCB board, with 2oz single-sided copper, in a  $25^\circ\text{C}$  still air environment.

### Electrical Characteristics (T<sub>J</sub> =25°C unless otherwise noted)

Parameter	Symbol	Test Conditions	Min.	Typ.	Max.	Unit
Drain Source Breakdown Voltage	V <sub>(BR)DSS</sub>	V <sub>GS</sub> =0V, I <sub>D</sub> =250μA	100	--	--	V
Zero Gate Voltage Drain Current	I <sub>DSS</sub>	V <sub>DS</sub> =100V, V <sub>GS</sub> =0V	--	--	1	uA
Gate Threshold Voltage	V <sub>GS(TH)</sub>	V <sub>DS</sub> =V <sub>GS</sub> , I <sub>DS</sub> =250uA	1.4	1.8	2.2	V
Gate Leakage Current	I <sub>GSS</sub>	V <sub>GS</sub> =±20V, V <sub>DS</sub> =0V	--	--	±100	nA
Drain-Source On-state Resistance (Note 4)	R <sub>DS(on)</sub>	V <sub>GS</sub> =10V, I <sub>D</sub> =20A	--	9.5	12	mΩ
		V <sub>GS</sub> =4.5V, I <sub>D</sub> =10A	--	11	14	mΩ
Total Gate Charge	Q <sub>g</sub>	V <sub>GS(off)</sub> =0V, V <sub>GS(on)</sub> =10V, V <sub>DD</sub> =50V, I <sub>D</sub> =20A	--	20	--	nC
Gate Source Charge	Q <sub>gs</sub>		--	2.7	--	
Gate Drain Charge	Q <sub>gd</sub>		--	7	--	
Turn-on Delay Time	t <sub>d(on)</sub>	V <sub>GS</sub> =10V, V <sub>DD</sub> =50V, R <sub>L</sub> =0.75Ω, R <sub>G</sub> =3Ω	--	9.9	--	ns
Turn-on Rise Time	t <sub>r</sub>		--	7	--	
Turn-off Delay Time	t <sub>d(off)</sub>		--	25	--	
Turn-off Fall Time	t <sub>f</sub>		--	10	--	
Gate Resistance	R <sub>g</sub>	V <sub>GS</sub> =0V, f=1MHz, open drain	--	1.6	--	Ω
Input Capacitance	C <sub>iss</sub>	V <sub>GS</sub> =0V, V <sub>DS</sub> =100V, f=1MHz	--	1125	--	pF
Output Capacitance	C <sub>oss</sub>		--	169	--	
Reverse Transfer Capacitance	C <sub>rss</sub>		--	3.6	--	

### Reverse Diode Characteristics (T<sub>J</sub> =25°C unless otherwise noted)

Parameter	Symbol	Test Conditions	Min.	Typ.	Max.	Unit
Forward Current, Continuous	I <sub>SD</sub>	T <sub>C</sub> =25°C	--	--	79	A
Diode Forward Voltage (Note 4)	V <sub>SD</sub>	I <sub>F</sub> =20A, V <sub>GS</sub> =0V	--	--	1.2	V
Reverse Recovery Time	T <sub>rr</sub>	V <sub>R</sub> =50V, I <sub>F</sub> =520A, di/dt=100A/μs	--	46	--	ns
Reverse Recovery Charge	Q <sub>rr</sub>		--	49	--	nC

Note 4: Pulse test; pulse width ≤ 380μs, duty cycle ≤ 1%.

## Typical Characteristics Curves (T<sub>J</sub> = 25°C unless otherwise noted)

Fig. 1 - Output Characteristics

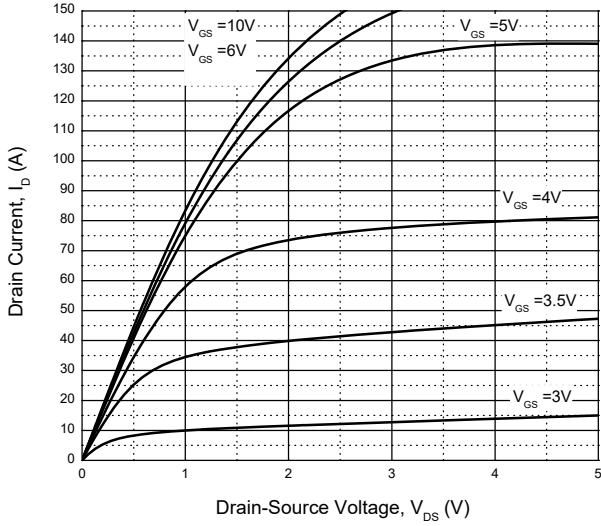


Fig. 2 - Transfer Characteristics

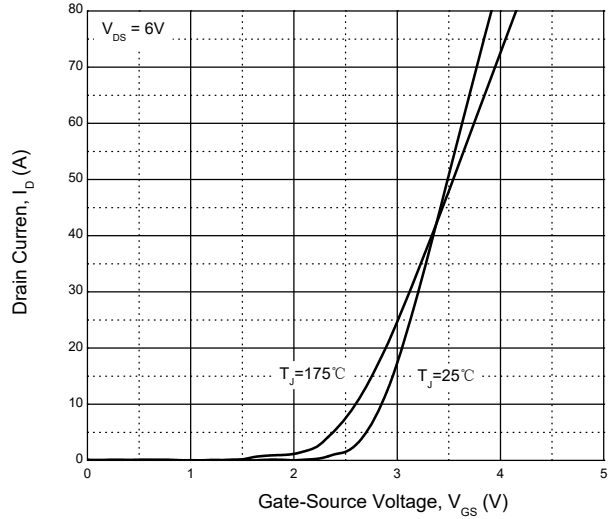


Fig. 3 - Drain-Source On-Resistance

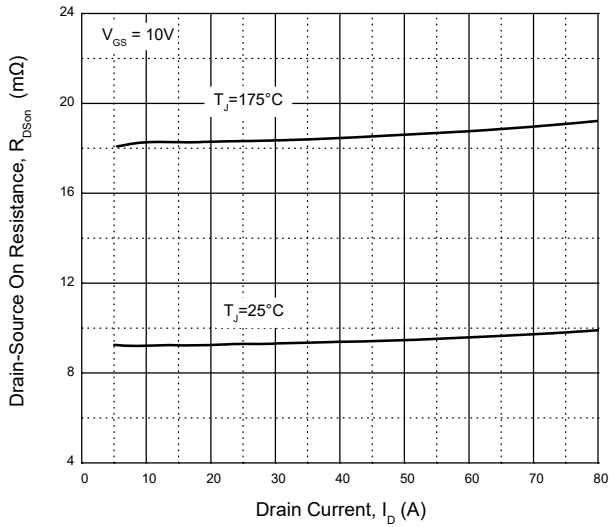


Fig. 4 - Normalized On-Resistance

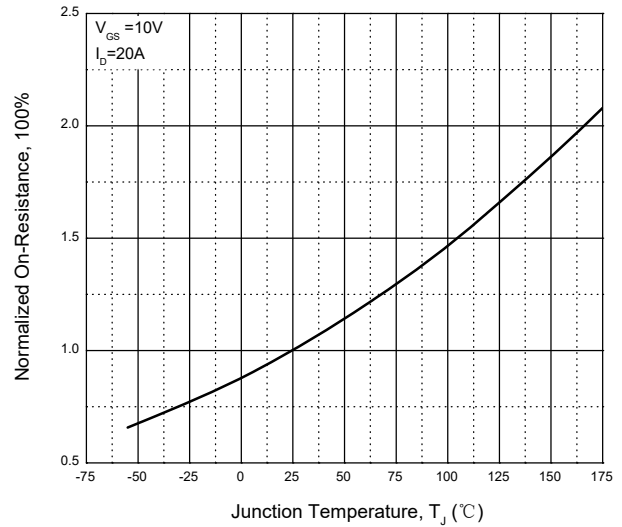


Fig. 5 - Drain-Source On-Resistance

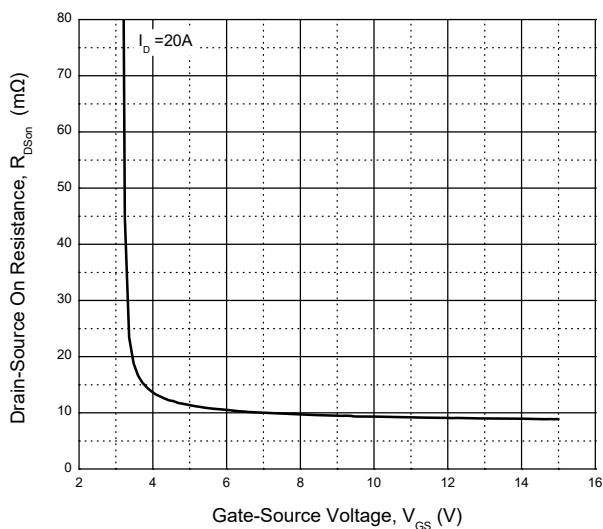
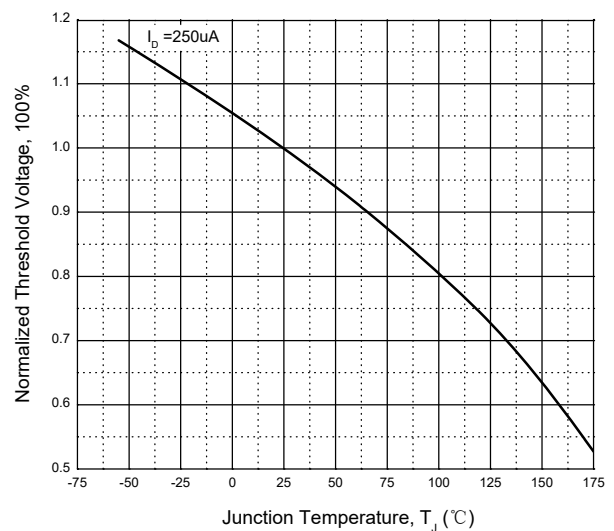


Fig. 6 - Normalized Threshold Voltage



## Typical Characteristics Curves (T<sub>J</sub> = 25°C unless otherwise noted)

Fig. 7 - Capacitance

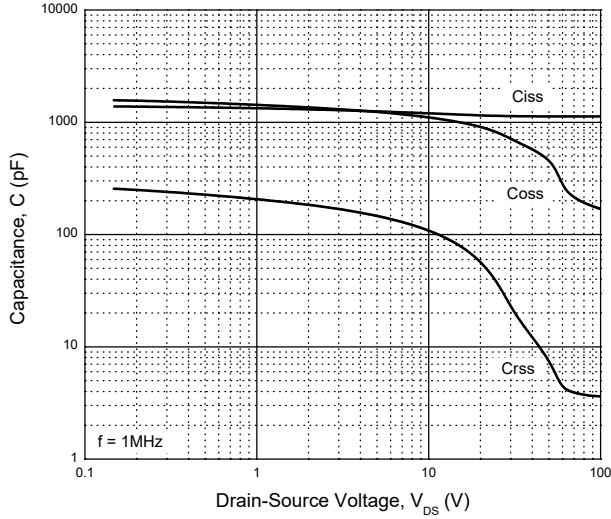


Fig. 8 - Gate Charge

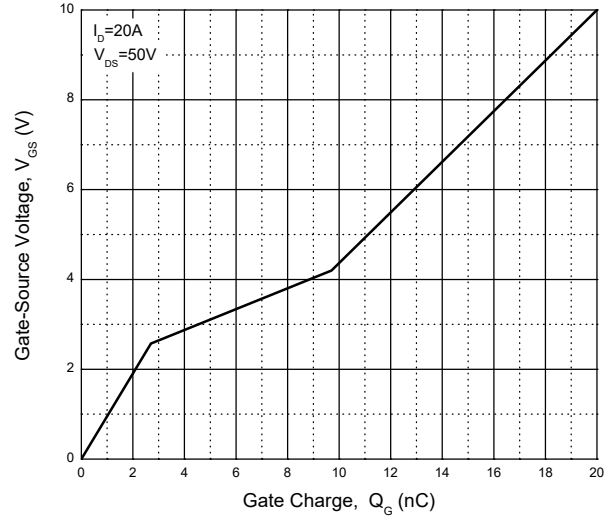


Fig. 9 - Forward Characteristic

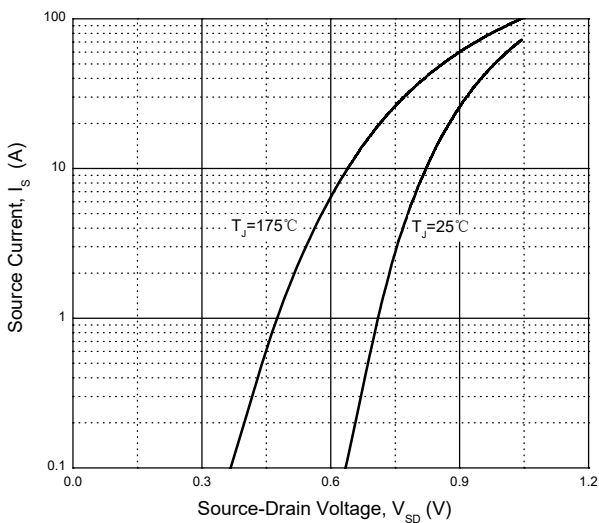


Fig. 10 - Safe Operating Area

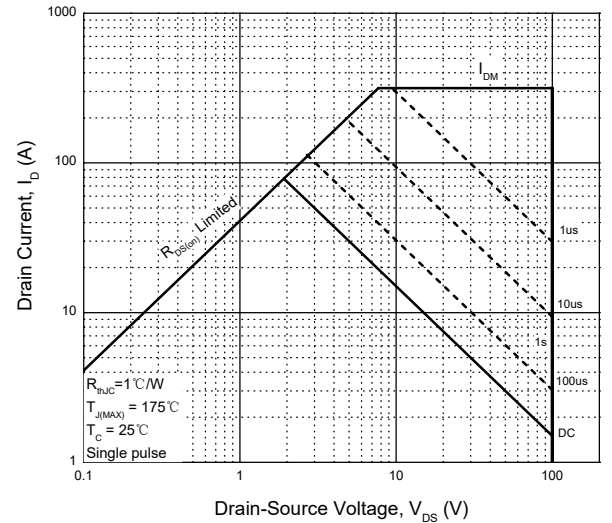
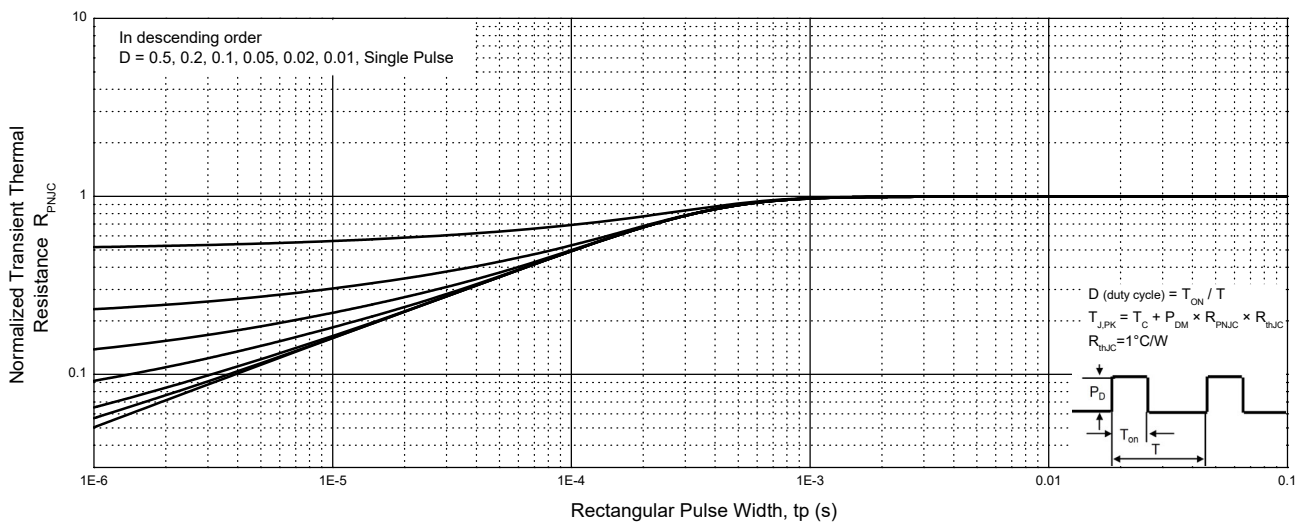


Fig.11 - Normalized Thermal Impedance, Junction-Case



## Typical Characteristics Curves (T<sub>J</sub> = 25°C unless otherwise noted)

Fig. 12 - Power Derating

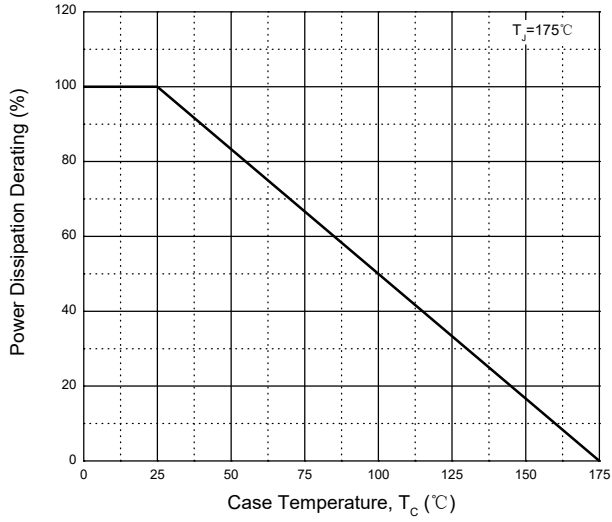
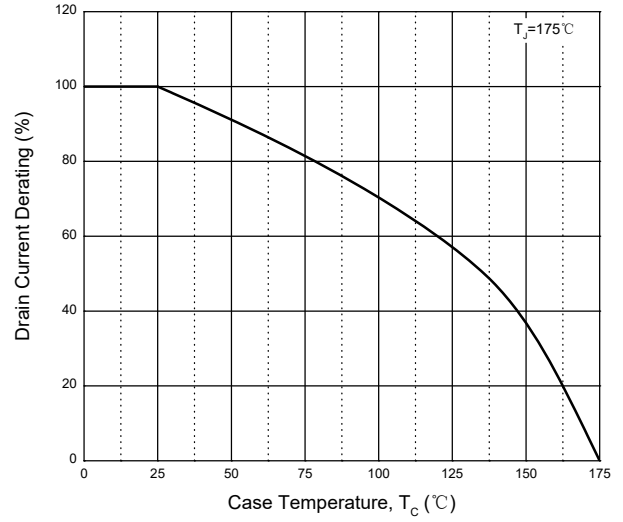
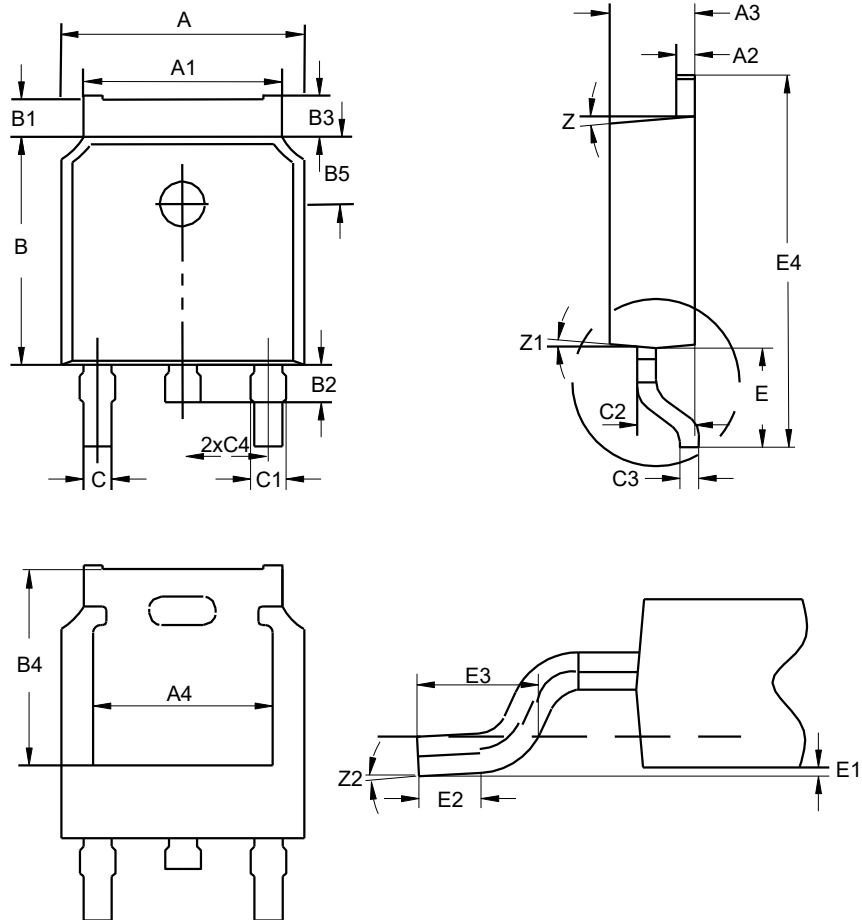


Fig. 13 - Drain Current Derating



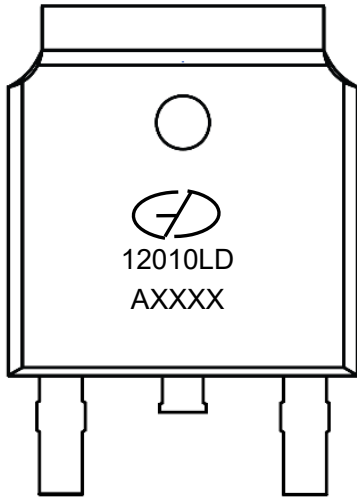
## Package Outline Dimensions (Unit: millimeters)

### TO-252(D-PAK)




TO-252							
	Min.	Nom.	Max.		Min.	Nom.	Max.
A	6.34	6.54	6.74	C1	0.75	0.95	1.15
A1	5.2	5.3	5.4	C2	1.34	1.54	1.74
A2	0.4	0.5	0.6	C3	0.4	0.5	0.6
A3	2.08	2.28	2.48	C4	2.09	2.29	2.49
A4	-	4.8	-	E	2.6	2.9	3.2
B	5.8	6.1	6.4	E1	0	-	0.15
B1	0.82	1.02	1.22	E2	0.7	-	-
B2	0.8	1	1.2	E3	1.3	1.6	1.9
B3	0.9	1.1	1.3	E4	9.8	10.1	10.4
B4	-	5.25	-	Z	-	7°	-
B5	7.83	8.03	8.23	Z1	-	7°	-
C	0.66	0.76	0.86	Z2	0°	-	10°

**Marking Outline**



Part Name: AGMN12010LD

1. Logo Mark: 
2. P/N Mark: 12010LD
3. Date Code: AXXXX

**Revision History**

Version	Date	Major Changes
Rev.A	2024.12.13	Official Release

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