

MAIN CHARACTERISTICS

I_D	280A
V_{DSS}	40V
$R_{DS(on)-typ}$ (@ $V_{GS}=10V$ $T_c=25^\circ C$)	0.91m Ω

FEATURES

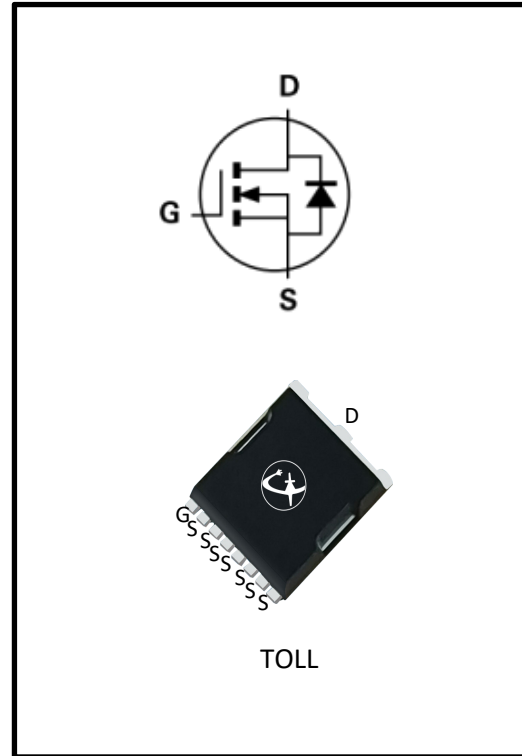
- Low $R_{DS(on)}$ trench technology
- Low thermal impedance
- Fast switching speed

APPLICATIONS

- DC/DC conversion
- Power switch
- Motor drives

MECHANICAL DATA

- Case: Molded plastic
- Mounting Position: Any
- Molded Plastic: UL Flammability Classification Rating 94V-0
- Lead free in compliance with EU RoHS 2011/65/EU directive
- Solder bath temperature 275 $^\circ C$ maximum, 10s per JESD 22-B106



Product specification classification

Part Number	Package	Mode Name	Pack
LG280N04AL	TOLL	LG280N04AL	Tape

Maximum Ratings at Tc=25°C unless otherwise specified

Parameter	Symbol	Value	Unit
Drain-Source Voltage	V_{DS}	40	V
Gate-Source Voltage	V_{GS}	± 20	V
Continue Drain Current	I_D	280	A
Pulsed Drain Current (Note1)	I_{DM}	1120	A
Power Dissipation	P_D	175	W
Single Pulse Avalanche Energy (Note1)	E_{AS}	580	mJ
Operating Temperature Range	T_J	150	°C
Storage Temperature Range	T_{STG}	-55 to +150	°C
Thermal Resistance, Junction to Case	$R_{\theta JC}$	0.7	°C/W
Thermal Resistance, Junction to Ambient	$R_{\theta JA}$	40	°C/W

Note1:Pulse test: 300 μ s pulse width, 2 % duty cycle

Electrical Characteristics at Tc=25°C unless otherwise specified

Parameter	Test Condition	Symbol	Min	Typ	Max	Unit
Drain-Source Breakdown Voltage	$V_{GS} = 0 \text{ V}, I_D = 250 \mu\text{A}$	BV_{DSS}	40	-	-	V
Drain-Source Leakage Current	$V_{DS} = 40 \text{ V}, V_{GS} = 0 \text{ V}$	I_{DSS}	-	-	1	μA
Gate Leakage Current	$V_{GS} = \pm 20 \text{ V}, V_{DS} = 0 \text{ V}$	I_{GSS}	-	-	± 100	nA
Gate-Source Threshold Voltage	$V_{DS} = V_{GS}, I_D = 250 \mu\text{A}$	$V_{GS(th)}$	1	-	2.2	V
Drain-Source On-State Resistance	$V_{GS}=10\text{V}, I_D=90\text{A}$	$R_{DS(on)}$	-	0.91	1.1	m Ω
	$V_{GS}=4.5\text{V}, I_D=45\text{A}$		-	1.25	1.65	m Ω
Input Capacitance	$V_{DS}=20\text{V}, V_{GS}=0\text{V}, f=1\text{MHz}$	C_{iss}	-	5900	-	pF
Output Capacitance		C_{oss}	-	1670	-	pF
Reverse Transfer Capacitance		C_{rss}	-	165	-	pF
Turn-on Delay Time(Note2)	$V_{DD}=20\text{V}, V_{GS}=10\text{V}, R_G=4.7\Omega, I_D=90\text{A}$	$t_{d(ON)}$	-	26	-	ns
Rise Time(Note2)		t_r	-	106	-	ns
Turn-Off Delay Time(Note2)		$t_{d(OFF)}$	-	111	-	ns
Fall Time(Note2)		t_f	-	41	-	ns
Total Gate Charge(Note2)	$V_{DS}=20\text{V}, V_{GS}=10\text{V}, I_D=90\text{A}$	Q_G	-	88	-	nC
Gate to Source Charge(Note2)		Q_{GS}	-	20	-	nC
Gate to Drain Charge(Note2)		Q_{GD}	-	17	-	nC

Source-Drain Diode Characteristics at Ta=25°C unless otherwise specified

Parameter	Test Condition	Symbol	Min.	Typ.	Max.	Unit
Maximun Body-Diode Continuous Current		I_S	-	-	280	A
Maximun Body-Diode Pulsed Current(Note2)		I_{SM}	-	-	1120	A
Drain-Source Diode Forward Voltage	$V_{GS}=0\text{V}, I_S=90\text{A}, T_J=25^\circ\text{C}$	V_{SD}	-	-	1.1	V
Reverse Recovery Time	$I_S = I_F, I_{SD}=90\text{A}, V_{GS} = 0 \text{ V},$	t_{rr}	-	66	-	ns
Reverse Recovery Charge	$dI / dt = 100 \text{ A}/\mu\text{s}$ (Note3)	Q_{rr}	-	63	-	nC

Note2:Pulse test: 300 μ s pulse width, 2 % duty cycle

RATINGS AND CHARACTERISTIC CURVES

Fig.1 Typ. transfer characteristics

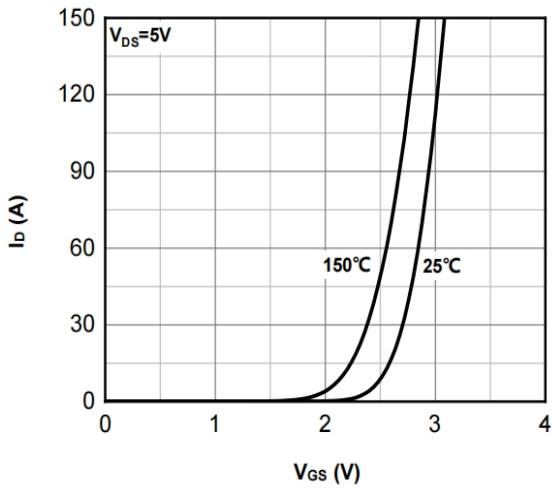


Fig.2 Typ. output characteristics

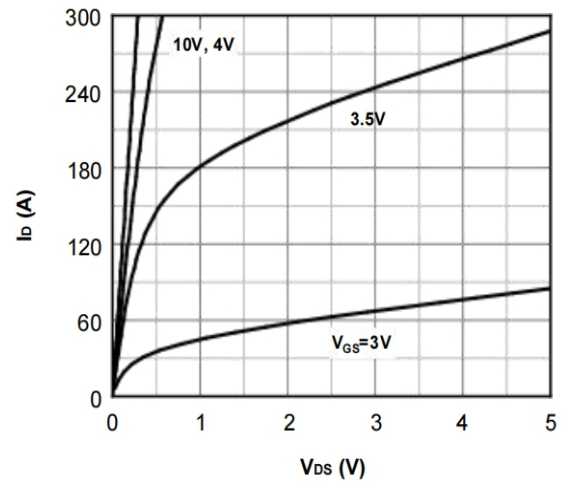


Fig.3 Normalized on-resistance vs drain current

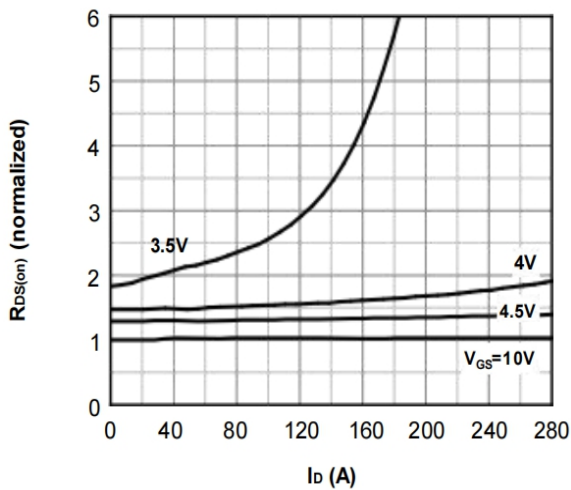


Fig.4 Typ. on-resistance vs gate-source voltage

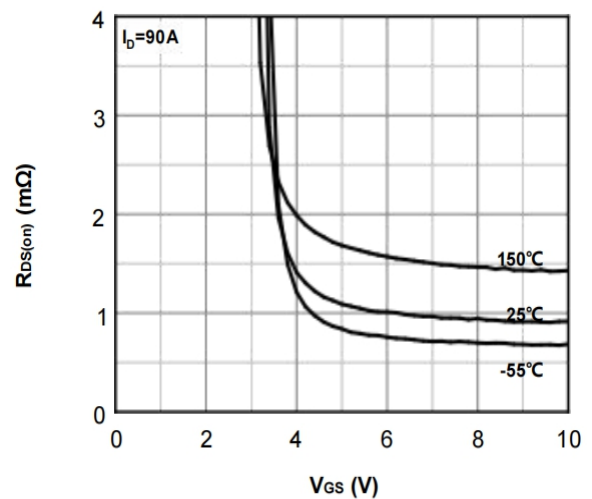


Fig.5 Normalized on-resistance vs junction temperature

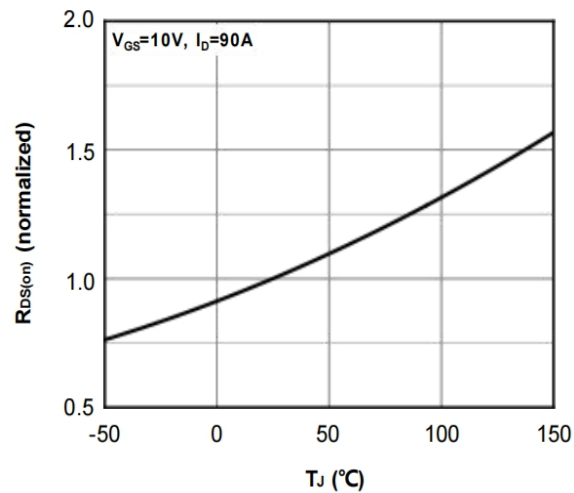
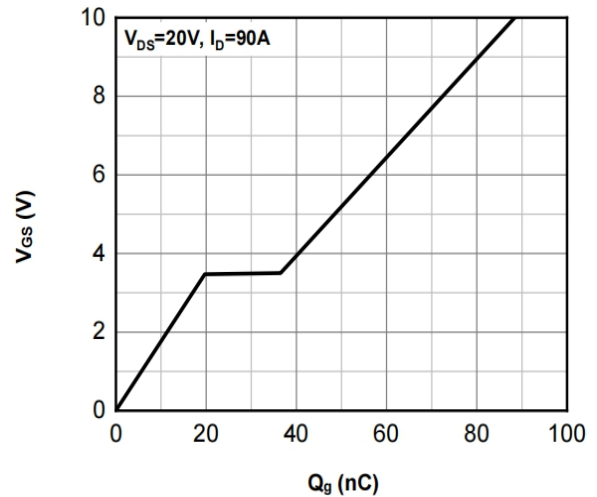


Fig.6 Typ. gate charge



RATINGS AND CHARACTERISTIC CURVES

Fig.7 Typ. forward characteristics of body diode

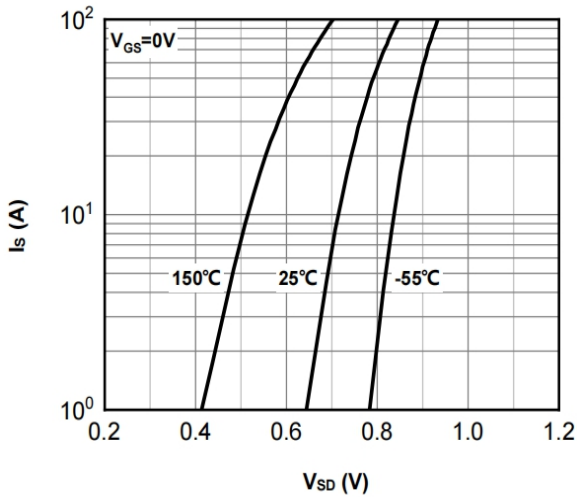


Fig.8 Safe operating area

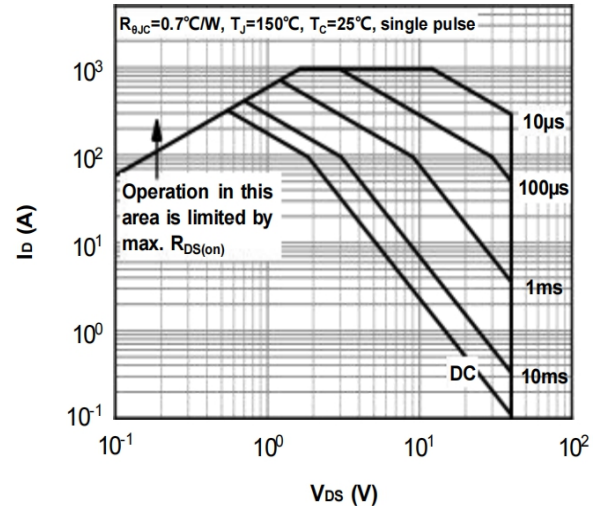


Fig.9 Typ. Capacitance

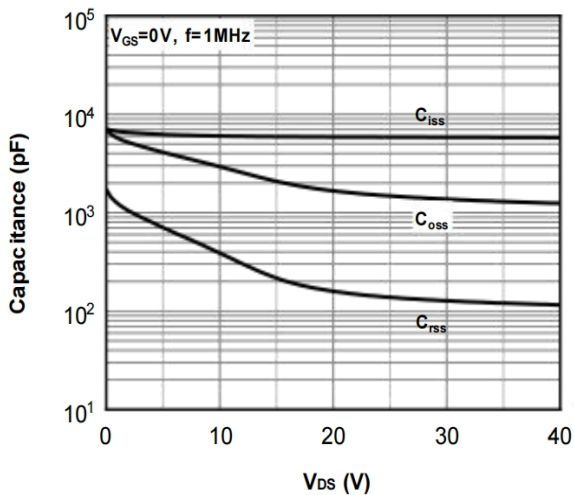


Fig.10 Single pulse maximum power dissipation

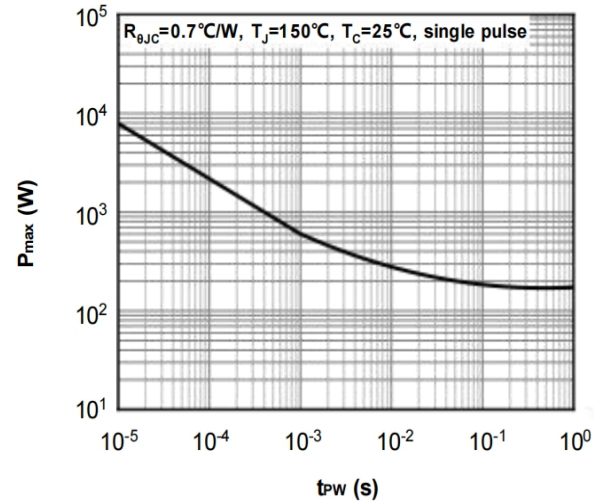


Fig.11 Max. power dissipation vs case temperature

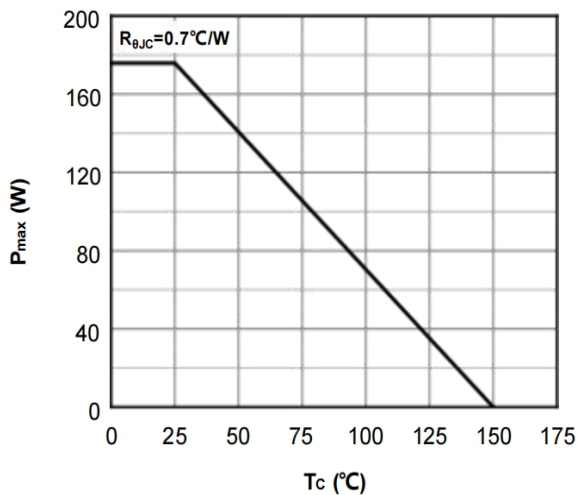
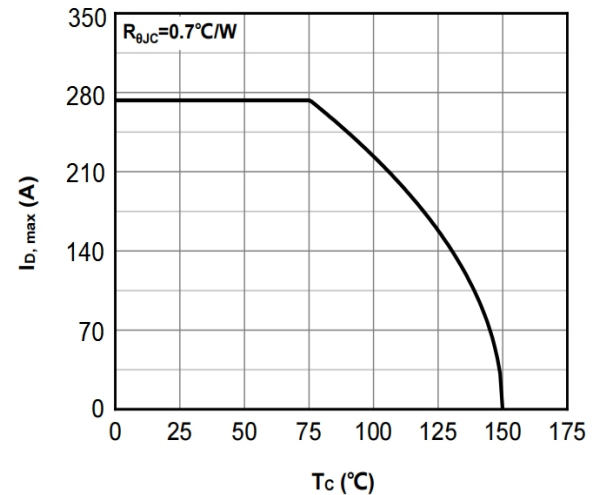


Fig.12 Max. continuous drain current vs case temperature



RATINGS AND CHARACTERISTIC CURVES

Fig.13 Normalized $V_{(BR)DSS}$ vs junction temperature

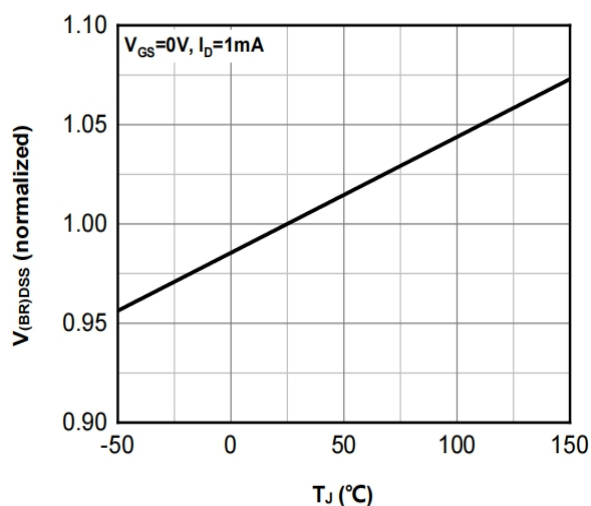


Fig.14 Normalized $V_{GS(th)}$ vs junction temperature

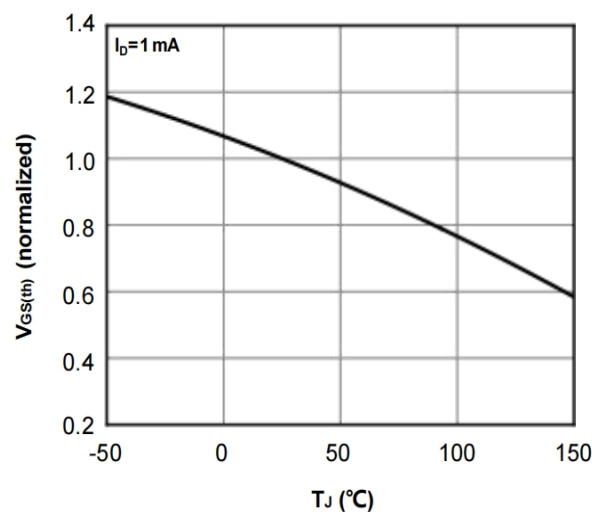
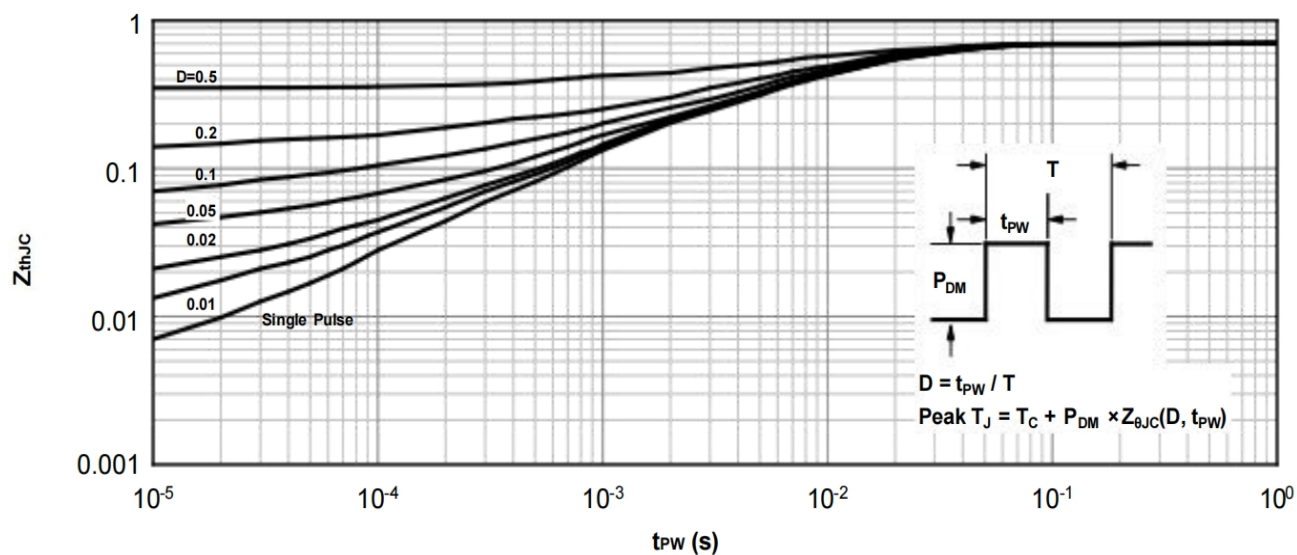


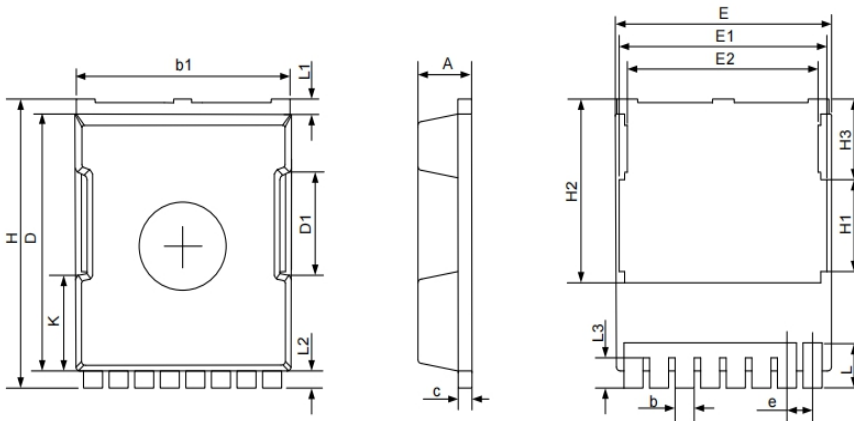
Fig.15 Transient thermal impedance from junction to case



Package Outline Dimensions millimeters

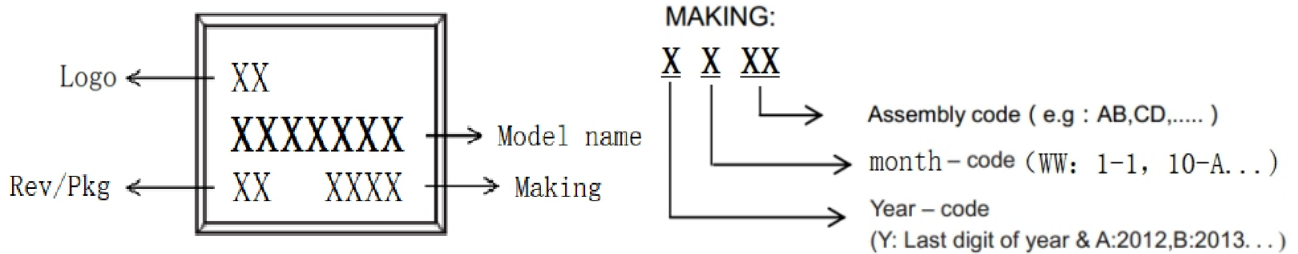
TOLL-8L

单位：毫米



SYMBOL	MILLIMETER		
	MIN	NOM	MAX
A	2.20	2.30	2.40
b	0.70	0.80	0.90
b1	9.70	9.80	9.90
c	0.40	0.50	0.60
D	10.28	10.38	10.48
D1	3.15	3.30	3.45
E	9.70	9.90	10.10
E1	9.30	9.50	9.70
E2	8.35	8.50	8.65
e	1.20 BSC		
H	11.48	11.73	11.88
H1	3.16	3.26	3.36
H2	7.20	7.35	7.50
K	4.03	4.18	4.33
L	1.60	1.85	2.10
L1	0.55	0.70	0.85
L2	0.45	0.60	0.75
L3	1.05	1.20	1.30

Marking on the body





LG280N04AL

N-Channel SGT Power MOSFET

Notice

All product, product specifications and data are subject to change without notice to improve. The right to explain is owned by LINGXUN electronics company.

Confirm that operation temperature is within the specified range described in the product specification. Avoid applying power exceeding normal rated

power; exceeding the power rating under steady-state loading condition may negatively affect product performance and reliability.

LINGXUN electronics shall not be in any way responsible or liable for failure induced under deviant condition from what is defined in this document.

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Revision History

Rev	Changes	Date
1.0	First version	2025/6/23