ZHEJIANG UNIU-NE Technology CO.,LTD

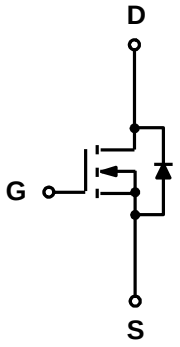
浙 江 宇 力 微 新 能 源 科 技 有 限 公 司

APG042N01 Data Sheet

V 1.1

Feature

- 100V,145A
  $R_{DS(ON)}$ <4.2mΩ @V_{GS}=10V TYP:3.7
- Advanced Trench Power MOSFET
- Provide Excellent $R_{DS(ON)}$ And Low Gate Charge



Application

- DC/DC Converter
- Load Switch for Portable Devices
- Battery Switch
- Rectifier

Marking and pin assignment

Package Marking and Ordering Information

Device Marking	Device	Device Package	Reel Size	Tape width	Quantity (PCS)
G042N01	APG042N01	TO-220		-	1000

ABSOLUTE MAXIMUM RATINGS (T_J=25℃ unless otherwise noted)

Parameter	Symbol	Value	Unit
Drain-Source Voltage	V_{DS}	100	V
Gate-Source Voltage	V_{GS}	±20	V
Continuous Drain Current (T_C =25℃)	I_D	145	A
Continuous Drain Current (T_C =100℃)	I_D	105	A
Pulsed Drain Current (1)	I_{DM}	380	A
Single Pulsed Avalanche Energy (2)	E_{AS}	660	mJ
Power Dissipation	P_D	215	W
Thermal Resistance from Junction to Case	$R_{\theta JC}$	0.44	℃/W
Junction Temperature	T_J	150	℃
Storage Temperature	T_{STG}	-55~ +150	℃

MOSFET ELECTRICAL CHARACTERISTICS(T_J=25℃ unless otherwise noted)

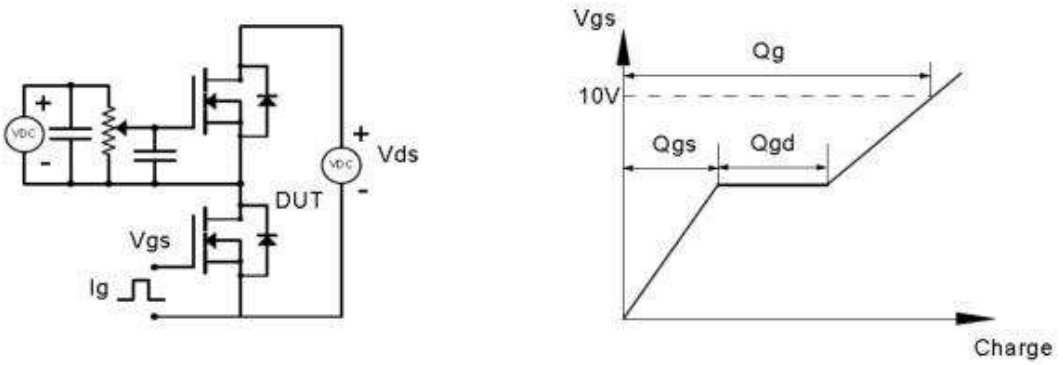
Parameter	Symbol	Test Condition	Min	Type	Max	Unit
Static Characteristics						
Drain-source breakdown voltage	$V_{(BR)DSS}$	V_{GS} = 0V, I_D =250μA	100	-	-	V
Zero gate voltage drain current	I_{DSS}	V_{DS} =100V, V_{GS} = 0V	-	-	1	μA
Gate-body leakage current	I_{GSS}	V_{GS} =±20V, V_{DS} = 0V	-	-	±100	nA
Gate threshold voltage(3)	$V_{GS(th)}$	V_{DS} =V_{GS}, I_D =250μA	2	3	4	V
Drain-source on-resistance(3)	$R_{DS(on)}$	V_{GS} =10V, I_D =70A	-	3.7	4.2	mΩ
Forward tranconductance(3)	g_{FS}	V_{DS} =10V, I_D =70A	-	122	-	S
Dynamic characteristics						
Input Capacitance	C_{iss}	V_{DS} =50V, V_{GS} =0V, f =1MHz	-	5678	-	pF
Output Capacitance	C_{oss}		-	673	-	
Reverse Transfer Capacitance	C_{rss}		-	27	-	
Switching characteristics						
Turn-on delay time	$t_{d(on)}$	V_{DD}=50V, I_D=70A, V_{GS}=10V, R_G=25Ω	-	25	-	ns
Turn-on rise time	t_r		-	33	-	
Turn-off delay time	$t_{d(off)}$		-	37	-	
Turn-off fall time	t_f		-	18	-	
Total Gate Charge	Qg	VDS=50V, ID=70A, VGS=10V	-	82	-	nC
Gate-Source Charge	Qgs		-	22	-	
Gate-Drain Charge	Qgd		-	20	-	
Source-Drain Diode characteristics						
Diode Forward voltage(3)	V_{DS}	V_{GS} =0V, I_S=140A	-	-	1.2	V
Diode Forward current(4)	I_S		-	-	140	A
Reverse recovery time	Trr	Is=70A,V_{GS}=0V,dI_F/dt=100A/us		71		ns
Reverse recovery charge	Qrr	Is=70A,V_{GS}=0V,dI_F/dt=100A/us		144		nC

Notes:

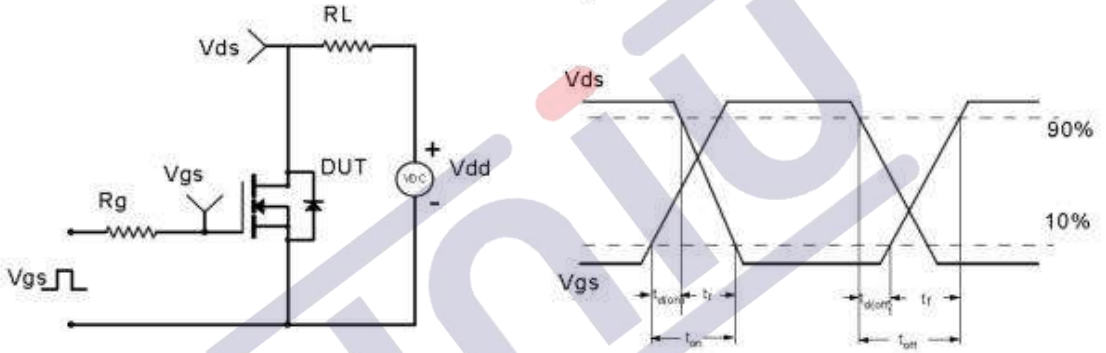
1. Repetitive Rating: pulse width limited by maximum junction temperature
2. EAS Condition:T_J=25℃,V_{DD}=50V,R_G=20Ω,L=0.5mH
3. Pulse Test: pulse width≤300μs, duty cycle≤2%
4. Surface Mounted on FR4 Board,t≤10 sec

Test Circuit & Waveform

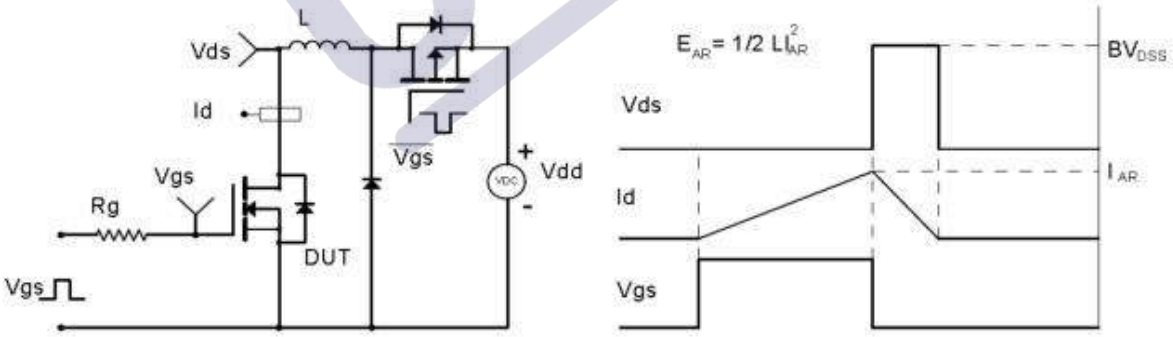
Gate Charge Test Circuit & Waveform



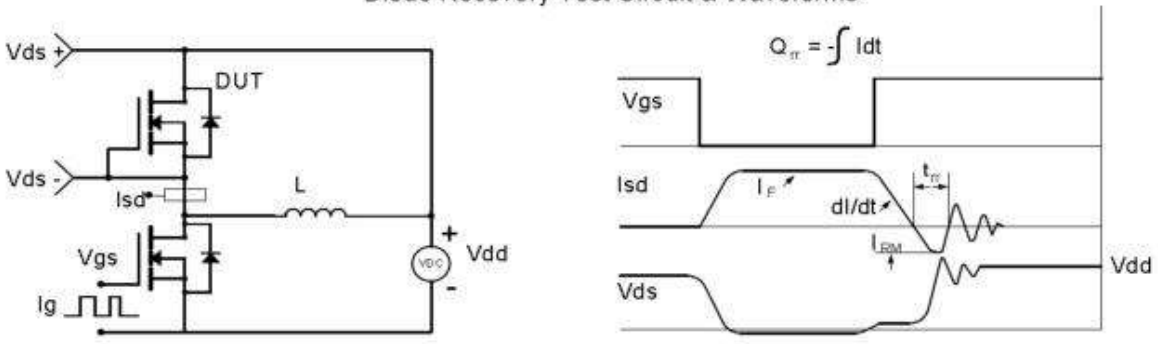
Resistive Switching Test Circuit & Waveforms



Unclamped Inductive Switching (UIS) Test Circuit & Waveforms



Diode Recovery Test Circuit & Waveforms



Typical Electronic and Thermal Characteristics

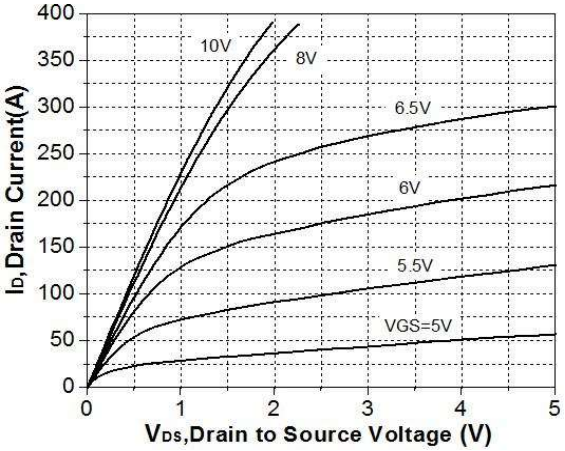


Figure 1. On-Region Characteristics

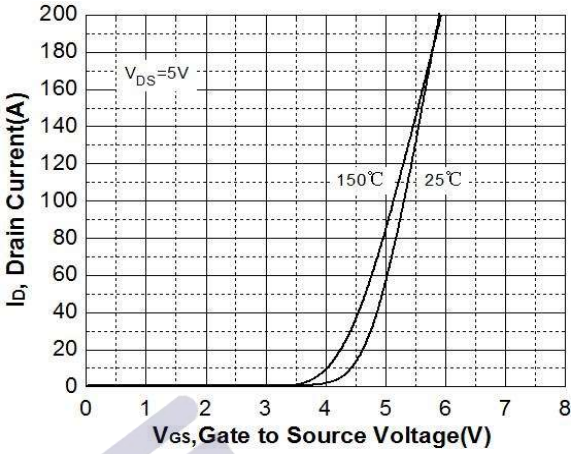


Figure 2. Transfer Characteristics

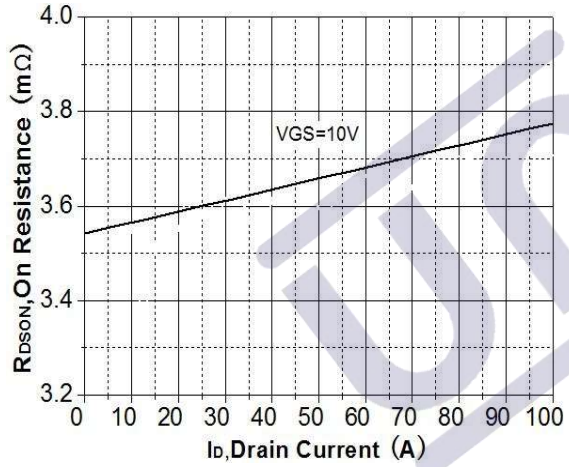


Figure 3. On-Resistance Variation vs Drain Current

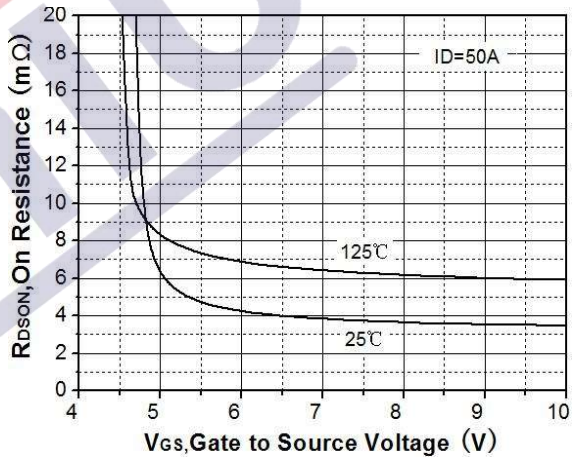


Figure 4. On-Resistance Vs Gate to Source Voltage

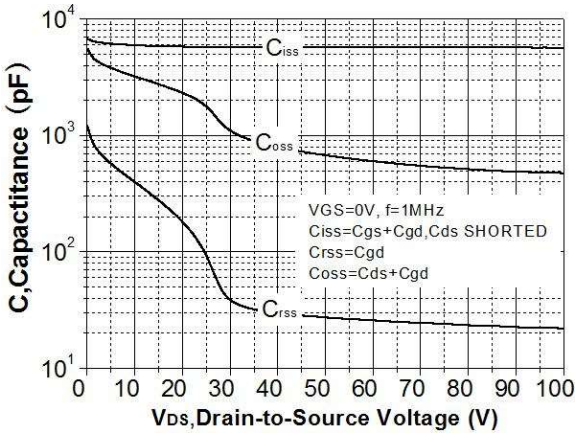


Figure 5. Capacitance Characteristics

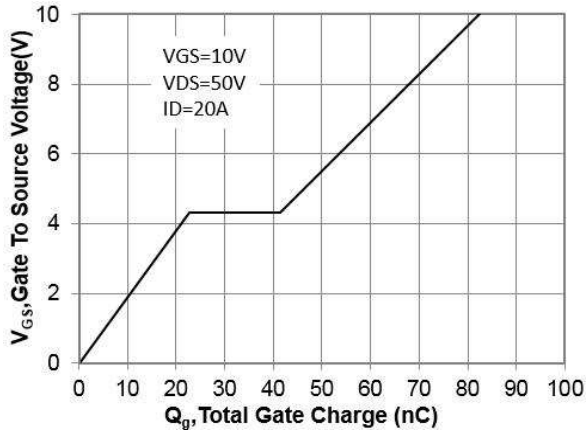


Figure 6. Gate Charge Characteristics

Typical Electronic and Thermal Characteristics

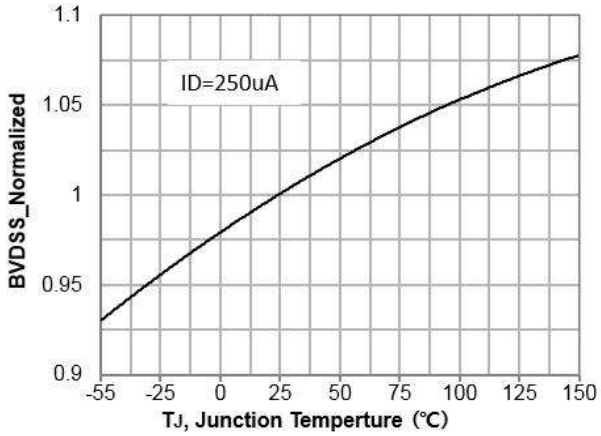


Figure 7. Breakdown Voltage Variation vs Temperature

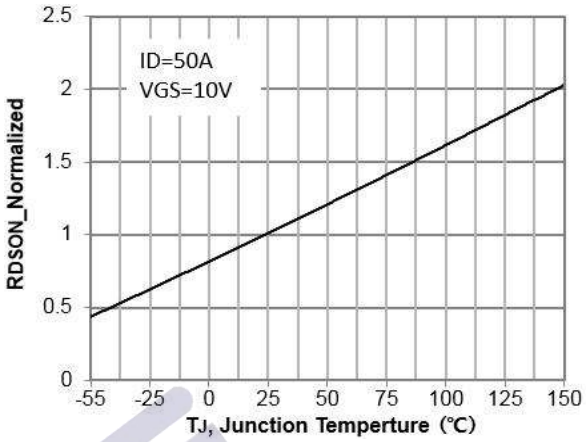


Figure 8. On-Resistance Variation vs Temperature

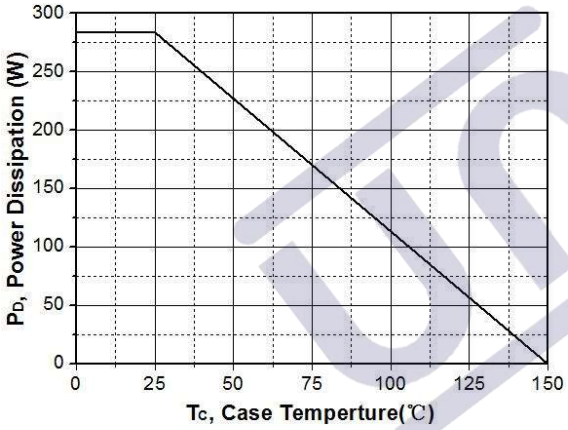


Figure 9. Power Dissipation

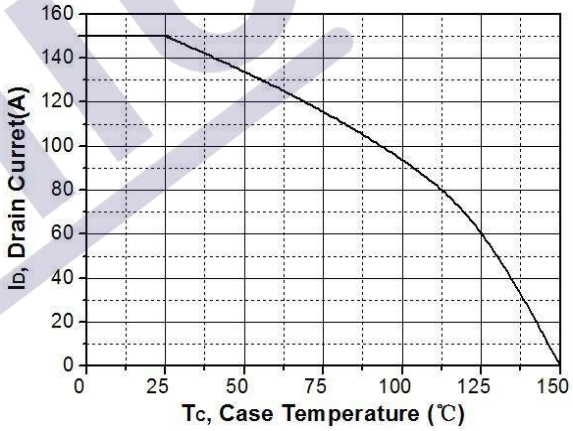


Figure 10. Drain Current Derating

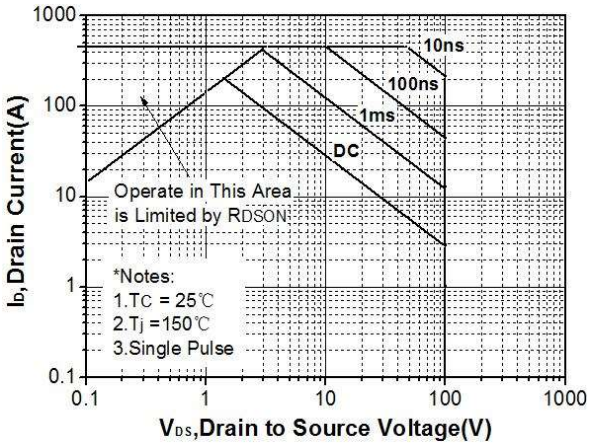


Figure 11. Maximum Safe Operating Area

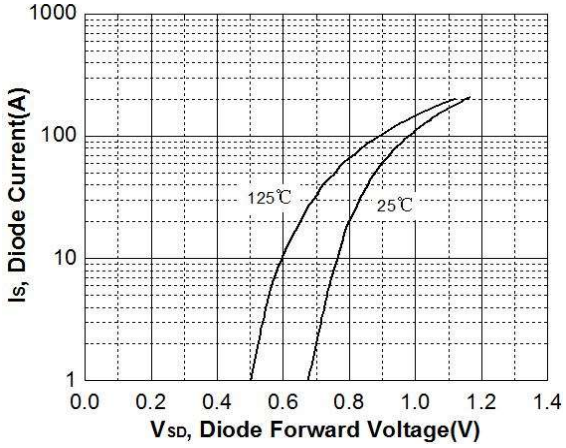
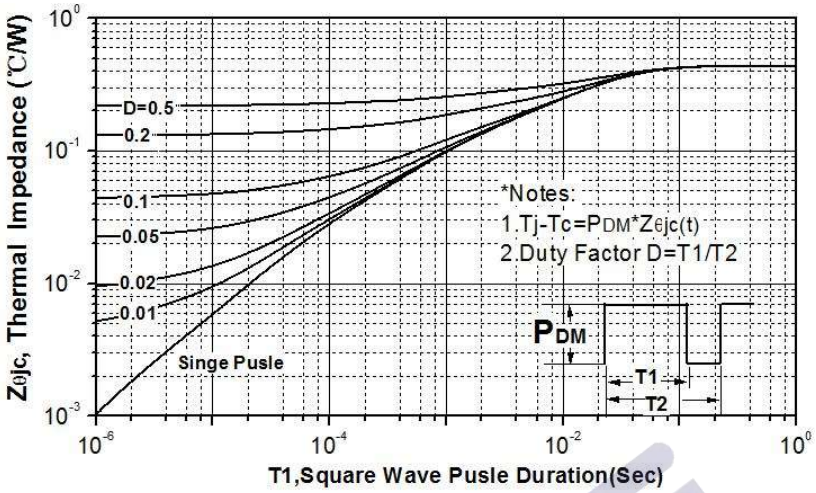
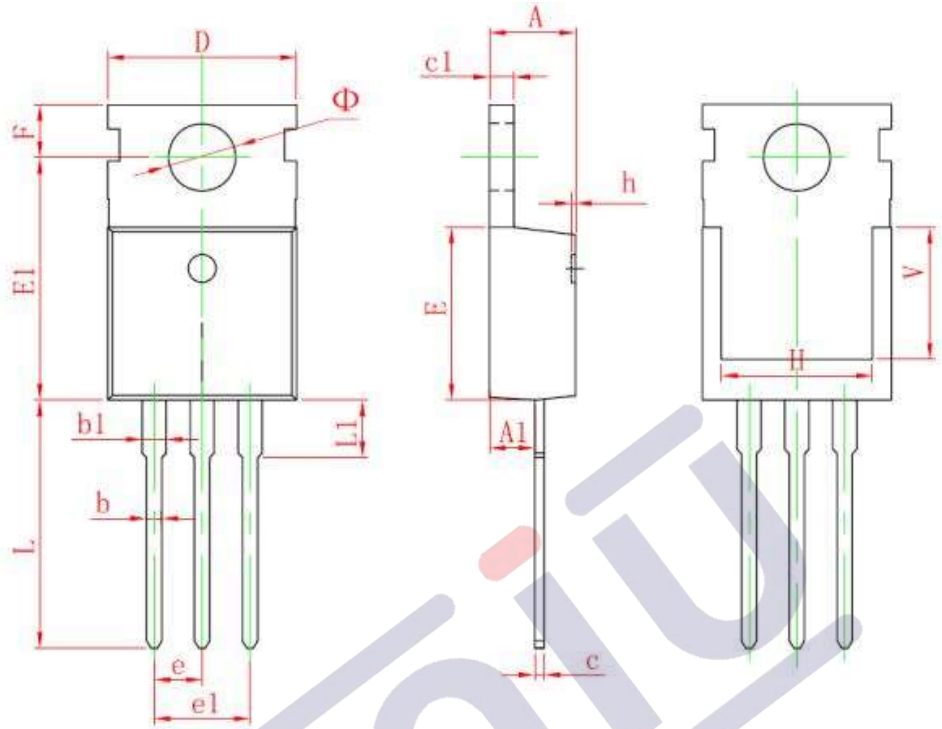


Figure 12. Body-diode Forward Characteristics

Typical Electronic and Thermal Characteristics



TO220 Package Information



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	4.400	4.600	0.173	0.181
A1	2.250	2.550	0.089	0.100
b	0.710	0.910	0.028	0.036
b1	1.170	1.370	0.046	0.054
c	0.330	0.650	0.013	0.026
c1	1.200	1.400	0.047	0.055
D	9.910	10.250	0.390	0.404
E	8.950	9.750	0.352	0.384
E1	12.650	13.050	0.498	0.514
e	2.540 TYP.		0.100 TYP.	
e1	4.980	5.180	0.196	0.204
F	2.650	2.950	0.104	0.116
H	7.900	8.100	0.311	0.319
h	0.000	0.300	0.000	0.012
L	12.900	13.400	0.508	0.528
L1	2.850	3.250	0.112	0.128
V	6.900 REF.		0.276 REF.	
Φ	3.400	3.800	0.134	0.150

1.版本记录

DATE	REV.	DESCRIPTION
2021/01/20	1.0	Initial Release
2022/09/11	1.1	Layout Adjustment

2.免责声明

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