BRCS020N10SHTL

Rev.A Mar.-2025

DATA SHEET

/ Descriptions

TOLL-8L N

N-Channel MOSFET in a TOLL-8L Plastic Package .

/ Features

V_{DS}(V)=100V I_D=259A

$R_{DS(ON)}$@10V≤2.0mΩ(Typ. 1.6mΩ)

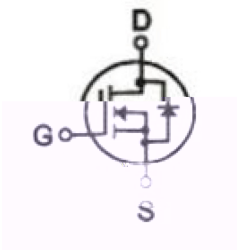
HF Product.

/ Applications

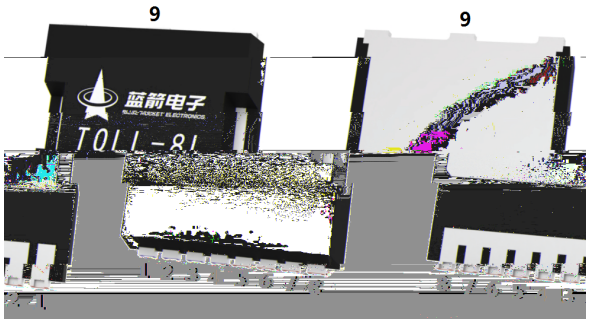
DC/DC

DC/DC converter,Power switch,Motor drives.

/ Equivalent Circuit



/ Pinning



PIN1 G PIN2 3 4 5 6 7 8 S PIN9 D

/ Marking

See Marking Instructions.

/ Absolute Maximum Ratings(T_C=25)

Parameter		Symbol	Rating	Unit
Drain-Source Voltage		V_{DS}	100	V
Drain Current - Continuous		I_D	259	A
Drain Current – Pulsed		I_{DM}	1036	A
Gate-Source Voltage		V_{GS}	± 20	V
Power Dissipation		P_{tot}	250	W
Single Pulse Avalanche Energy(V_{DD}=50V,L=0.1mH)		E_{AS}	205	mJ
Junction and Storage Temperature Range		T_j, T_{stg}	-55 to 150	
Thermal resistance, junction - ambient	Steady-State	$R_{\theta JA}$	40	/ W
Thermal resistance, junction - case	Steady-State	$R_{\theta JC}$	0.5	

/ Electrical Characteristics(Ta=25)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Drain-Source Breakdown Voltage	BV_{DSS}	I_D=250uA, V_{GS}=0V	100			V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS}=100V, V_{GS}=0V			1	uA
Gate-Body leakage current	I_{GSS}	V_{DS}=0V, V_{GS}= ±20V			±100	nA
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS}=V_{GS}, I_D=250uA	2.2	3.0	3.8	V
Static Drain-Source On-Resistance	$R_{DS(ON)}$	V_{GS}=10V, I_D=100A		1.6	2.0	mΩ
Diode Forward Voltage	V_{SD}	I_S=100A, V_{GS}=0V		0.9	1.2	V
Gate Resistance	R_g	f=1.0MHz		1.2		Ω
Input Capacitance	C_{iss}	V_{DS}=50V V_{GS}=0V f=1.0MHz		10120		pF
Output Capacitance	C_{oss}			1360		
Reverse Transfer Capacitance	C_{rss}			50		
Total Gate Charge	Q_g	V_{GS}=10V, V_{DS}=50V I_{DS}=100A		176		nC
Gate Source Charge	Q_{gs}			47		
Gate Drain Charge	Q_{gd}			54		

/ Electrical Characteristics(Ta=25)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Turn-On Delay Time	$t_{d(on)}$	V_{GS}=10V V_{DS}=50V R_G=6Ω I_D=100A		85		ns
Turn-On Rise Time	t_r			137		
Turn-Off Delay Time	$t_{d(off)}$			92		
Turn-Off Fall Time	t_f			98		
Reverse Recovery Time	t_{rr}	I_F = 50 A, V_{DS} = 50 V dI_{SD}/dt = 100 A/ μ s		79		ns
Reverse Recovery Charge	Q_{rr}			180		nC

/ Electrical Characteristic Curve

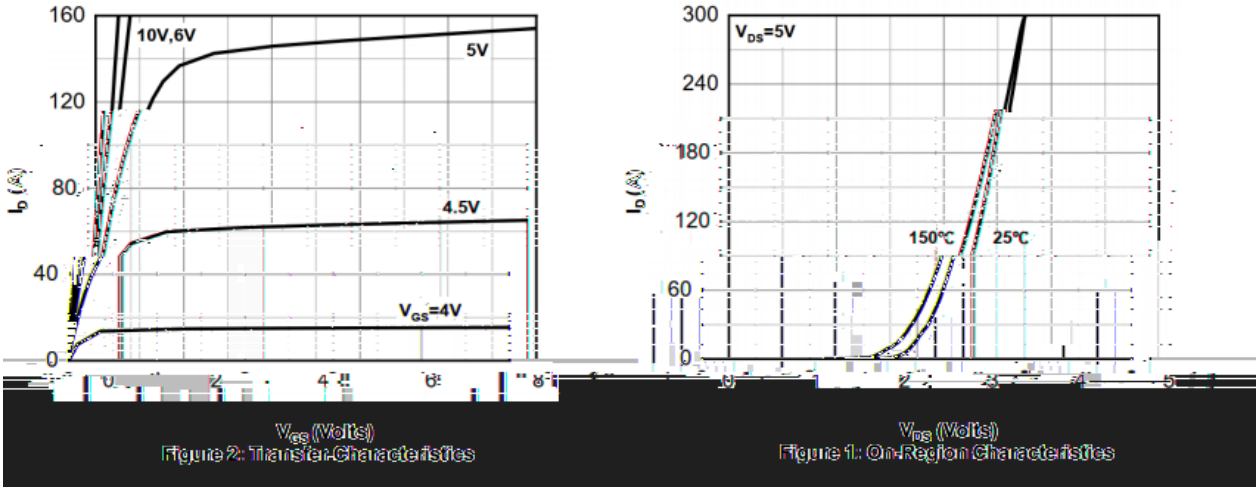


Figure 2: Transfer Characteristics

Figure 1: On-Region Characteristics

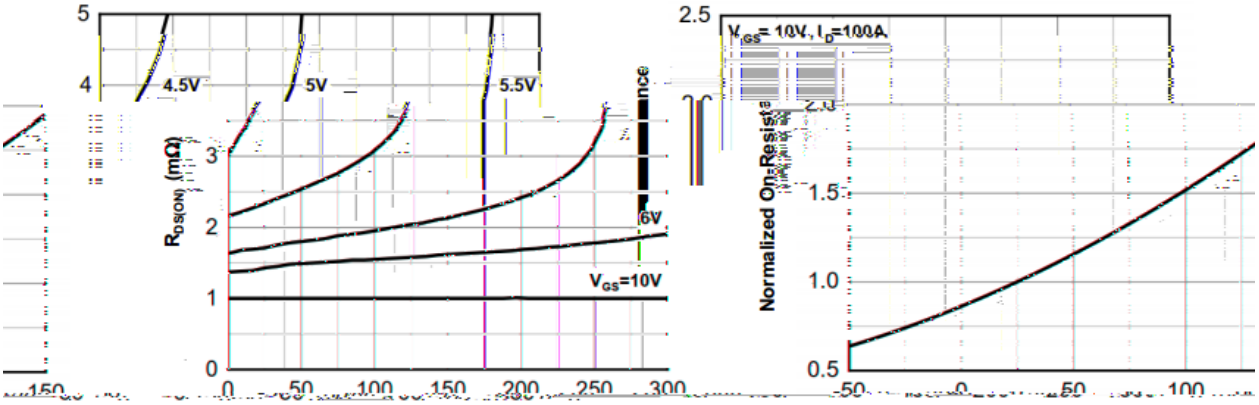


Figure 4: On-Resistance vs. Junction Temperature

Figure 3: On-Resistance vs. Drain Current and Gate Voltage

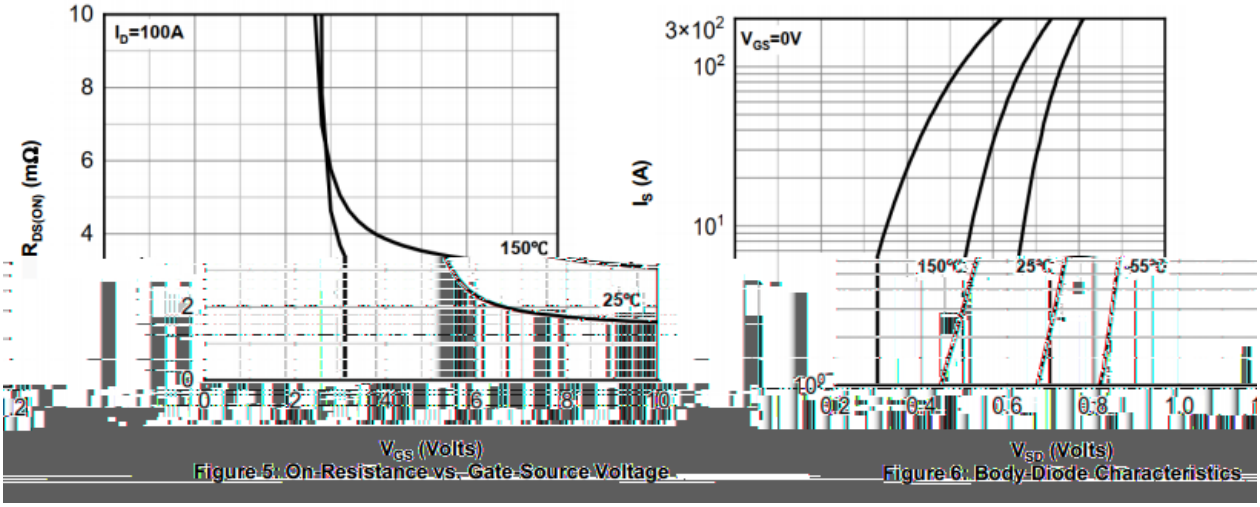


Figure 5: On-Resistance vs. Gate-Source Voltage

Figure 6: Body Diode Characteristics

/ Electrical Characteristic Curve

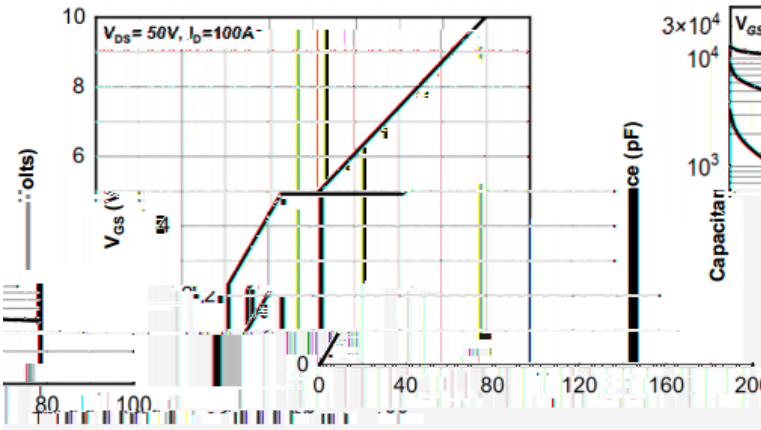


Figure 8: Capacitance Characteristics

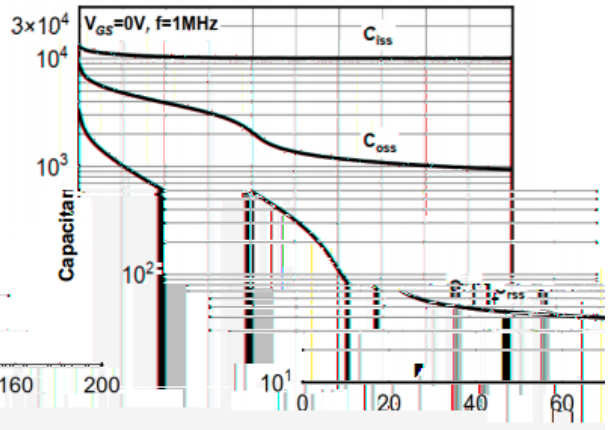


Figure 7: Gate-Charge Characteristics

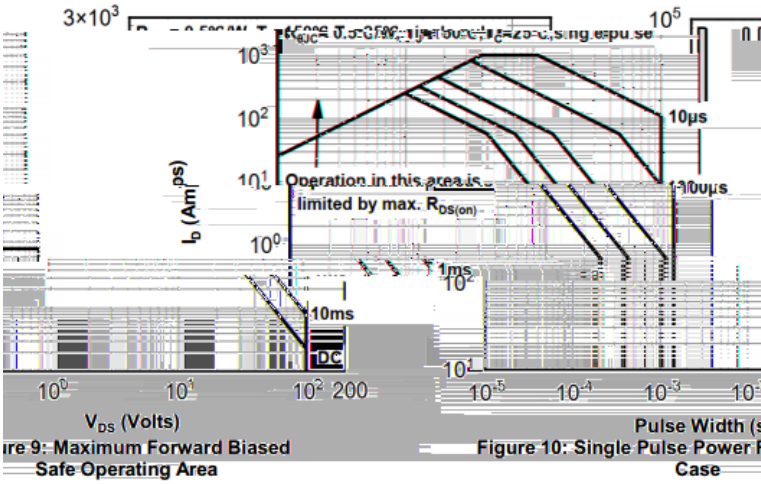


Figure 9: Maximum Forward Biased Safe Operating Area

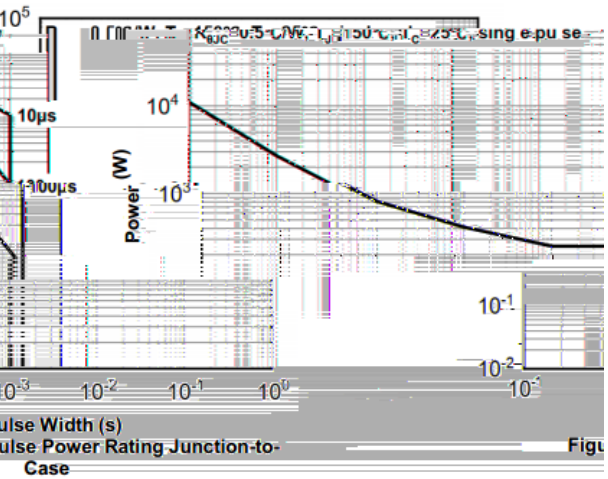
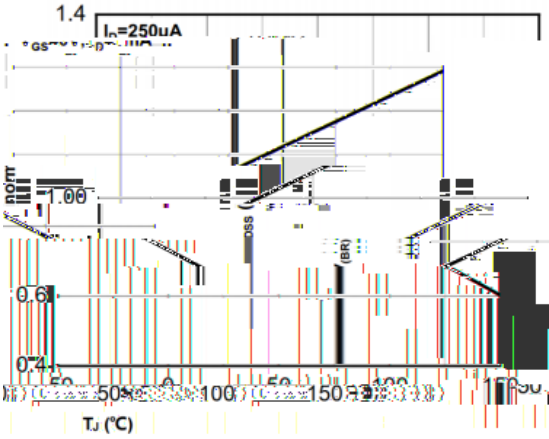


Figure 10: Single Pulse Power Rating Junction-to-Case



ormalized V(BR)DSS vs. Junction Temperature

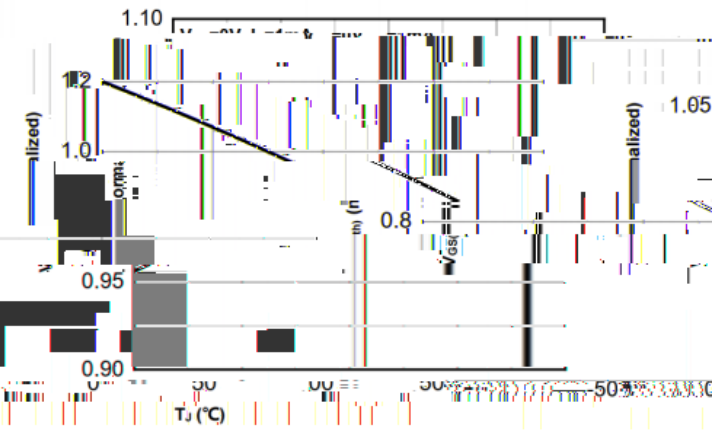


Figure 11: Normalized VGS(th) vs. Junction Temperature

Figure 12: N

/ Electrical Characteristic Curve

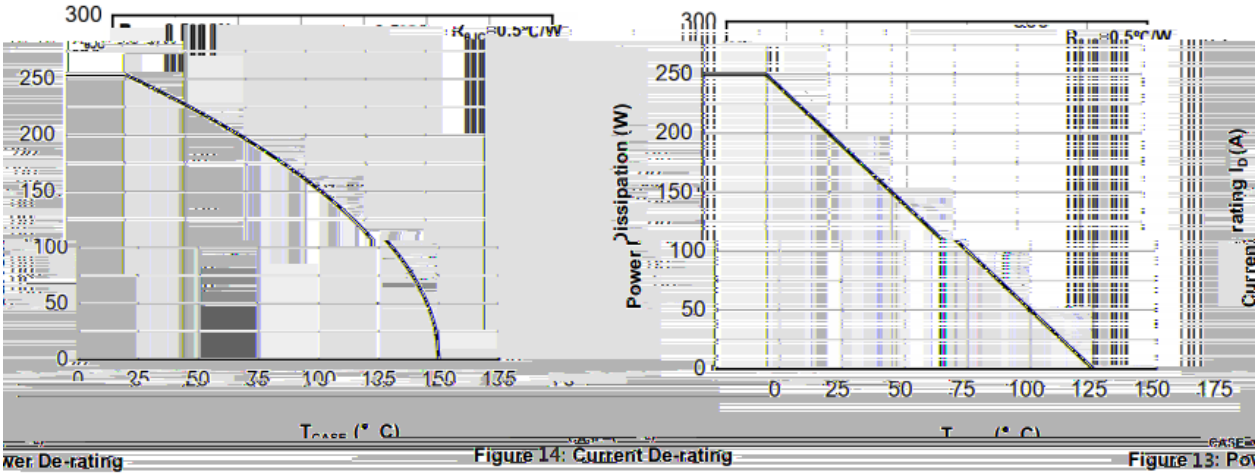


Figure 14: Current De-rating

Figure 13: Power De-rating

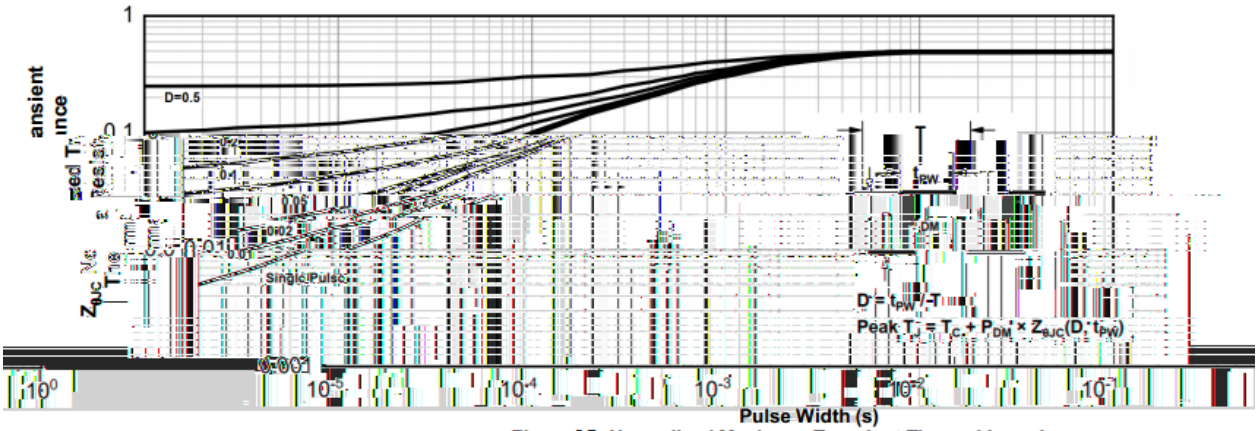
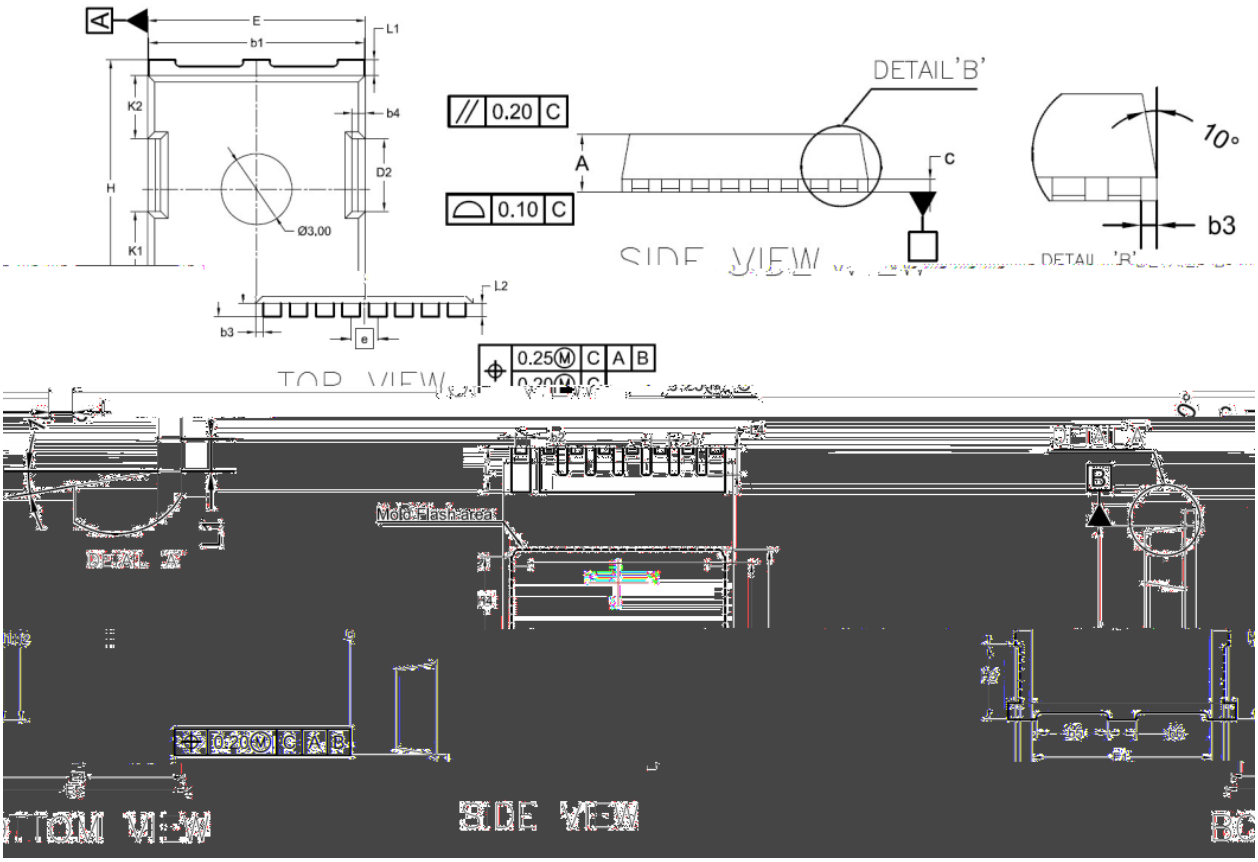


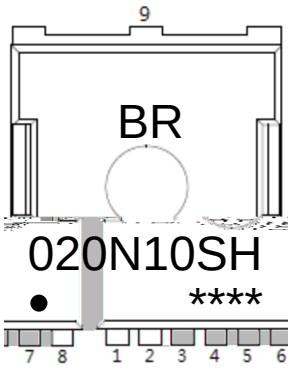
Figure 15: Normalized Maximum Transient Thermal Impedance

/ Package Dimensions



A	2.200	2.300	2.400	b1	9.700	9.800	9.900
c	0.492	0.500	0.508	b1	0.420	0.460	0.500
D	10.280	10.380	10.480	b3		0.350	
E	9.800	9.900	10.000	b4		0.600	
e		1.20 BSC		b5		3.100	
H	11.580	11.680	11.780	b6		1.200	
H1	6.650	6.750	6.850	L	1.700	1.900	2.100
H2		7.300		L1		0.700	
H3		3.200		L2		0.600	
H4		3.800		L4	1.050	1.150	1.250
K1		4.180		L5	0.500	0.600	0.700
K2		2.900		E1		7.800	
D2		3.300		E4		8.800	
b	0.700	0.800	0.900	E5		9.200	

/ Marking Instructions



BR

020N10SH

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Note

BR	Company Code
020N10SH	Product Type Code
****:	Lot No. Code, code change with Lot No.

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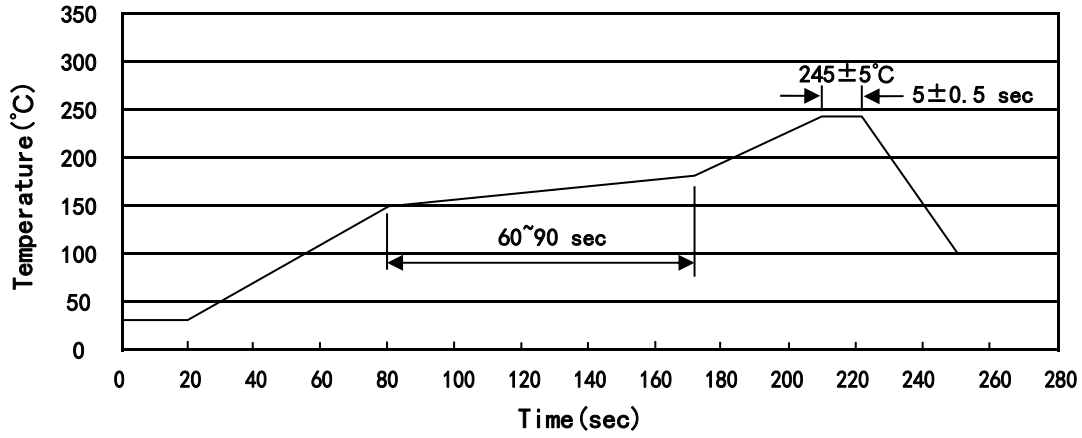

Note:

1 150 180 60 90sec;

1.Preheating:150~180 , Time:60~90sec.

2 245±5 5±0.5sec;

2.Peak Temp.:245±5 , Duration:5±0.5sec.

3 2 10 /sec.

3. Cooling Speed: 2~10 /sec.

/ Resistance to Soldering Heat Test Conditions

260±5 10±1 sec. Temp.:260±5 Time:10±1 sec

/ Packaging SPEC.

/ REEL

Package Type	Units					Dimension		(unit mm³)
	Units/Reel /	Reels/Inner Box /	Units/Inner Box /	Inner Boxes/Outer Box /	Units/Outer Box /	Reel	Inner Box	Outer Box
TOLL-8L	2,000	1	2,000	6	12,000	13''×24	360×360×50	380×335×366

/ Notices

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