

# BRCS013N04SHTL

Rev.B Dec.-2024

## 描述 / Descriptions

TOLL-8L 封装 N 沟道场效应管。  
N-Channel MOSFET in a TOLL-8L Plastic Package.

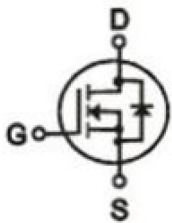
## 特征 / Features

$V_{DS}(V)=40V$      $I_D=297A$   
 $R_{DS(ON)}@10V \leq 1.3m\Omega$  (Typ.1.1mR)  
无卤产品。HF Product.

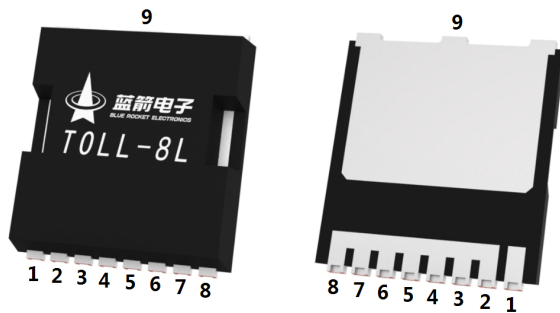
## 用途 / Applications

电机驱动器，直流-直流转换器。  
Motor drivers, DC - DC Converter.

## 内部等效电路 / Equivalent Circuit



## 引脚排列 / Pinning



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

## 印章代码 / Marking

见印章说明。  
See Marking Instructions.

**极限参数 / Absolute Maximum Ratings( $T_c=25^\circ\text{C}$ )**

参数 Parameter	符号 Symbol	数值 Rating	单位 Unit
Drain-Source Voltage	$V_{DS}$	40	V
Drain Current - Continuous	$I_D$	297	A
Drain Current - Continuous	$I_D(T_c=100^\circ\text{C})$	210	A
Drain Current – Pulsed	$I_{DM}$	1100	A
Gate-Source Voltage	$V_{GS}$	$\pm 20$	V
Power Dissipation	$P_{tot}$	150	W
Continuous-Source Current	$I_S$	297	A
Single Pulse Avalanche Energy( $V_{DD}=50\text{V}, L=1\text{mH}$ )	$E_{AS}$	1225	mJ
Junction and Storage Temperature Range	$T_j, T_{stg}$	-55 to 175	$^\circ\text{C}$
Thermal resistance, junction - ambient	Steady-State $R_{\theta JA}$	44.9	$^\circ\text{C}/\text{W}$
Thermal resistance, junction - case	Steady-State $R_{\theta JC}$	1	

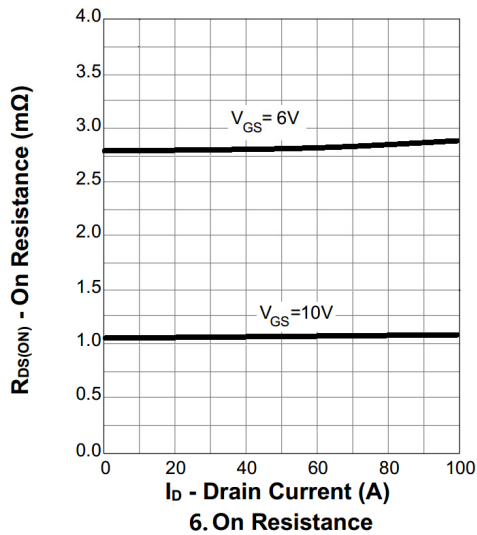
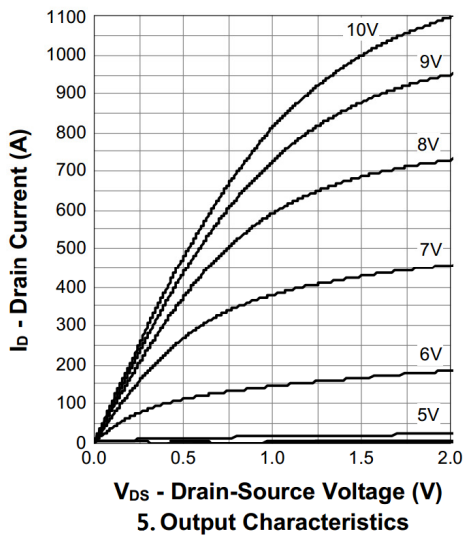
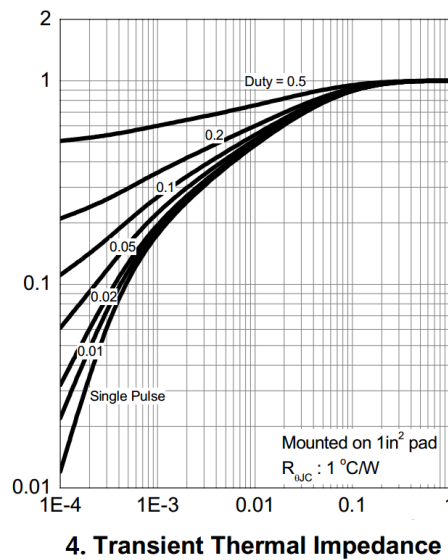
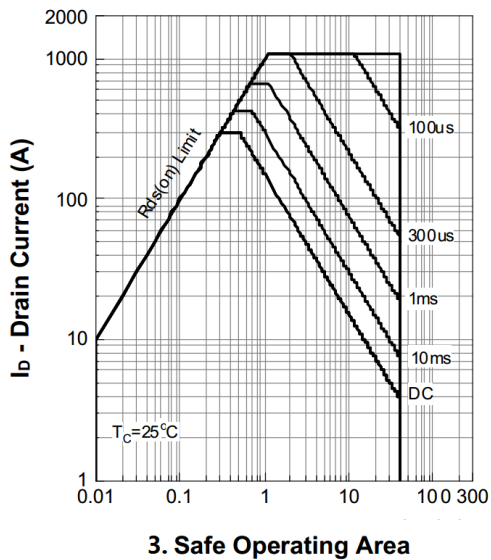
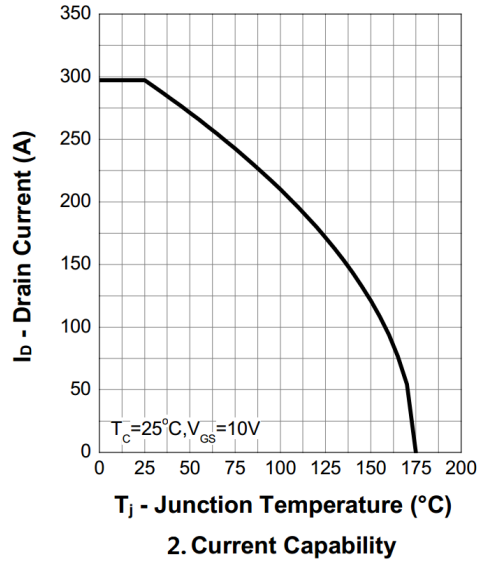
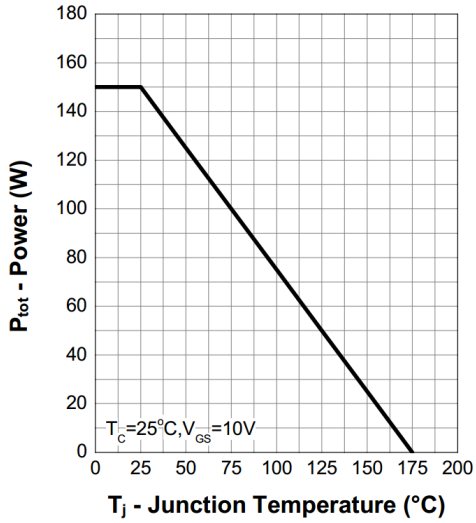
**电性能参数 / Electrical Characteristics( $T_a=25^\circ\text{C}$ )**

参数 Parameter	符号 Symbol	测试条件 Test Conditions	最小值 Min	典型值 Typ	最大值 Max	单位 Unit
Drain-Source Breakdown Voltage	$BV_{DSS}$	$I_D=250\mu\text{A}, V_{GS}=0\text{V}$	40			V
Zero Gate Voltage Drain Current	$I_{DSS}$	$V_{DS}=32\text{V}, V_{GS}=0\text{V}$			1	$\mu\text{A}$
Gate-Body leakage current	$I_{GSS}$	$V_{DS}=0\text{V}, V_{GS}=\pm 20\text{V}$			$\pm 100$	nA
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=250\mu\text{A}$	2.0		4.0	V
Static Drain-Source On-Resistance	$R_{DS(ON)}$	$V_{GS}=10\text{V}, I_D=30\text{A}$		1.1	1.3	$\text{m}\Omega$
	$R_{DS(ON)}$	$V_{GS}=6\text{V}, I_D=20\text{A}$		2.8	3.2	$\text{m}\Omega$
Diode Forward Voltage	$V_{SD}$	$I_S=30\text{A}, V_{GS}=0\text{V}$			1.3	V
Input Capacitance	$C_{iss}$	$V_{DS}=20\text{V}, V_{GS}=0\text{V}$ $f=1.0\text{MHz}$		4875		pF
Output Capacitance	$C_{oss}$			2047		
Reverse Transfer Capacitance	$C_{riss}$			175		
Total Gate Charge	$Q_g$	$V_{GS}=10\text{V}, V_{DS}=20\text{V}$ $I_{DS}=30\text{A}$		80		nC
Gate Source Charge	$Q_{gs}$			27		
Gate Drain Charge	$Q_{gd}$			19		

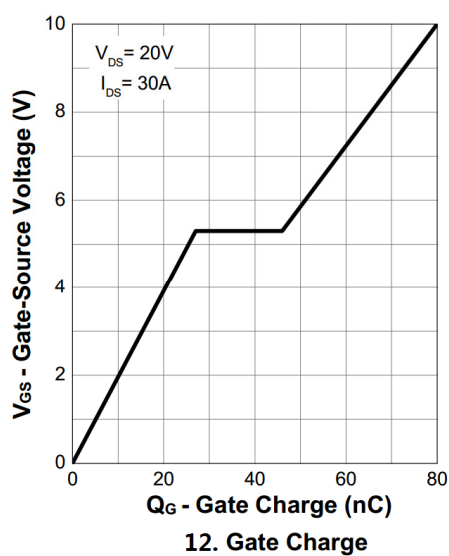
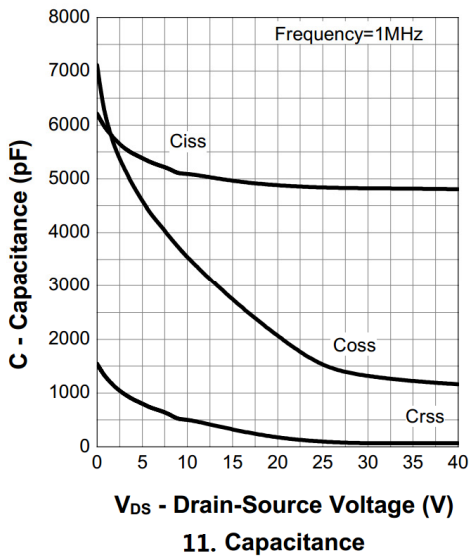
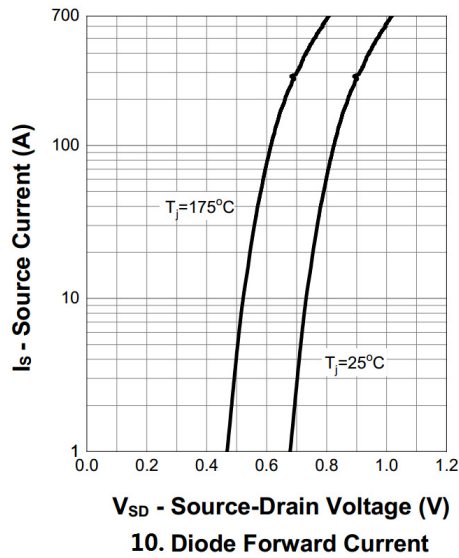
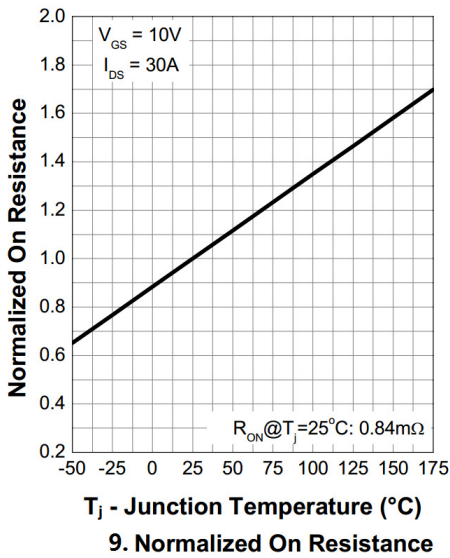
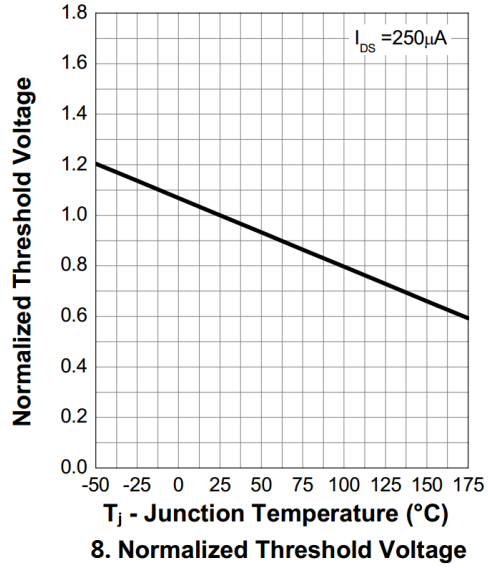
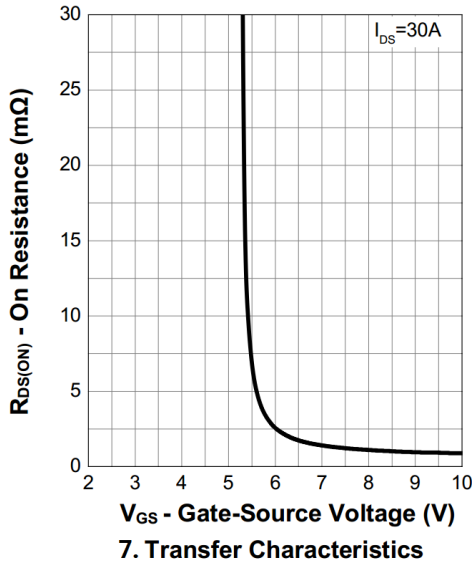
## 电性能参数 / Electrical Characteristics(Ta=25°C)

参数 Parameter	符号 Symbol	测试条件 Test Conditions	最小值 Min	典型值 Typ	最大值 Max	单位 Unit
Turn-On Delay Time	$t_{d(on)}$	$V_{GS}=10V$ $V_{DS}=20V$ $R_L=0.66$ $R_G=3.9\Omega$ $I_{DS}=30A$		19		ns
Turn-On Rise Time	$t_r$			79		
Turn-Off Delay Time	$t_{d(off)}$			52		
Turn-Off Fall Time	$t_f$			44		
Reverse Recovery Time	$t_{rr}$	$I_{DS} = 30 A, V_{GS} = 0 V$		62.3		nS
Reverse Recovery Charge	$Q_{rr}$	$dI_{SD}/dt = 100 A/\mu s$		66.6		nC

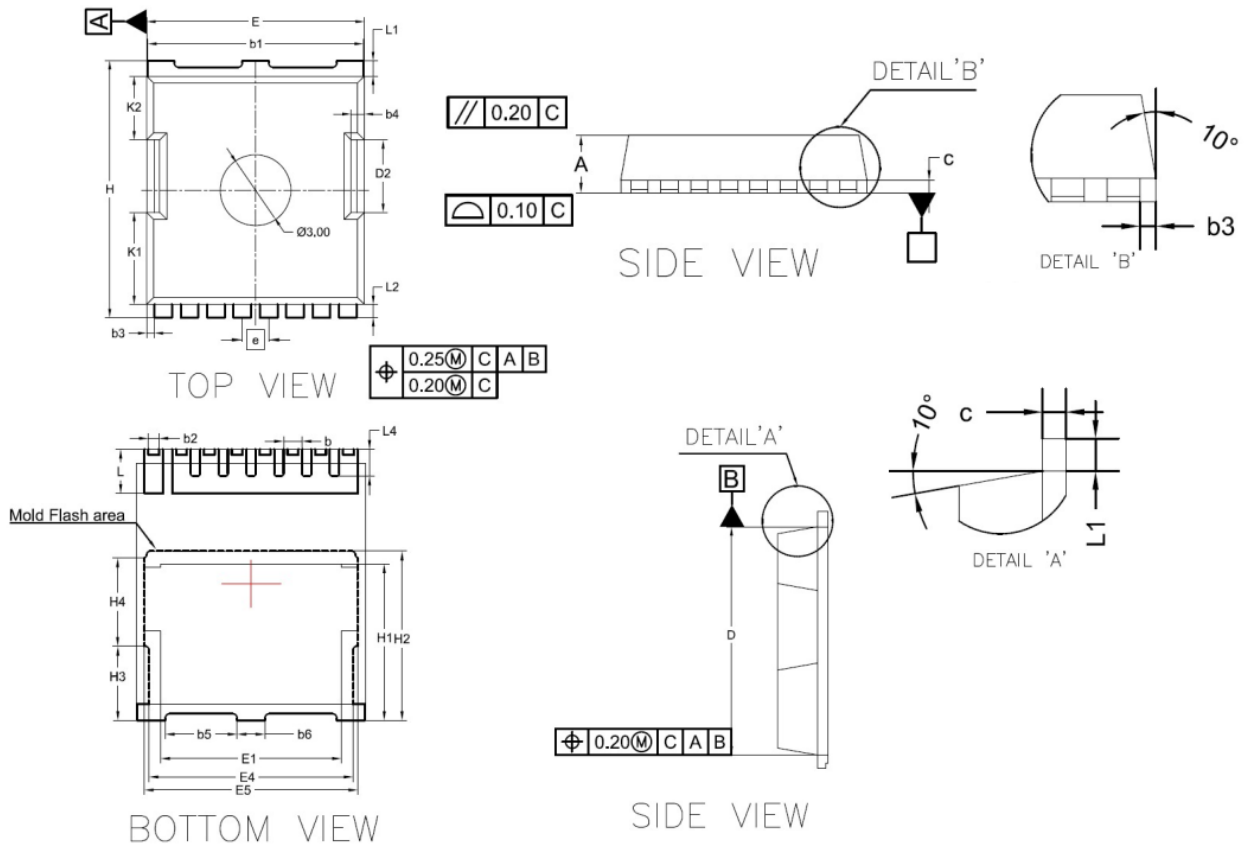
**电参数曲线图 / Electrical Characteristic Curve**



**电参数曲线图 / Electrical Characteristic Curve**

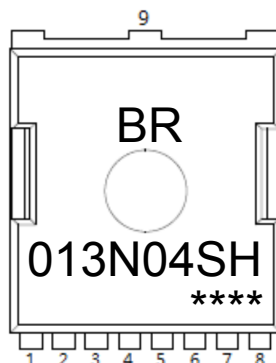


**外形尺寸图 / Package Dimensions**



Symbol	Dimensions In Millimeters			Symbol	Dimensions In Millimeters		
	MIN.	NOM.	MAX.		MIN.	NOM.	MAX.
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		

## 印章说明 / Marking Instructions



说明：

BR： 为公司代码

013N04SH： 为型号代码

\*\*\*\*： 为生产批号代码，随生产批号变化

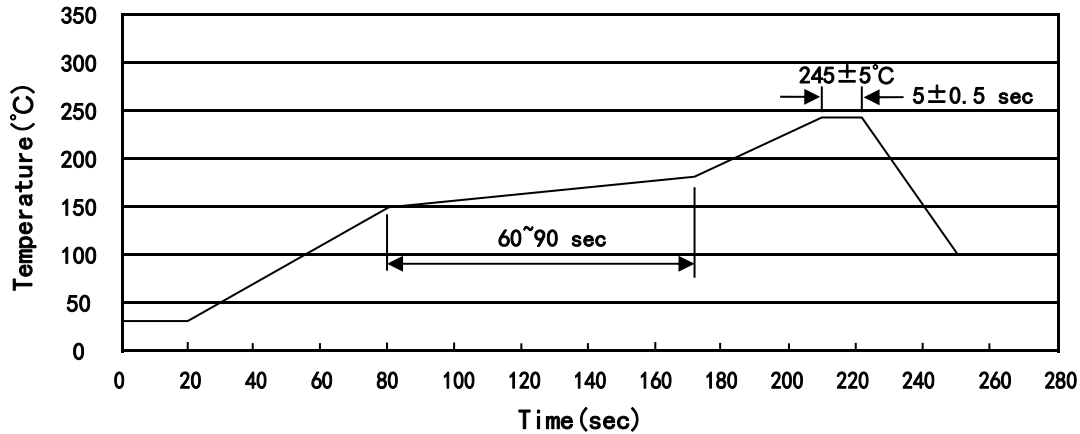
Note：

BR： Company Code

013N04SH： Product Type Code

\*\*\*\*: Lot No. Code, code change with Lot No

**回流焊温度曲线图(无铅) / Temperature Profile for IR Reflow Soldering(Pb-Free)**



说明：

- 1、预热温度 150~180°C，时间 60~90sec;
- 2、峰值温度 245±5°C，时间持续为 5±0.5sec;
- 3、焊接制程冷却速度为 2~10°C/sec.

Note:

- 1.Preheating:150~180°C, Time:60~90sec.
- 2.Peak Temp.:245±5°C, Duration:5±0.5sec.
3. Cooling Speed: 2~10°C/sec.

**耐焊接热试验条件 / Resistance to Soldering Heat Test Conditions**

温度：260±5°C

时间：10±1 sec.

Temp.:260±5°C

Time:10±1 sec

**包装规格 / Packaging SPEC.**

卷盘包装 / REEL

Package Type 封装形式	Units 包装数量					Dimension 包装尺寸 (unit: mm <sup>3</sup> )		
	Units/Reel 只/卷盘	Reels/Inner Box 卷盘/盒	Units/Inner Box 只/盒	Inner Boxes/Outer Box 盒/箱	Units/Outer Box 只/箱	Reel	Inner Box 盒	Outer Box 箱
TOLL-8L	2,000	1	2,000	6	12,000	13"×24	360×360×50	380×335×366

**使用说明 / Notices**