描述 / Descriptions

TOLT-16L 封装 N 沟道场效应管。
N-Channel MOSFET in a TOLT-16L Plastic Package .

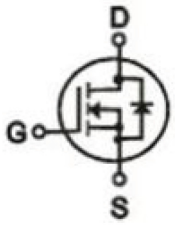
特征 / Features

V_{DS}(V)=60V I_D=860A
$R_{DS(ON)}$@10V≤0.5mΩ(Typ. 0.38 mΩ)
$R_{DS(ON)}$@6V≤0.9mΩ(Typ. 0.66 mΩ)
无卤产品。 HF Product.

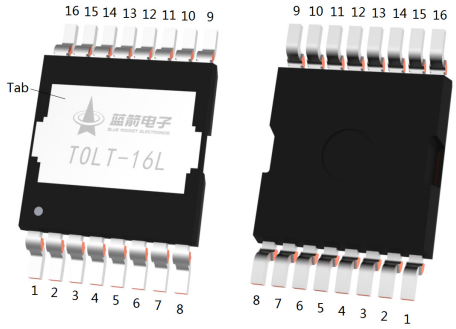
用途 / Applications

BMS，无人机，大功率逆变系统，轻型电动车。
BMS, Drones, High power inverter system, Light electric vehicles.

内部等效电路 / Equivalent Circuit



引脚排列 / Pinning



PIN1、2、3、4、5、6、7：S PIN8：G PIN9、10、11、12、13、14、15、16、Tab：D

印章代码 / Marking

见印章说明。
See Marking Instructions.

极限参数 / Absolute Maximum Ratings(T_A=25℃)

参数 Parameter	符号 Symbol	数值 Rating	单位 Unit
Drain-Source Voltage	V_{DS}	60	V
Drain Current(DC)	I_D(T_C=25℃)	860	A
	I_D(T_C=100℃)	607	A
Drain Current – Pulsed*,**	I_{DM}	2714	A
Gate-Source Voltage	V_{GS}	±20	V
Power Dissipation	P_{tot}	680	W
Single Pulse Avalanche Energy	E_{AS}	7455	mJ
Junction and Storage Temperature Range	T_j, T_{stg}	-55 to 175	℃
Thermal resistance, junction – ambient**	$R_{\theta JA}$	48	℃/ W
Thermal resistance, junction – case**	$R_{\theta JC}$	0.22	

Notes:
* : Pulse width ≤ 300 μs, duty cycle ≤ 2 %
** : Surface Mounted on minimum footprint pad area
*** : Limited by bonding wire

电性能参数 / Electrical Characteristics(T_A=25℃)

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=250uA, V_{GS}=0V	60			V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS}=48V, 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		4	V
Static Drain-Source On-Resistance	$R_{DS(ON)}$	V_{GS}=10V, I_D=80A		0.38	0.5	mΩ
		V_{GS}=6V, I_D=80A		0.66	0.9	mΩ
Diode Forward Voltage	V_{SD}	I_S=5A, V_{GS}=0V			1.3	V
Reverse Recovery Time	t_{rr}	I_D = 50 A, V_{DS} =30 V dI$_{SD}$/dt = 100 A/μs		71.9		nS
Reverse Recovery Charge	Q_{rr}			126		nC
Gate resistance	R_g	V_{DS}=0V, V_{GS}=0V f=1.0MHz		2.5		Ω
Input Capacitance	C_{iss}	V_{DS}=30V V_{GS}=0V f=1.0MHz		16790		pF
Output Capacitance	C_{oss}			6410		
Reverse Transfer Capacitance	C_{rss}			1560		

电性能参数 / Electrical Characteristics(T_A=25℃)

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
Total Gate Charge	Q_g	V_{GS}=10V, V_{DS}=30V I_{DS}=50A		280		nC
Gate Source Charge	Q_{gs}			56.2		
Gate Drain Charge	Q_{gd}			77.2		
Turn-On Delay Time	$t_{d(on)}$	V_{GS}=10V V_{DS}=30V R_G=3Ω I_D=50A		42.1		ns
Turn-On Rise Time	t_r			195		
Turn-Off Delay Time	$t_{d(off)}$			177		
Turn-Off Fall Time	t_f			125		

电参数曲线图 / Electrical Characteristic Curve

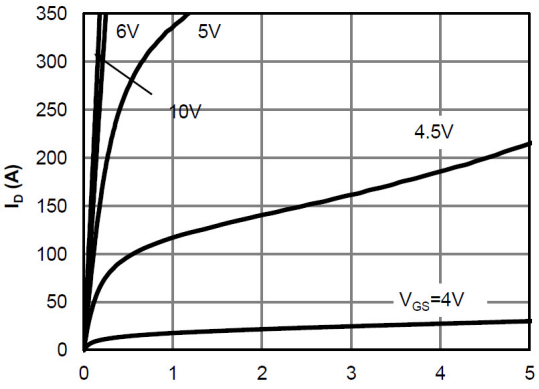


Figure 1: On-Region Characteristics

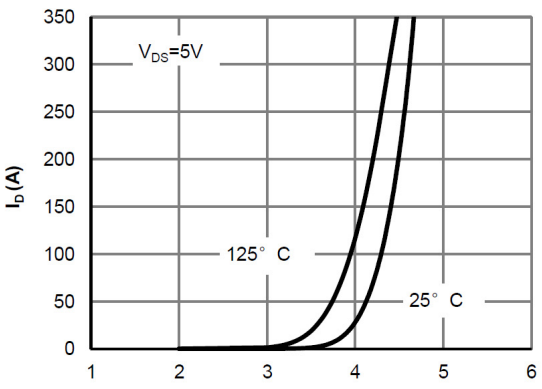


Figure 2: Transfer Characteristics

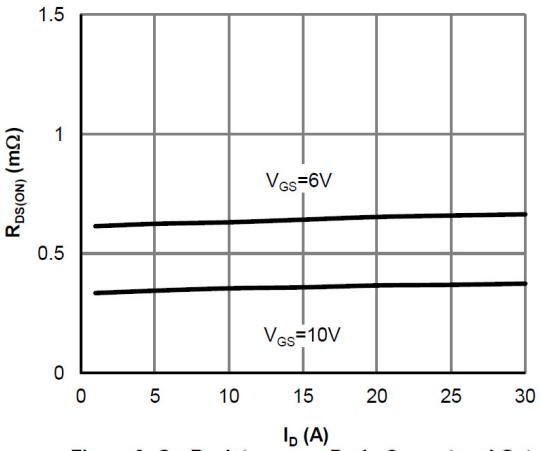


Figure 3: On-Resistance vs. Drain Current and Gate Voltage

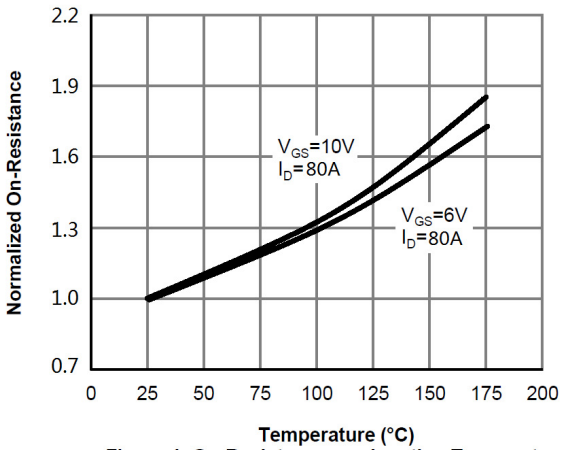


Figure 4: On-Resistance vs. Junction Temperature

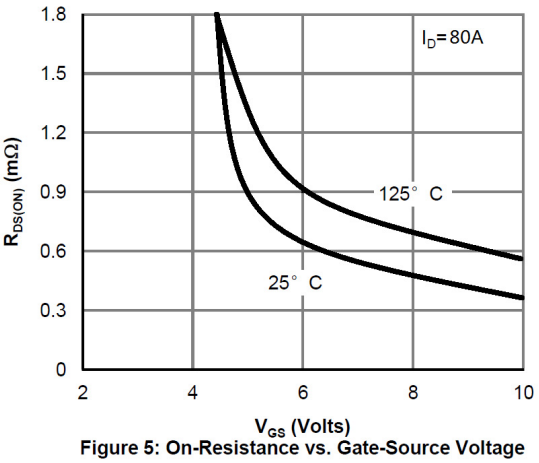


Figure 5: On-Resistance vs. Gate-Source Voltage

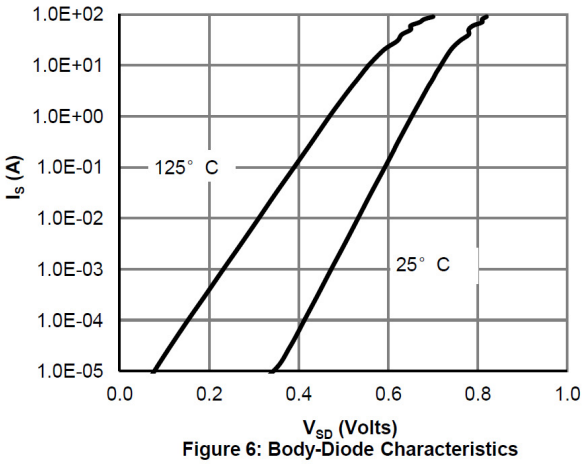


Figure 6: Body-Diode Characteristics

电参数曲线图 / Electrical Characteristic Curve

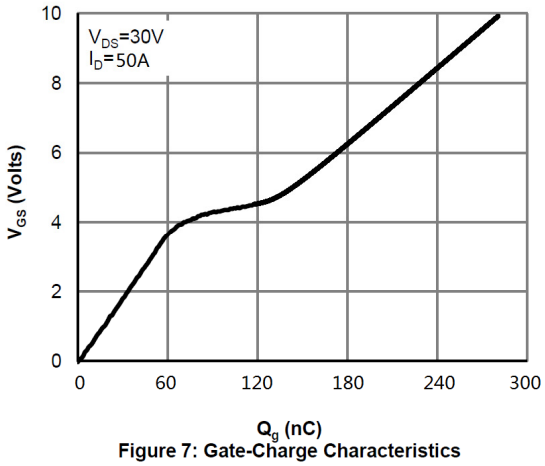


Figure 7: Gate-Charge Characteristics

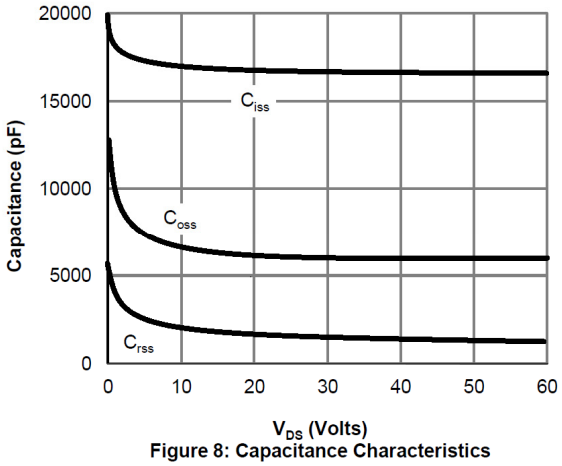


Figure 8: Capacitance Characteristics

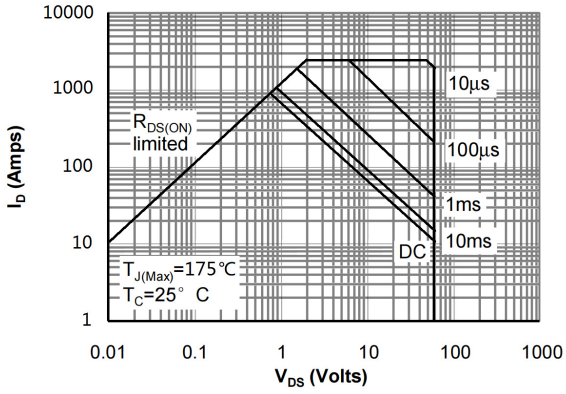


Figure 9: Maximum Forward Biased Safe Operating Area

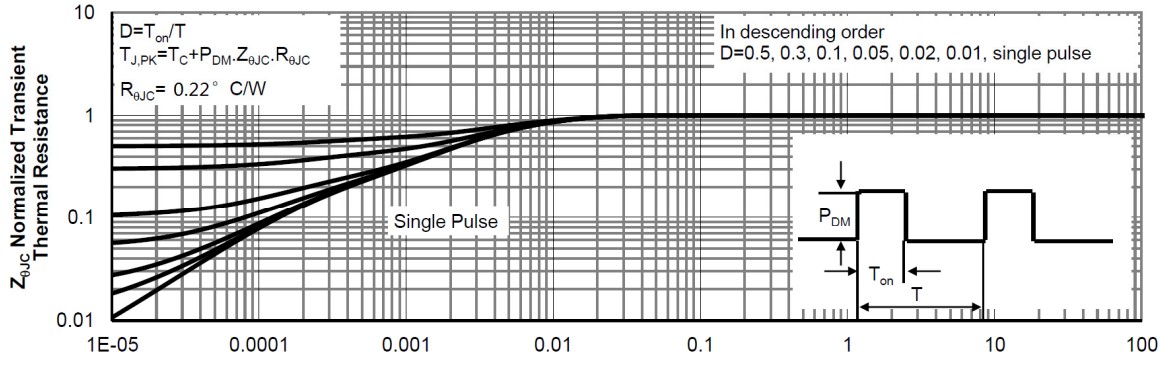
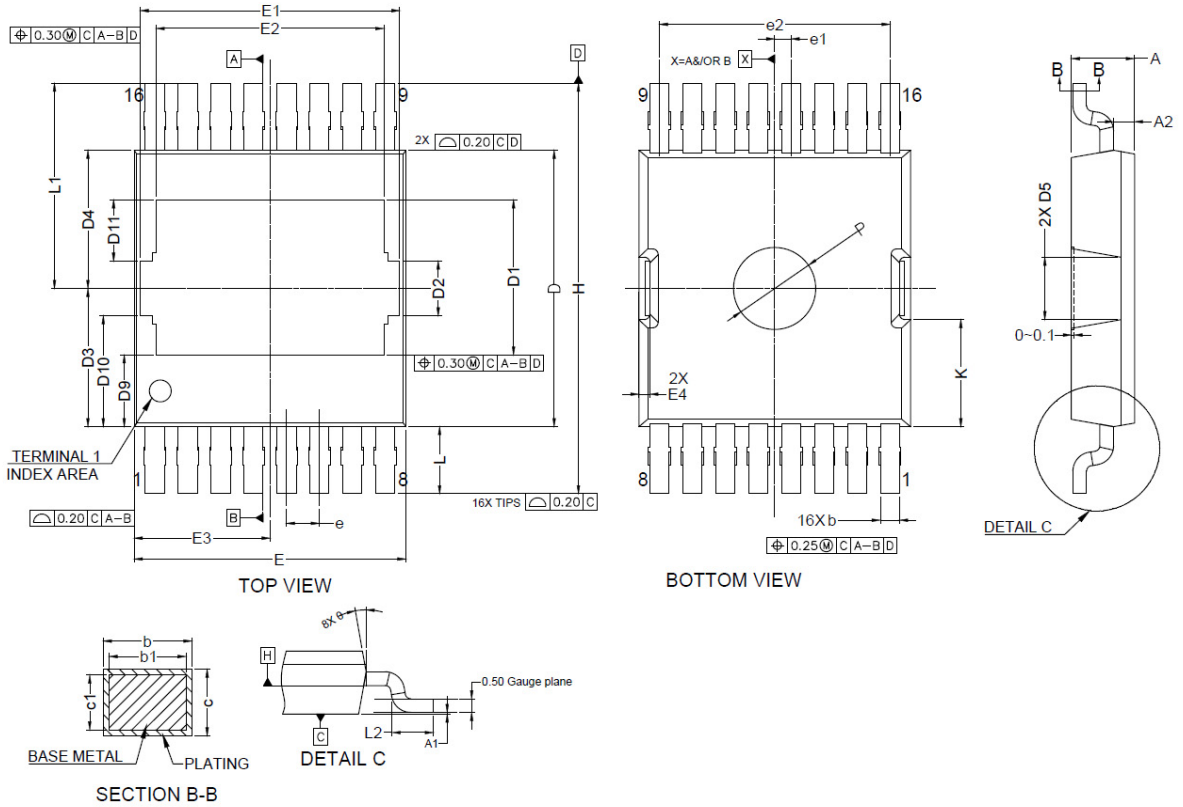


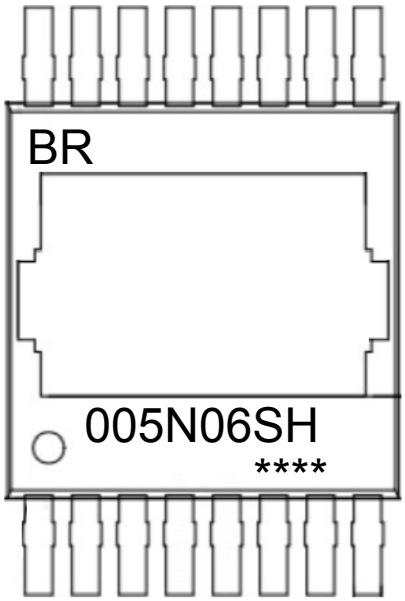
Figure 10: Normalized Maximum Transient Thermal Impedance

外形尺寸图 / Package Dimensions



Symbol	Dimensions In Millmeters		Symbol	Dimensions In Millmeters	
	Min	Max		Min	Max
A	2.20	2.35	E	9.70	10.10
A1	0.01	0.11	E1	9.26	9.66
A2	0.56	0.96	E2	8.10	8.50
b	0.60	0.85	E3	4.75	5.15
b1	0.60	0.80	E4	0.20	0.60
c	0.45	0.65	e	1.20 BSC	
c1	0.45	0.60	e1	0.60 BSC	
D	10.00	10.30	e2	8.40 BSC	
D1	5.47	5.87	H	14.80	15.20
D2	1.80	2.20	K	3.71	4.11
D3	4.85	5.25	L	2.25	2.65
D4	5.00	5.13	L1	7.30	7.70
D5	2.08	2.48	L2	1.30	1.70
D9	2.42	2.82	R	0.07	-
D10	3.85	4.25	P	2.90	3.10
D11	2.04	2.44	θ	4°	10°

印章说明 / Marking Instructions



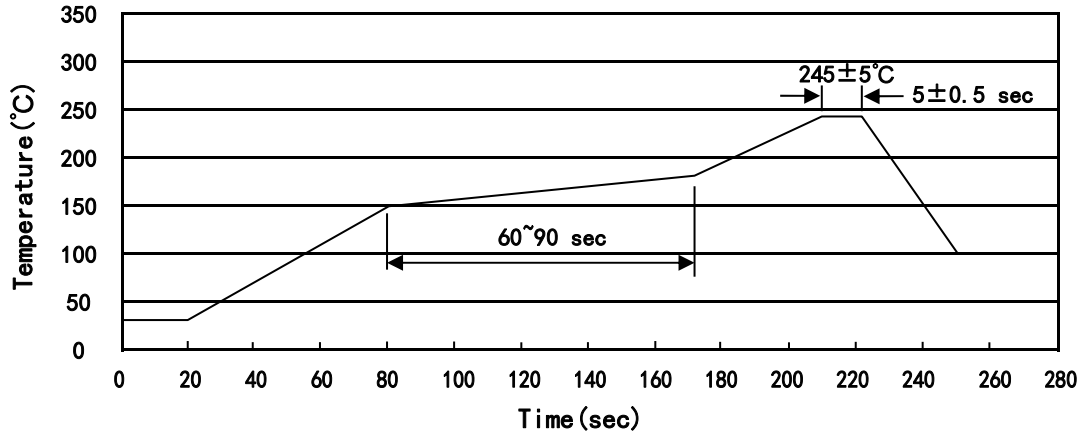
说明：

BR：	为公司代码
005N06SH：	为型号代码
****：	为生产批号代码，随生产批号变化

Note:

BR:	Company Code
005N06SH:	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℃，时间 60～90sec;

2、峰值温度 245±5℃，时间持续为 5±0.5sec;

3、焊接制程冷却速度为 2～10℃/sec.

Note:

1.Preheating:150~180℃, Time:60~90sec.

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

3. Cooling Speed: 2~10℃/sec.

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

温度：260±5℃ 时间：10±1 sec. Temp.:260±5℃ 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：mm³)		
	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
TOLT-16L	1,300	1	1,300	4	5,200	13"×24	357×340×41	377×357×180

使用说明 / Notices

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