

BRCS250C03MFQ

Rev.A Oct.-2024

描述 / Descriptions

SOT23-6 塑封封装互补增强模式场效应管。

Complementary Enhancement MOSFET in a SOT23-6 Plastic Package.

特征 / Features

N-channel

VDS(V)=30V

ID=5.5A

R_{DS(ON)}@10V<25mΩ (TYP. 21.5mR)

R_{DS(ON)}@4.5V<35mΩ (TYP. 23mR)

R_{DS(ON)}@2.5V<50(TYP. 30mR)

符合 AEC-Q101 标准高可靠性要求，无卤产品。

Qualified to AEC-Q101 Standards for High Reliability, HF Product.

P-channel

VDS(V)=-30V

ID=-4.0A

R_{DS(ON)}@-10V<55mΩ (TYP. 46mR)

R_{DS(ON)}@-4.5V<65mΩ (TYP. 53mR)

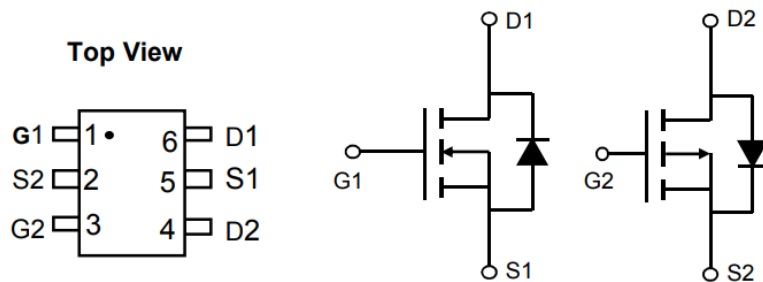
R_{DS(ON)}@-2.5V<120mΩ (TYP. 70mR)

用途 / Applications

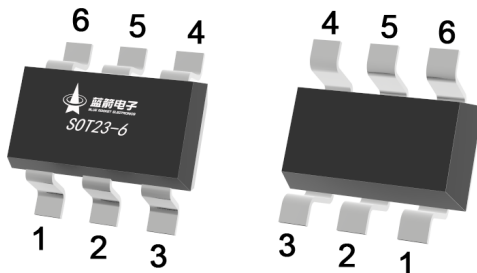
用于电源管理，便携式设备和电池供电系统，满足汽车应用的严格要求。

Power Management in Notebook computer, Portable Equipment and Battery powered systems, Meet the stringent requirements of automotive applications.

内部等效电路 / Equivalent Circuit



引脚排列 / Pinning



PIN 1 : G1 PIN 2 : S2 PIN 3 : G2

PIN 4 : D2 PIN 5 : S1 PIN 6 : D1

印章代码 / Marking

见印章说明。

See Marking Instructions.

极限参数 / Absolute Maximum Ratings(Ta=25°C)

参数 Parameter	符号 Symbol	数值 Rating		单位 Unit
		N-CHANNE	P-CHANNE	
Drain-Source Voltage	V_{DSS}	30	-30	V
Gate-Source Voltage	V_{GSS}	±12		V
Continuous Drain Current	$I_D (T_C=25^\circ C)$	5.5	-4.0	A
Pulsed Drain Current	I_{DM}	35	-25	A
Power Dissipation	$P_D (T_C=25^\circ C)$	1.3	1.3	W
Junction and Storage Temperature Range	T_J, T_{STG}	-55 to +150		°C
Maximum Junction-to-Ambient	$R_{\theta JA}$	140		°C/W
Maximum Junction-to-Lead	$R_{\theta JL}$	75		°C/W

N-沟道电性能参数/N-CHANNEL 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
Drain-Source Breakdown Voltage	BV_{DSS}	$V_{GS}=0V$	$I_D=250\mu A$	30	32.6		V
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS}=30V$	$V_{GS}=0V$			1.0	μA
Gate-Body leakage current	I_{GSS}	$V_{GS}=\pm 12V$	$V_{DS}=0V$			±100	nA
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}$	$I_D=250\mu A$	0.5	0.9	1.5	V
Static Drain-Source On-Resistance	$R_{DS(on)}$	$V_{GS}=10V$	$I_D=4A$		21.5	25	mΩ
		$V_{GS}=4.5V$	$I_D=4A$		23	35	mΩ
		$V_{GS}=2.5V$	$I_D=1A$		30	50	mΩ
Diode Forward Voltage	V_{SD}	$V_{GS}=0V$	$I_S=1A$		0.74	1.2	V
Input Capacitance	C_{iss}				690		pF
Output Capacitance	C_{oss}	$V_{DS}=25V$	$V_{GS}=0V$		200		pF
Reverse Transfer Capacitance	C_{rss}	$f=1.0MHz$			130		pF
Gate resistance	R_g	$V_{DS}=0V$	$V_{GS}=0V$		3.5		Ω
		$f=1.0MHz$					
Total Gate Charge	$Q_{g(10V)}$				4.1		nC
Total Gate Charge	$Q_{g(4.5V)}$	$V_{GS}=10V$	$V_{DS}=15V$		2.2		nC
Gate-Source Charge	Q_{gs}	$I_D=3.5A$			0.6		nC
Gate-Drain Charge	Q_{gd}				1.1		nC
Turn-On Delay Time	$t_{d(on)}$				4.6		ns
Turn-On Rise Time	t_r	$V_{DS}=15V$	$V_{GS}=10V$		1.4		ns
Turn-Off Delay Time	$t_{d(off)}$	$R_L=4.2\Omega$	$R_{GEN}=3\Omega$		18.7		ns
Turn-Off Fall Time	t_f				15.8		ns

N-沟道电参数曲线图 / N-CHANNEL Electrical Characteristic Curve

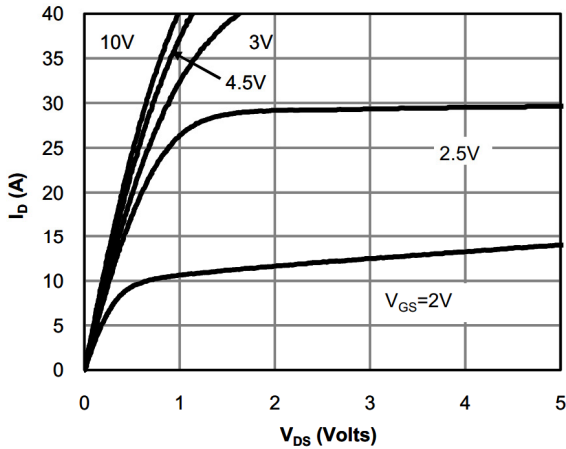


Fig 1: On-Region Characteristics

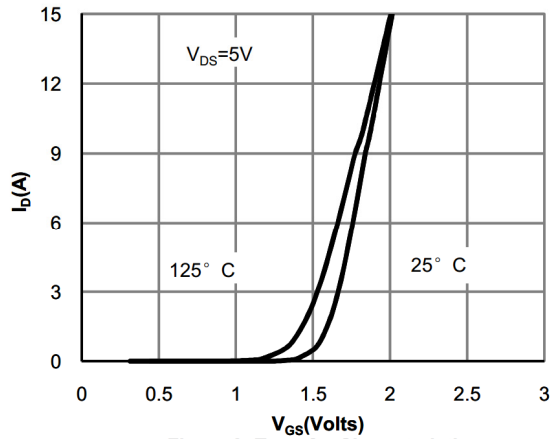


Figure 2: Transfer Characteristics

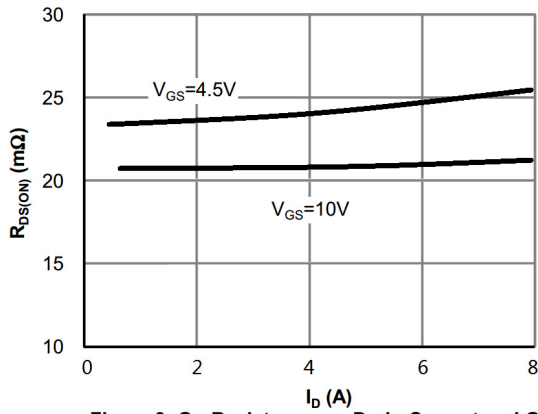


Figure 3: On-Resistance vs. Drain Current and Gate Voltage

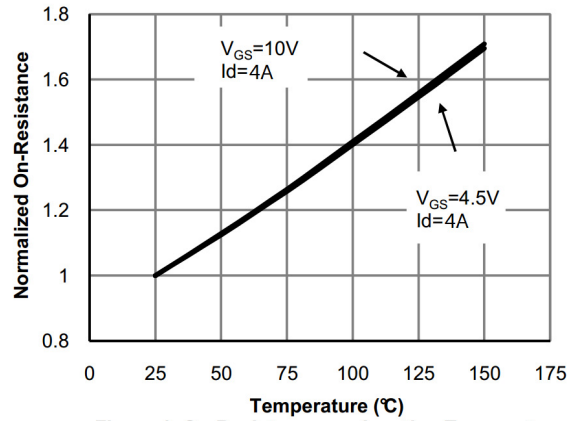


Figure 4: On-Resistance vs. Junction Temperature

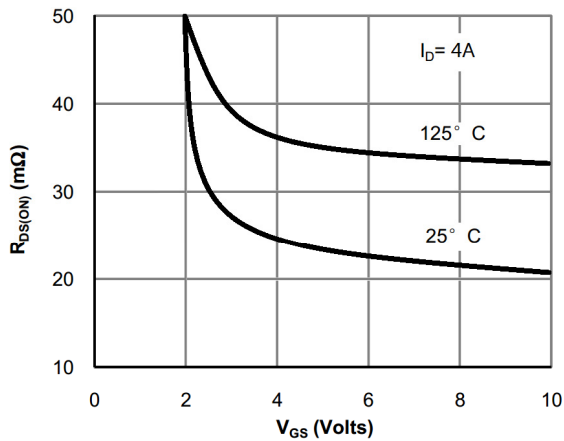


Figure 5: On-Resistance vs. Gate-Source Voltage

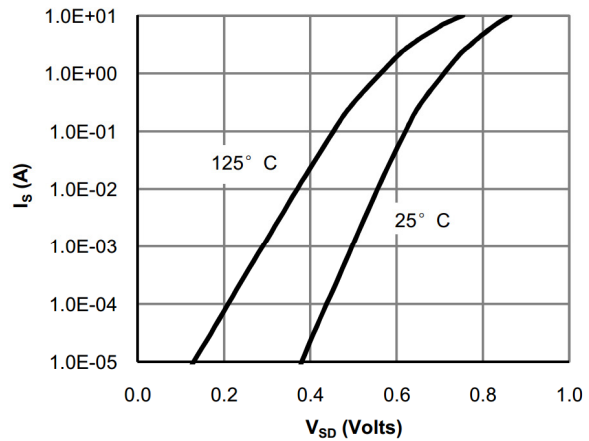
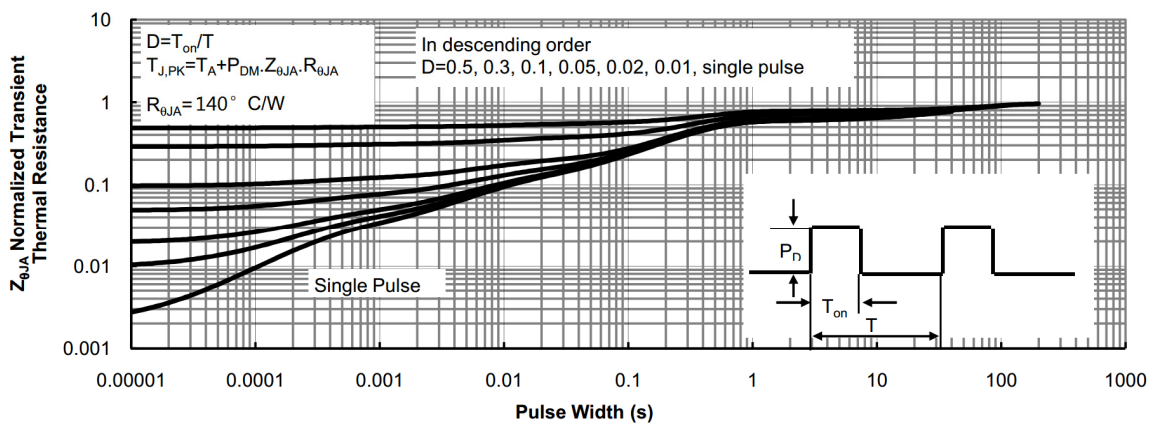
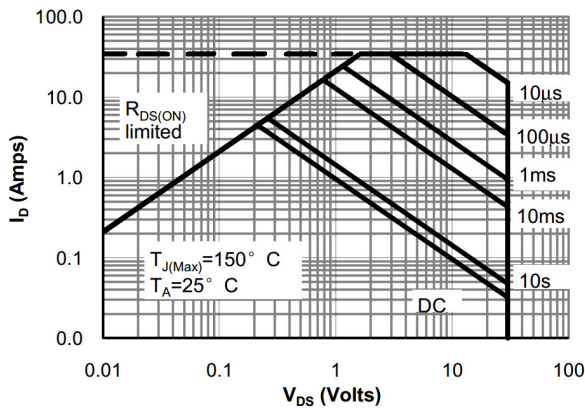
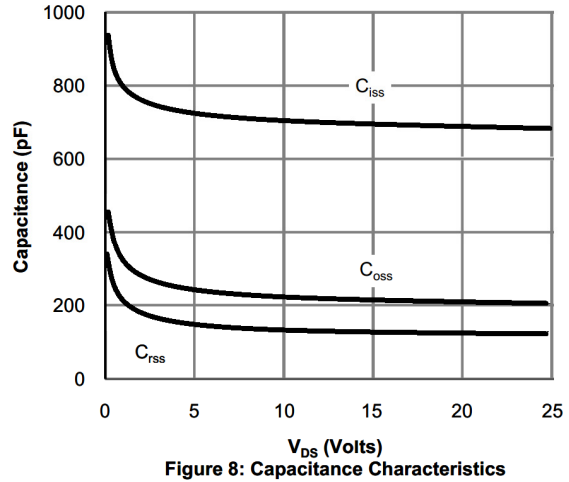
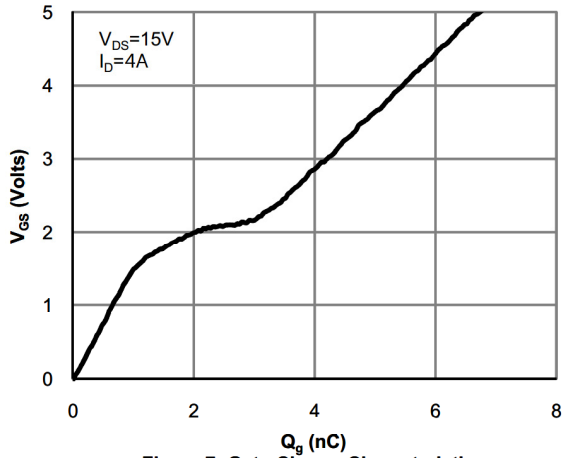


Figure 6: Body-Diode Characteristics

N-沟道电参数曲线图 / N-CHANNEL Electrical Characteristic Curve



P-沟道电性能参数/P-CHANNEL 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
Drain-Source Breakdown Voltage	BV _{DSS}	V _{GS} =0V I _D =-250μA	-30	-32		V
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} =-30V V _{GS} =0V			-1.0	μA
Gate-Body leakage current	I _{GSS}	V _{GS} =±12V V _{DS} =0V			±100	nA
Gate Threshold Voltage	V _{GS(th)}	V _{DS} =V _{GS} I _D =-250μA	-0.5	-0.9	-1.5	V
Static Drain-Source On-Resistance	R _{DS(on)}	V _{GS} =-10V I _D =-4A		46	55	mΩ
		V _{GS} =-4.5V I _D =-4A		53	65	mΩ
		V _{GS} =-2.5V I _D =-1A		70	120	mΩ
Diode Forward Voltage	V _{SD}	V _{GS} =0V I _S =-1A		-0.76	-1.2	V
Input Capacitance	C _{iss}	V _{DS} =-25V V _{GS} =0V f=1.0MHz		900		pF
Output Capacitance	C _{oss}			240		pF
Reverse Transfer Capacitance	C _{rss}			190		pF
Gate resistance	R _g	V _{DS} =0V V _{GS} =0V f=1.0MHz		4.5		Ω
Total Gate Charge	Q _{g(10V)}	V _{GS} =-10V V _{DS} =-15V I _D =-2.7A		4.4		nC
Total Gate Charge	Q _{g(4.5V)}			2.3		nC
Gate-Source Charge	Q _{gs}			0.75		nC
Gate-Drain Charge	Q _{gd}			1.2		nC
Turn-On Delay Time	t _{d(on)}	V _{DS} =-15V V _{GS} =-10V R _L =5.55Ω R _{GEN} =3Ω		7.8		ns
Turn-On Rise Time	t _r			4.3		ns
Turn-Off Delay Time	t _{d(off)}			11.5		ns
Turn-Off Fall Time	t _f			3.7		ns

P-沟道电参数曲线图 / P-CHANNEL Electrical Characteristic Curve

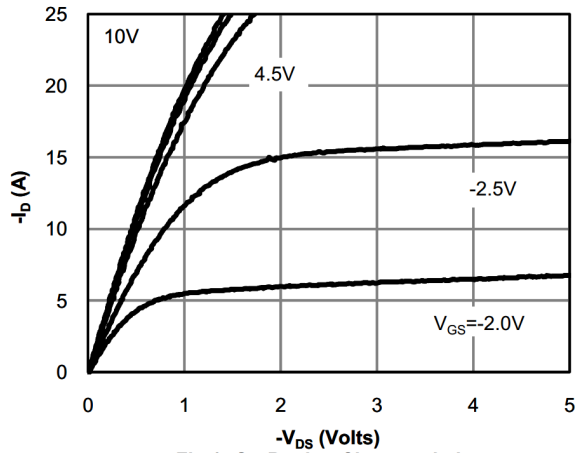


Fig 1: On-Region Characteristics

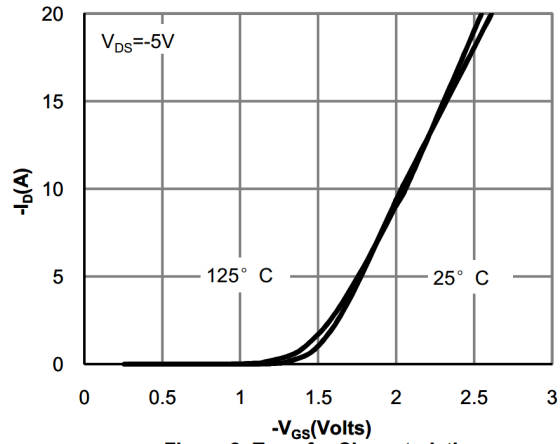


Figure 2: Transfer Characteristics

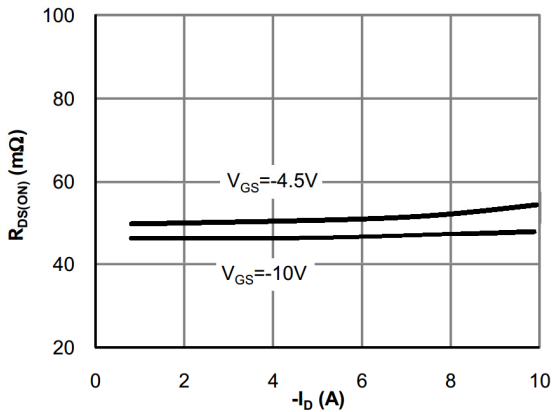


Figure 3: On-Resistance vs. Drain Current and Gate Voltage

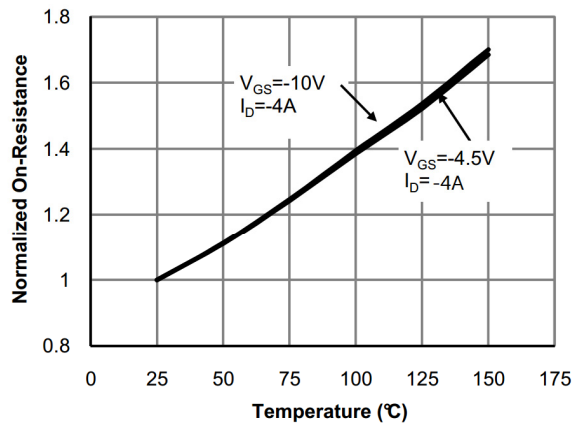


Figure 4: On-Resistance vs. Junction Temperature

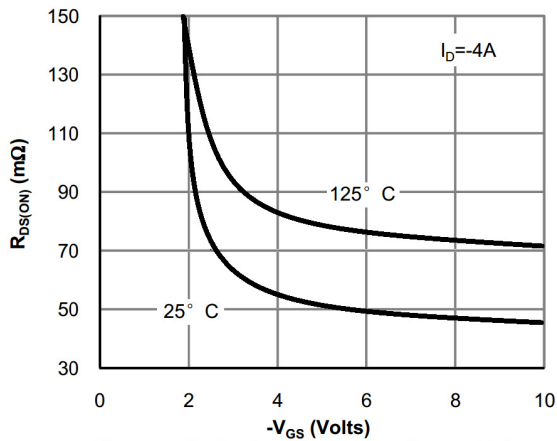


Figure 5: On-Resistance vs. Gate-Source Voltage

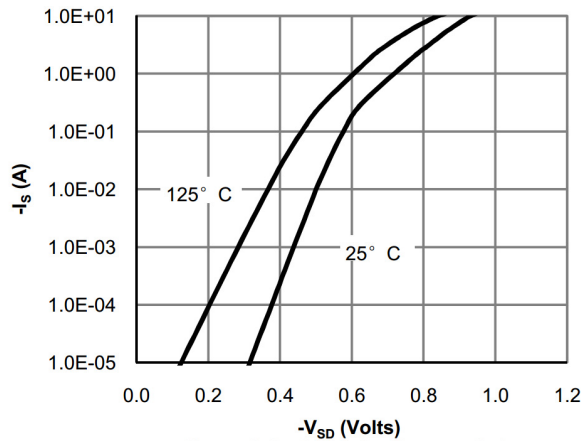


Figure 6: Body-Diode Characteristics

P-沟道电参数曲线图 / P-CHANNEL Electrical Characteristic Curve

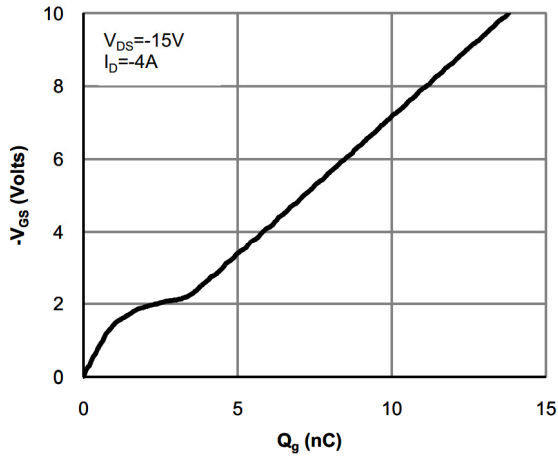


Figure 7: Gate-Charge Characteristics

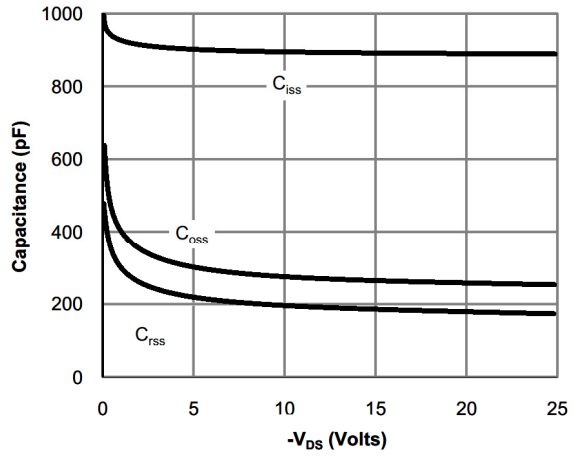


Figure 8: Capacitance Characteristics

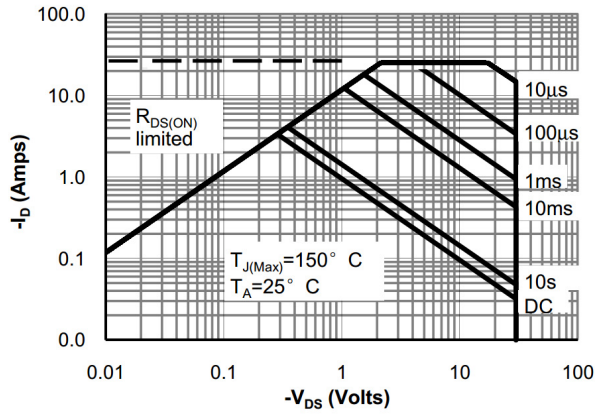


Figure 9: Maximum Forward Biased Safe Operating Area

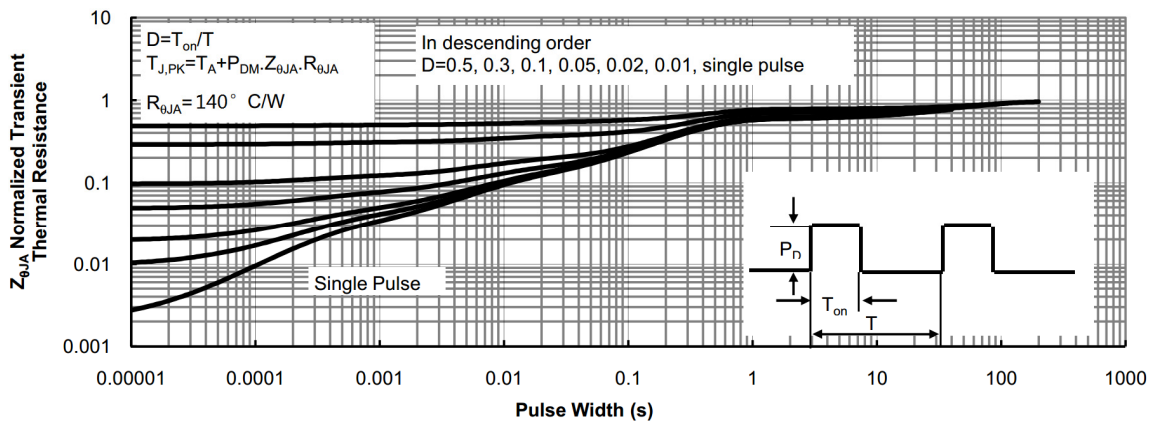
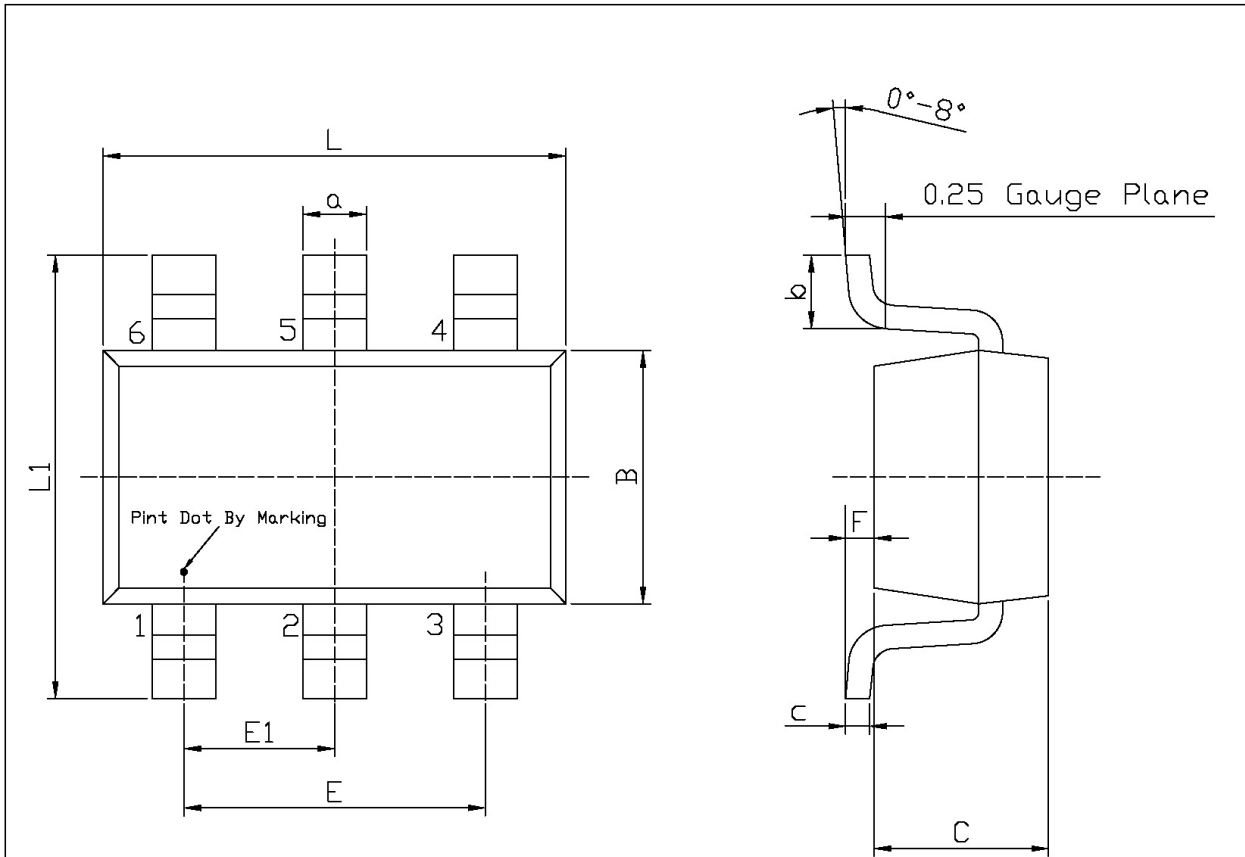


Figure 10: Normalized Maximum Transient Thermal Impedance

外形尺寸图 / Package Dimensions

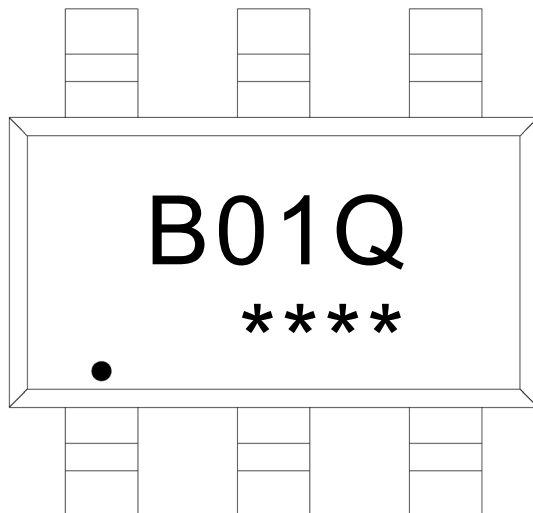


Unit: mm

Symbol	Dimensions In Millimeters		Symbol	Dimensions In Millimeters	
	Min	Max		Min	Max
L	2.82	3.02	E1	0.85	1.05
B	1.50	1.70	a	0.35	0.50
C	0.90	1.30	c	0.10	0.20
L1	2.60	3.00	b	0.35	0.55
E	1.80	2.00	F	0	0.15

SOT23-6

印章说明 / Marking Instructions



说明：

B01: 为型号代码

Q: 为汽车无卤产品标识

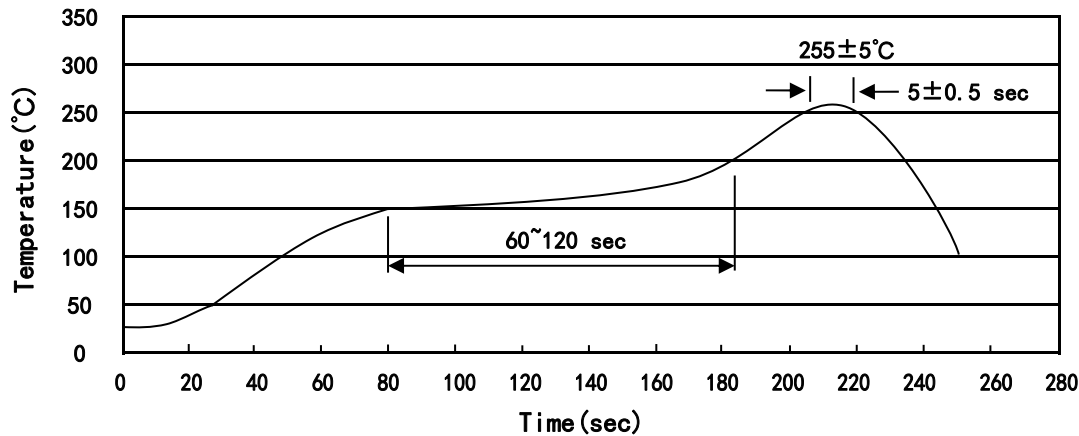
****: 为生产批号代码，随生产批号变化

Note:

B01 : Product Type Code

Q: Automobile halogen-free product 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 150~200°C，时间 60~120sec;
- 2、峰值温度 255±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:150~200°C, Time:60~120sec.
- 2.Peak Temp.:255±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 ³)		
	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
SOT23-5/6	3,000	10	30,000	4	120,000	7" ×8	210×205×205	445×435×230

使用说明 / Notices