

**描述 / Descriptions**

SOP-8 塑封封装互补增强模式 MOS 场效应管。

Complementary Enhancement MOSFET in a SOP-8 Plastic Package.

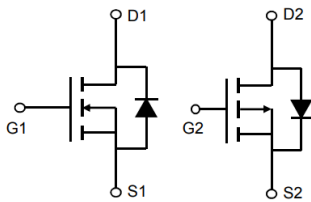
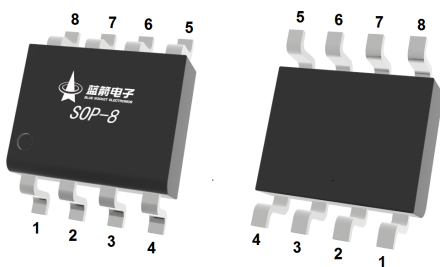
**特征 / Features**

N-channel	P-channel
$V_{DS}(V)=60V$	$V_{DS}(V)=-60V$
$I_D=9.7A$	$I_D=3.4A$
$R_{DS(ON)}<16m\Omega (V_{GS}=10V)$	$R_{DS(ON)}<100m\Omega (V_{GS}=-10V)$
$R_{DS(ON)}<22m\Omega (V_{GS}=4.5V)$	$R_{DS(ON)}<130m\Omega (V_{GS}=-4.5V)$
无卤产品。HF Product.	

**用途 / Applications**

用于高功率 DC/DC 转换和功率开关。适用于作负载开关或脉宽调制应用。

These devices are well suited for high efficiency switching DC/DC converters and switch mode power supplies. And suitable for use as a load switch or in PWM applications.

**内部等效电路 / Equivalent Circuit****引脚排列 / Pinning**

PIN 1 : S1    PIN 2 : G1    PIN 3 : S2    PIN 4 : G2  
 PIN 5 : D2    PIN 6 : D2    PIN 7 : D1    PIN 8 : 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-channel	P-channel		
Drain-Source Voltage	$V_{DSS}$	60	-60	V	
Gate-Source Voltage	$V_{GSS}$	±20		V	
Continuous Drain Current	$I_D (T_A=25^\circ\text{C})$	9.7	-3.4	A	
Pulsed Drain Current	$I_{DM}$	±40		A	
Power Dissipation	$P_D (T_A=25^\circ\text{C})$	2.7	1.9	W	
Maximum Junction-to-Ambient	$R_{\theta JA}$	t≤10s	46.3	65.8	°C/W
		Steady-State	72	100	°C/W
Junction and Storage Temperature Range	$T_J, T_{STG}$	-55 to +150		°C	

## 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	$BV_{DSS}$	$V_{GS}=0V$	$I_D=250\mu A$	60	68		V
Zero Gate Voltage Drain Current	$I_{DSS}$	$V_{DS}=60V$	$V_{GS}=0V$			1.0	$\mu A$
Gate-Body leakage current	$I_{GSS}$	$V_{GS}=\pm 20V$	$V_{DS}=0V$			100	nA
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}$	$I_D=250\mu A$	1.0	1.7	2.5	V
Static Drain-Source On-Resistance	$R_{DS(on)}$	$V_{GS}=10V$	$I_D=10A$		14	16	m $\Omega$
		$V_{GS}=4.5V$	$I_D=10A$		17.5	22	m $\Omega$
Diode Forward Voltage	$V_{SD}$	$V_{GS}=0V$	$I_S=1.0A$			1.2	V
Input Capacitance	$C_{iss}$	$V_{DS}=25V$ $f=1.0MHz$	$V_{GS}=0V$		570		pF
Output Capacitance	$C_{oss}$				310		pF
Reverse Transfer Capacitance	$C_{rss}$				11		pF
Gate resistance	$R_g$	$V_{DS}=0V$ $f=1.0MHz$	$V_{GS}=0V$		1.5		$\Omega$
Total Gate Charge	$Q_{g(10V)}$	$V_{GS}=10V$ $I_D=9.7A$	$V_{DS}=30V$		13.5		nC
Total Gate Charge	$Q_{g(4.5V)}$				6.5		nC
Gate-Source Charge	$Q_{gs}$				2.5		nC
Gate-Drain Charge	$Q_{gd}$				3.0		nC
Turn-On Delay Time	$t_{d(on)}$	$V_{DS}=30V$ $R_L=2.3\Omega$	$V_{GS}=10V$ $R_{GEN}=3\Omega$		5		ns
Turn-On Rise Time	$t_r$				3		ns
Turn-Off Delay Time	$t_{d(off)}$				19		ns
Turn-Off Fall Time	$t_f$				3		ns

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

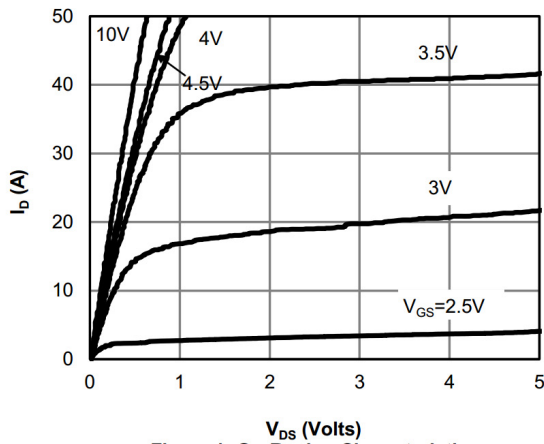


Figure 1: On-Region Characteristics

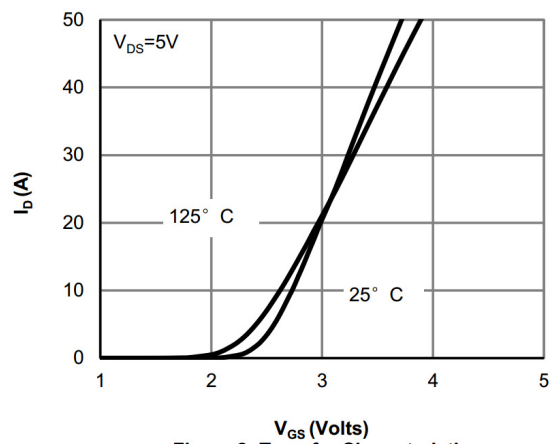


Figure 2: Transfer Characteristics

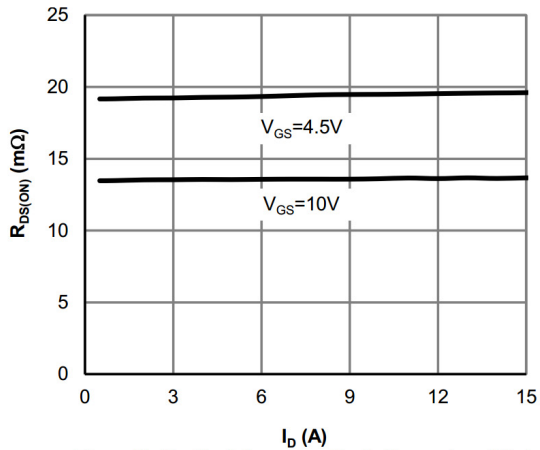


Figure 3: On-Resistance vs. Drain Current and Gate Voltage

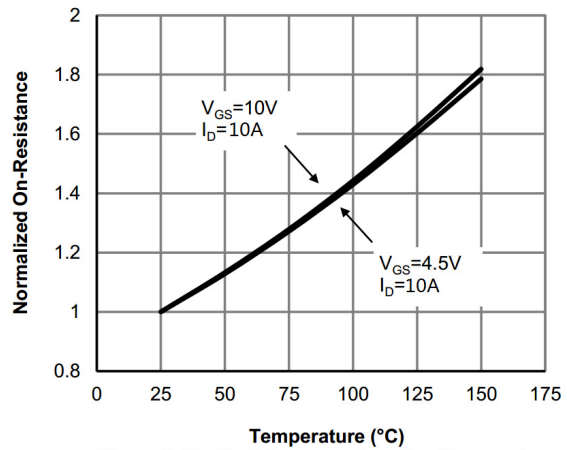


Figure 4: On-Resistance vs. Junction Temperature

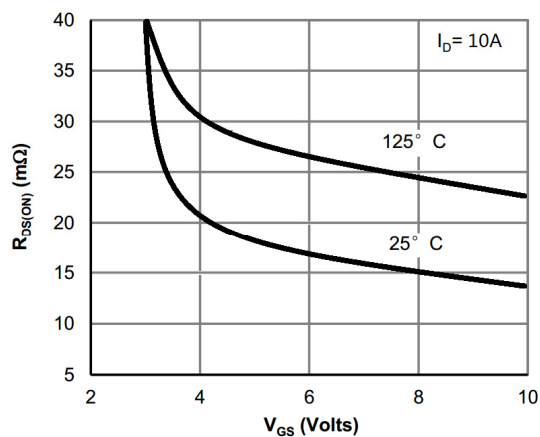


Figure 5: On-Resistance vs. Gate-Source Voltage

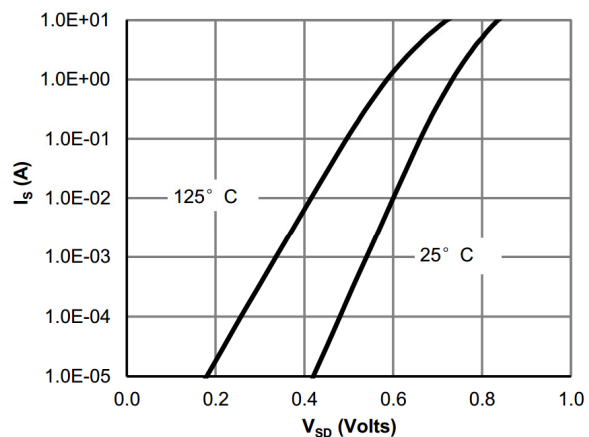


Figure 6: Body-Diode Characteristics

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

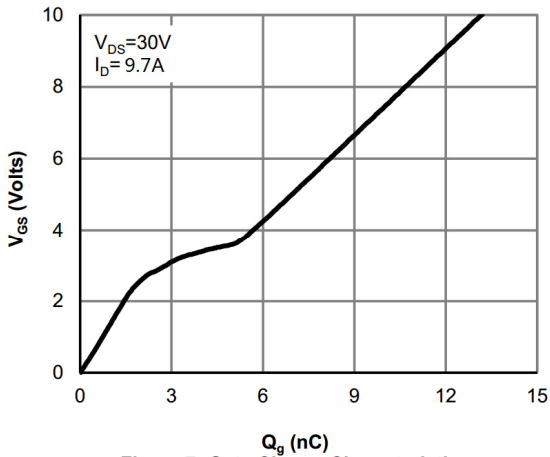


Figure 7: Gate-Charge Characteristics

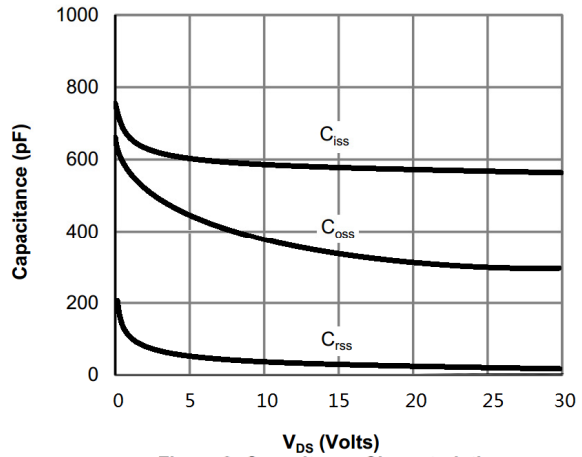


Figure 8: Capacitance Characteristics

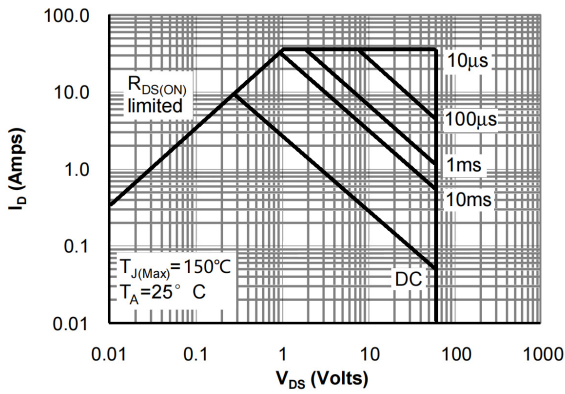


Figure 9: Maximum Forward Biased Safe Operating Area

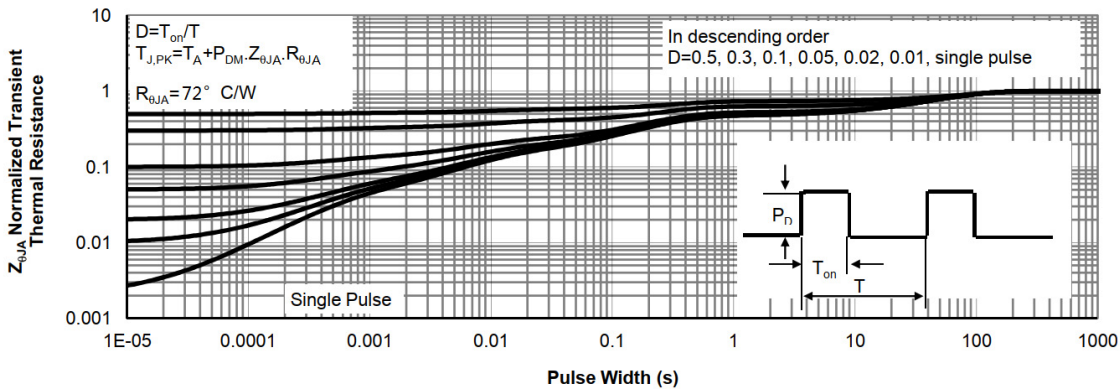


Figure 10: Normalized Maximum Transient Thermal Impedance

## 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	$BV_{DSS}$	$V_{GS}=0V$ $I_D=-250\mu A$	-60	-71		V
Zero Gate Voltage Drain Current	$I_{DSS}$	$V_{DS}=-60V$ $V_{GS}=0V$			-1.0	$\mu A$
Gate-Body leakage current	$I_{GSS}$	$V_{GS}=\pm 20V$ $V_{DS}=0V$			$\pm 100$	nA
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}$ $I_D=-250\mu A$	-1.0	-1.7	-2.5	V
Static Drain-Source On-Resistance	$R_{DS(on)}$	$V_{GS}=-10V$ $I_D=-10A$		87	100	m $\Omega$
		$V_{GS}=-4.5V$ $I_D=-10A$		104	130	m $\Omega$
Diode Forward Voltage	$V_{SD}$	$V_{GS}=0V$ $I_S=-1.0A$			-1.0	V
Input Capacitance	$C_{iss}$	$V_{DS}=-25V$ $V_{GS}=0V$ $f=1.0MHz$		1170		pF
Output Capacitance	$C_{oss}$			60		pF
Reverse Transfer Capacitance	$C_{rss}$			45		pF
Gate resistance	$R_g$	$V_{DS}=0V$ $V_{GS}=0V$ $f=1.0MHz$		5.5		$\Omega$
Total Gate Charge	$Q_{g(-10V)}$	$V_{GS}=-10V$ $V_{DS}=-30V$ $I_D=-3.4A$		12.3		nC
Total Gate Charge	$Q_{g(-4.5V)}$			6.3		nC
Gate-Source Charge	$Q_{gs}$			1.6		nC
Gate-Drain Charge	$Q_{gd}$			2.4		nC
Turn-On Delay Time	$t_{d(on)}$	$V_{DS}=-30V$ $V_{GS}=-10V$ $R_L=5.4\Omega$ $R_{GEN}=3\Omega$		12		ns
Turn-On Rise Time	$t_r$			20		ns
Turn-Off Delay Time	$t_{d(off)}$			20		ns
Turn-Off Fall Time	$t_f$			25		ns

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

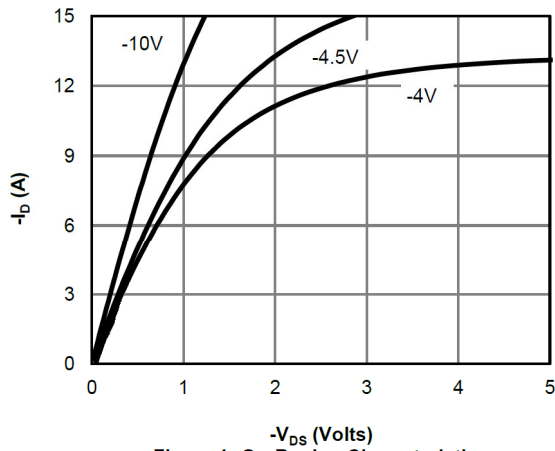


Figure 1: On-Region Characteristics

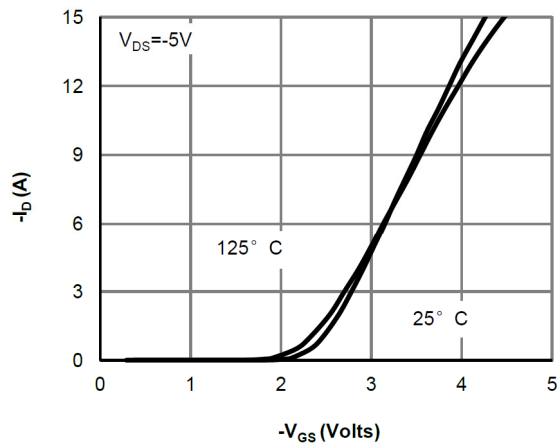


Figure 2: Transfer Characteristics

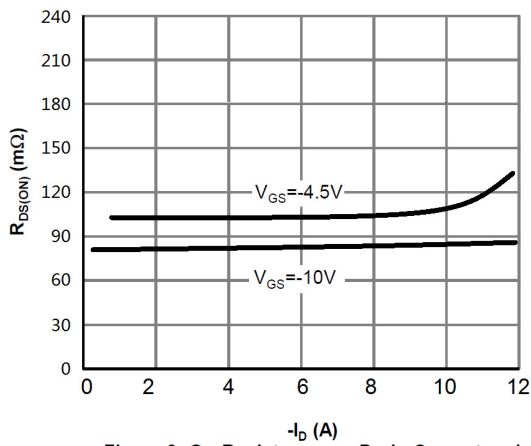


Figure 3: On-Resistance vs. Drain Current and Gate Voltage

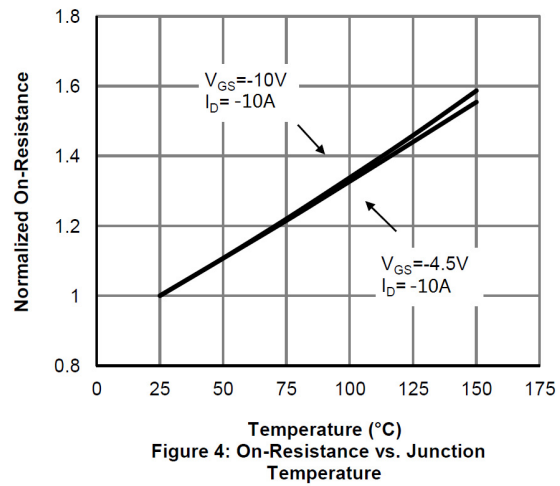


Figure 4: On-Resistance vs. Junction Temperature

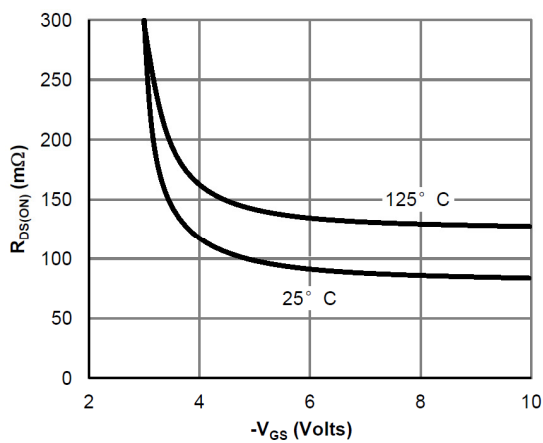


Figure 5: On-Resistance vs. Gate-Source Voltage

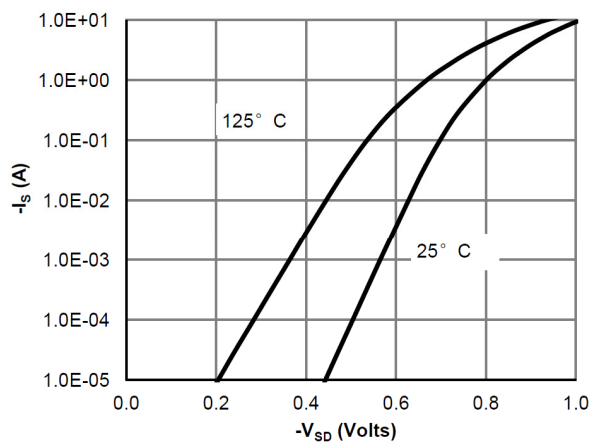
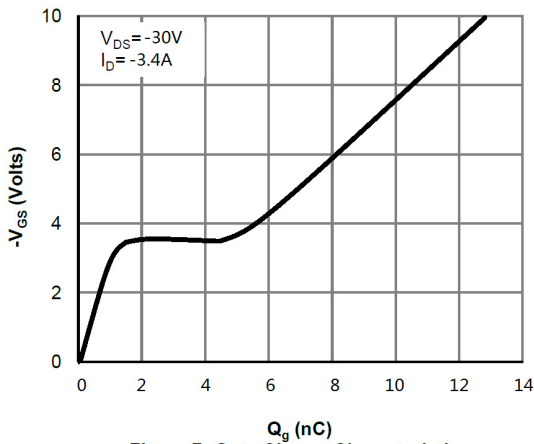
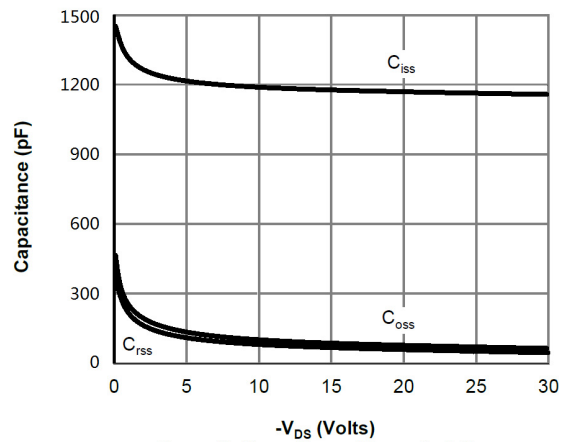


Figure 6: Body-Diode Characteristics

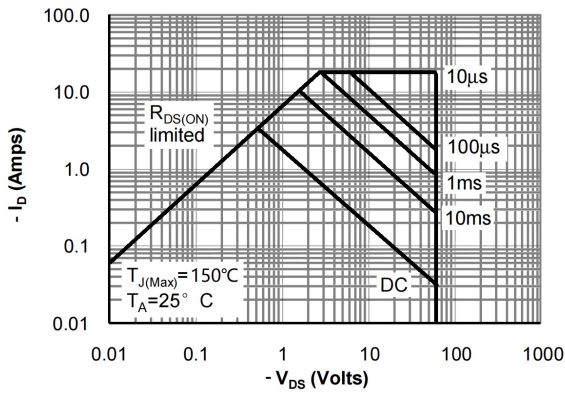
**P-沟道电参数曲线图 / P-CHANNEL Electrical Characteristic Curve**



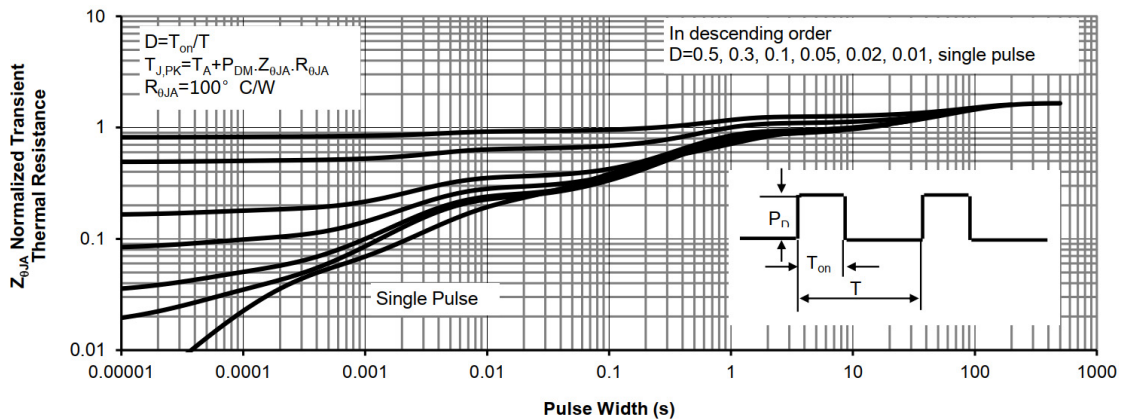
**Figure 7: Gate-Charge Characteristics**



**Figure 8: Capacitance Characteristics**



**Figure 9: Maximum Forward Biased Safe Operating Area**



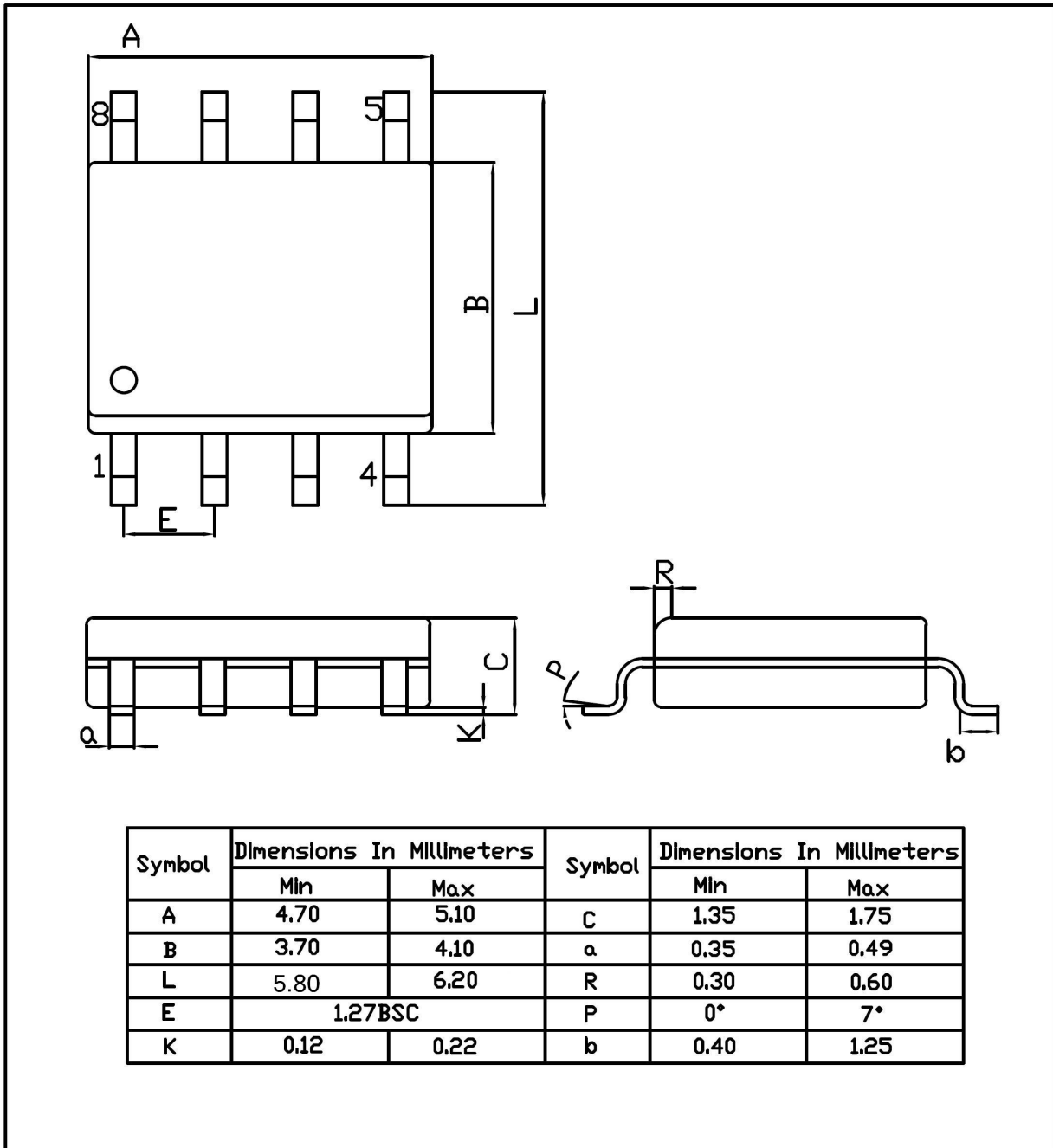
**Figure 10: Normalized Maximum Transient Thermal Impedance**



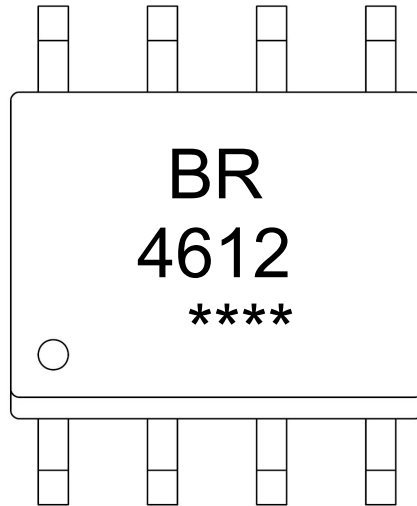
外形尺寸图 / Package Dimensions

SOP-8

Unit:mm



**印章说明 / Marking Instructions**



说明：

BR： 为公司代码

4612： 为型号代码

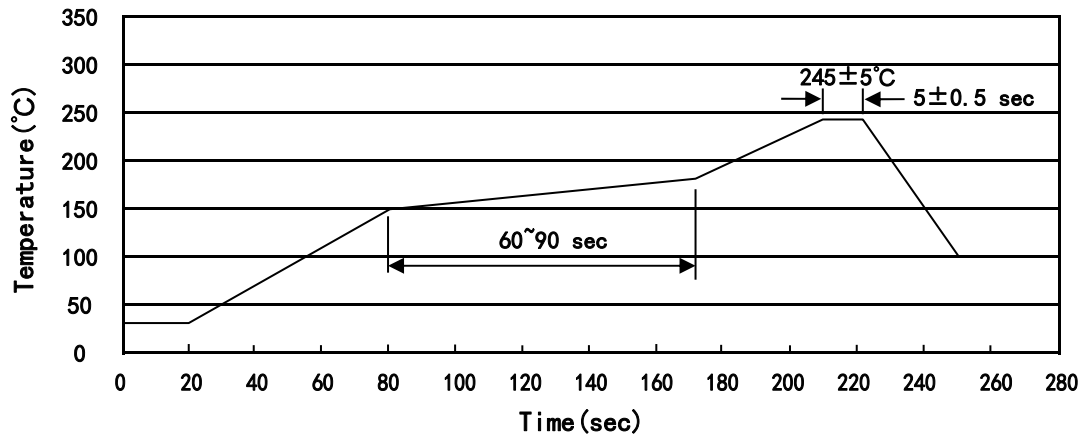
\*\*\*\*： 为生产批号代码，随生产批号变化

Note:

BR: Company Code

4612: 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
SOP/ESOP-8	4,000	2	8,000	6	48,000	13" ×12	360×360×50	380×335×366

**使用说明 / Notices**