

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
$V_{DS}(V)=30V$	$V_{DS}(V)=-30V$
$I_D=6.9A$	$I_D=-6.0A$
$R_{DS(ON)}<32m\Omega (V_{GS}=10V)$	$R_{DS(ON)}<70m\Omega (V_{GS}=-10V)$
$R_{DS(ON)}<40m\Omega (V_{GS}=4.5V)$	$R_{DS(ON)}<90m\Omega (V_{GS}=-4.5V)$

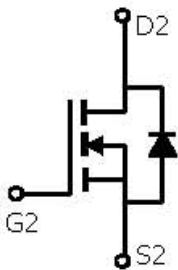
无卤产品。HF Product.

用途 / Applications

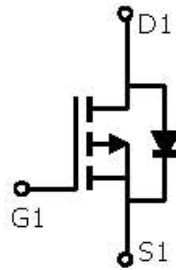
用于高功率 DC/DC 转换和功率开关。适用于作负载开关或脉宽调制应用。

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

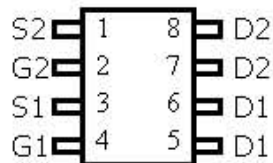
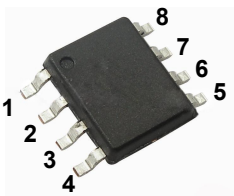


n-channel



p-channel

引脚排列 / Pinning



放大及印章代码 / h_{FE} Classifications & 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}	±30		V
Gate-Source Voltage	V_{GSS}	±20		V
Continuous Drain Current ^A	$I_D (T_A=25^\circ\text{C})$	6.9	-6.0	A
	$I_D (T_A=70^\circ\text{C})$	5.8	-5.0	A
Pulsed Drain Current ^B	I_{DM}	±30		A
Power Dissipation	$P_D (T_A=25^\circ\text{C})$	2		W
	$P_D (T_A=70^\circ\text{C})$	1.44		W
Maximum Junction-to-Ambient ^A	$R_{\theta JA}(t \leq 10s)$	62.5		°C/W
	$R_{\theta JA}$ (Steady-State)	90		°C/W
Maximum Junction-to-Lead ^C	$R_{\theta JL}$ (Steady-State)	40		°C/W
Junction and Storage Temperature Range	T_J, T_{STG}	-55 to +150		°C

Notes:

A: The value of $R_{\theta JA}$ is measured with the device mounted on 1in² FR-4 board with 2oz. Copper, in a still air environment with $T_A = 25^\circ\text{C}$. The value in any a given application depends on the user's specific board design. The current rating is based on the $t \leq 10s$ thermal resistance rating.

B: Repetitive rating, pulse width limited by junction temperature.

C: The $R_{\theta JA}$ is the sum of the thermal impedance from junction to lead $R_{\theta JL}$ and lead to ambient.

D: The static characteristics in Figures 1 to 6,12,14 are obtained using 80 μs pulses, duty cycle 0.5% max.

E: These tests are performed with the device mounted on 1 in² FR-4 board with 2oz. Copper, in a still air environment with $T_A=25^\circ\text{C}$. The SOA curve provides a single pulse rating.

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	33.7		V
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS}=24V$	$V_{GS}=0V$			1.0	μA
		$V_{DS}=24V$	$V_{GS}=0V$			5.0	μA
		$T_J=55^\circ C$					
Gate-Body leakage current	I_{GSS}	$V_{GS}=\pm 20V$	$V_{DS}=0V$			100	nA
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}$	$I_D=250\mu A$	1.1	1.7	2.4	V
Static Drain-Source On-Resistance	$R_{DS(on)}$	$V_{GS}=10V$	$I_D=6.9A$		21.6	32	m Ω
		$V_{GS}=4.5V$	$I_D=5.0A$		31.8	40	m Ω
Diode Forward Voltage	V_{SD}	$V_{GS}=0V$	$I_S=1.0A$		0.78	1.0	V
Input Capacitance	C_{iss}				325		pF
Output Capacitance	C_{oss}	$V_{DS}=25V$	$V_{GS}=0V$		140		pF
		$f=1.0MHz$					
Reverse Transfer Capacitance	C_{rss}				30		pF
Gate resistance	R_g	$V_{DS}=0V$	$V_{GS}=0V$		4.6		Ω
		$f=1.0MHz$					
Total Gate Charge(10V)	Q_g				5.2		nC
Total Gate Charge(4.5V)					2.5		nC
Gate-Source Charge	Q_{gs}	$V_{GS}=10V$	$V_{DS}=15V$		0.8		nC
		$I_D=6A$					
Gate-Drain Charge	Q_{gd}				1.3		nC
Turn-On Delay Time	$t_{d(on)}$				4.5		ns
Turn-On Rise Time	t_r	$V_{DS}=15V$	$V_{GS}=10V$		2.5		ns
		$R_L=2.5\Omega$	$R_{GEN}=3\Omega$				
Turn-Off Delay Time	$t_{d(off)}$				14.5		ns
Turn-Off Fall Time	t_f				3.5		ns

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

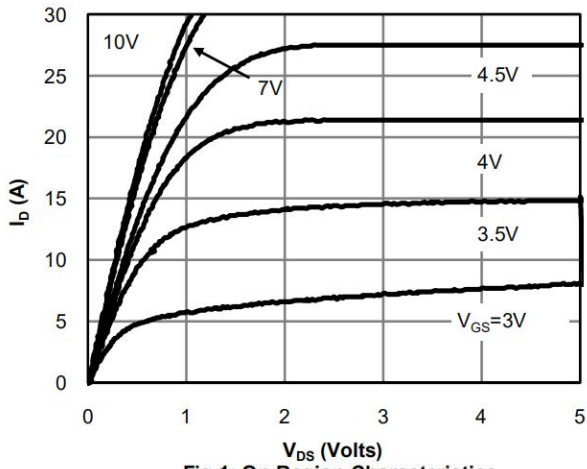


Fig 1: On-Region Characteristics

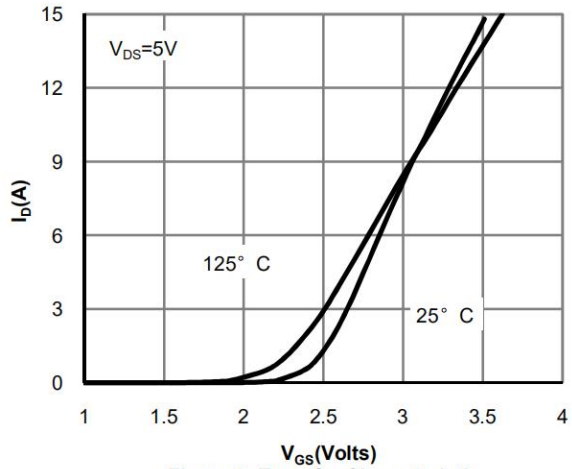


Figure 2: Transfer Characteristics

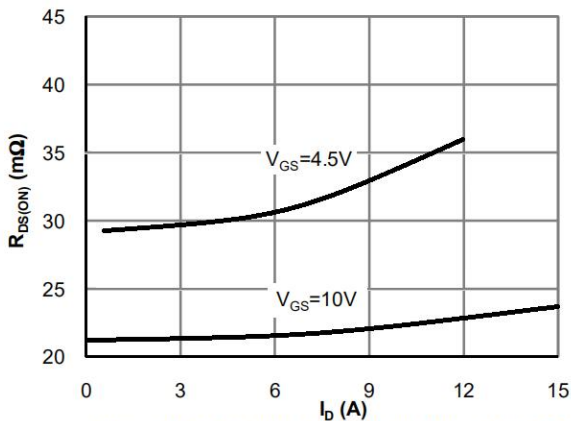


Figure 3: On-Resistance vs. Drain Current and Gate Voltage

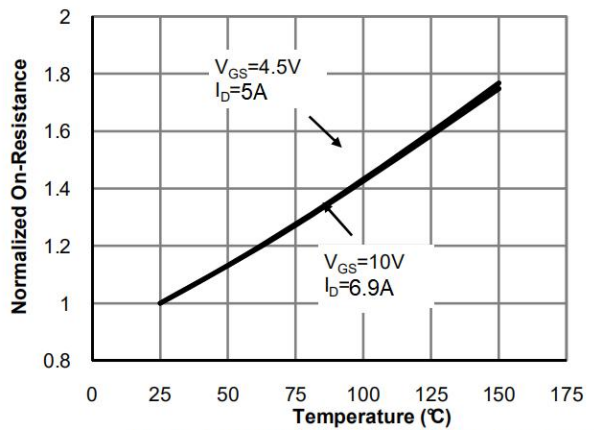


Figure 4: On-Resistance vs. Junction Temperature

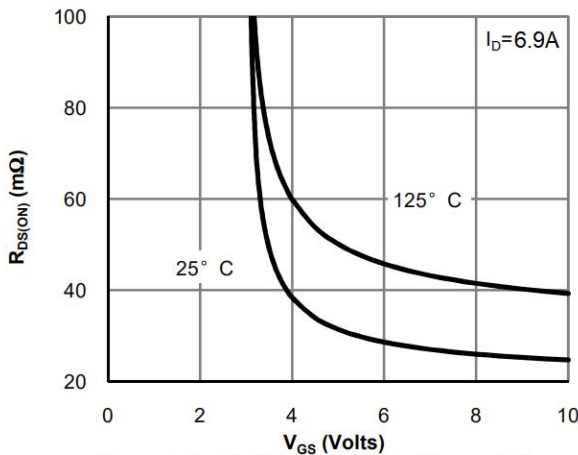


Figure 5: On-Resistance vs. Gate-Source Voltage

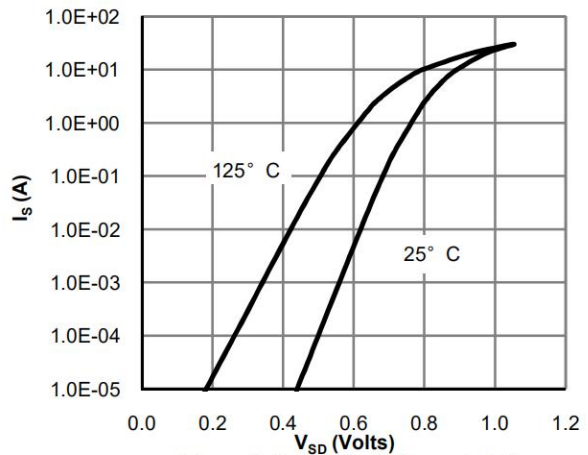


Figure 6: Body-Diode Characteristics

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

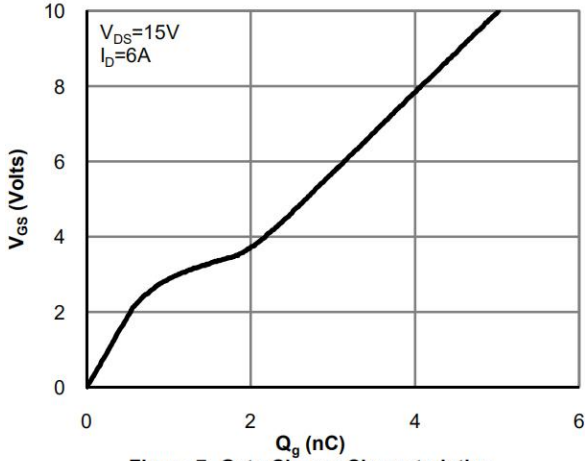


Figure 7: Gate-Charge Characteristics

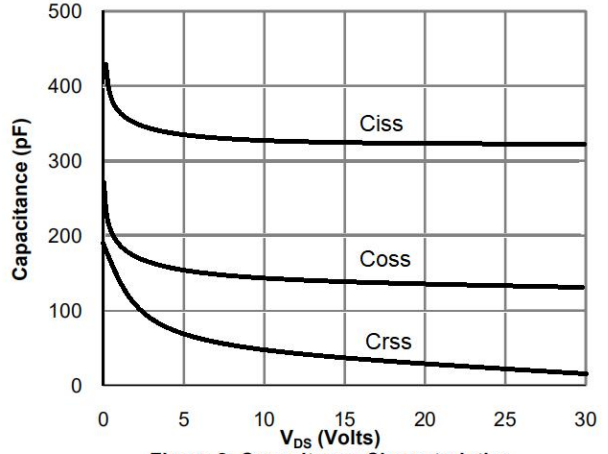


Figure 8: Capacitance Characteristics

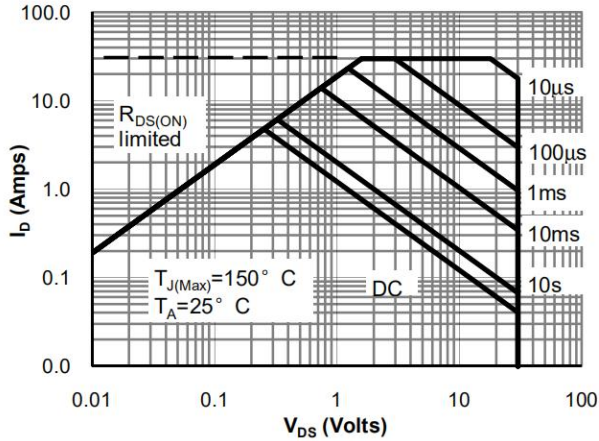


Figure 9: Maximum Forward Biased Safe Operating Area

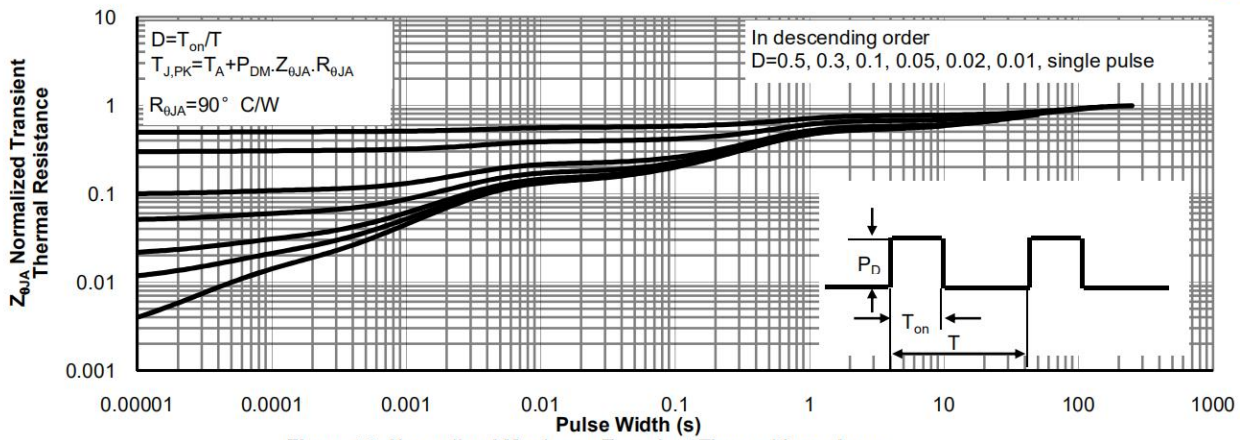


Figure 10: Normalized Maximum Transient Thermal Impedance

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 =-250μA	-30	-33.8		V	
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} =-24V V _{GS} =0V			-1.0	μA	
		V _{DS} =-24V V _{GS} =0V T _J =55°C			-5.0	μA	
Gate-Body leakage current	I _{GSS}	V _{GS} =±20V V _{DS} =0V			±100	nA	
Gate Threshold Voltage	V _{GS(th)}	V _{DS} =V _{GS} I _D =-250μA	-1.3	-1.85	-2.4	V	
Static Drain-Source On-Resistance	R _{DS(on)}	V _{GS} =-10V I _D =-6.0A		50.3	70	mΩ	
		V _{GS} =-4.5V I _D =-5.0A		79.4	90	mΩ	
Diode Forward Voltage	V _{SD}	V _{GS} =0V I _S =-1.0A		-0.81	-1.0	V	
Input Capacitance	C _{iss}	V _{DS} =-25V V _{GS} =0V f=1.0MHz		465		pF	
Output Capacitance	C _{oss}			150		pF	
Reverse Transfer Capacitance	C _{rss}			40		pF	
Gate resistance	R _g	V _{DS} =0V V _{GS} =0V f=1.0MHz		5.5		Ω	
Total Gate Charge(10V)	Q _g	V _{GS} =-10V V _{DS} =-15V I _D =-6.5A		13.6		nC	
Total Gate Charge(4.5V)				6.7		nC	
Gate-Source Charge			Q _{gs}		2.5		nC
Gate-Drain Charge			Q _{gd}		3.2		nC
Turn-On Delay Time	t _{d(on)}	V _{DS} =-15V V _{GS} =-10V R _L =2.3Ω R _{GEN} =3Ω		8		ns	
Turn-On Rise Time	t _r			6		ns	
Turn-Off Delay Time	t _{d(off)}			17		ns	
Turn-Off Fall Time	t _f			5		ns	

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

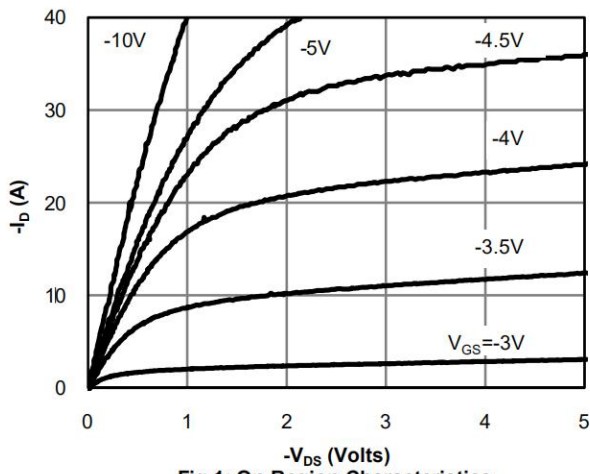


Fig 1: On-Region Characteristics

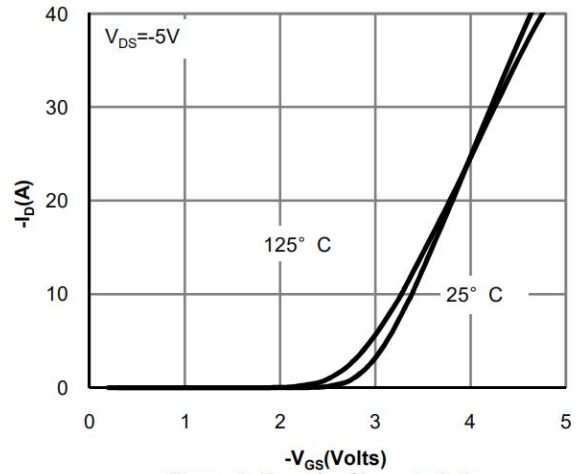


Figure 2: Transfer Characteristics

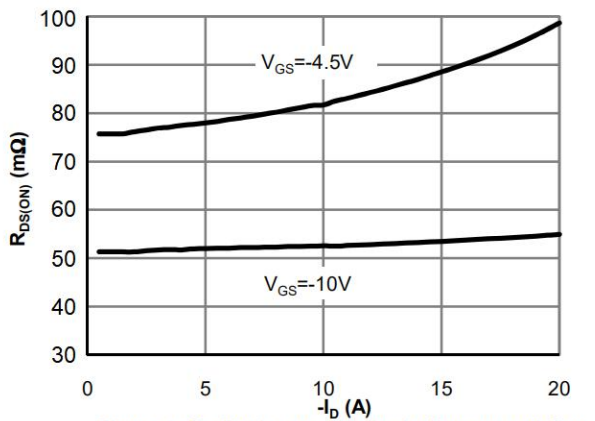


Figure 3: On-Resistance vs. Drain Current and Gate Voltage

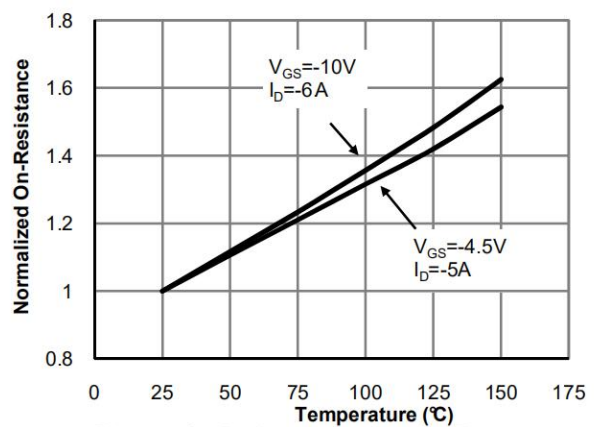


Figure 4: On-Resistance vs. Junction Temperature

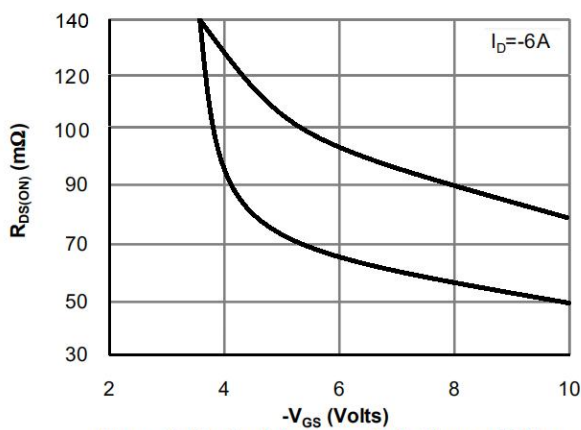


Figure 5: On-Resistance vs. Gate-Source Voltage

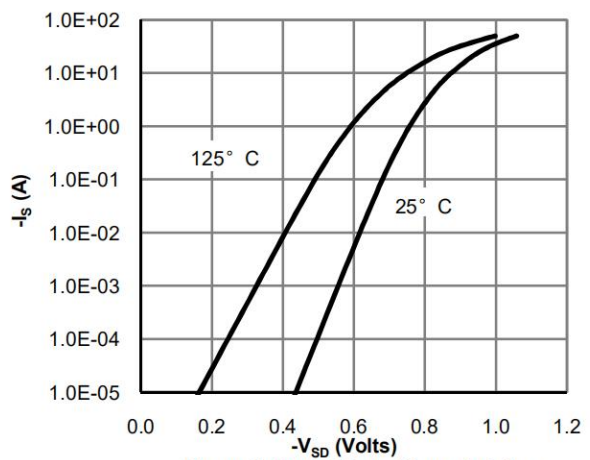
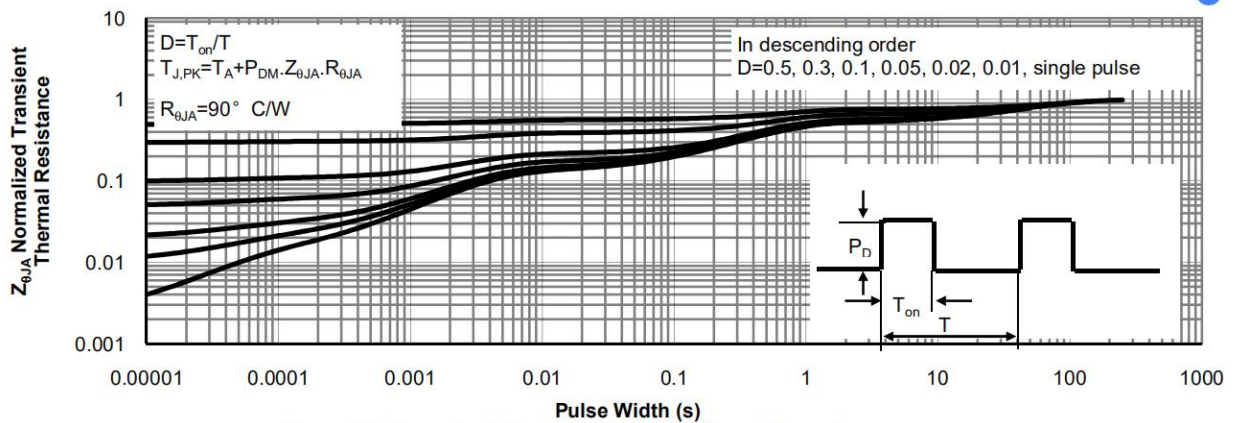
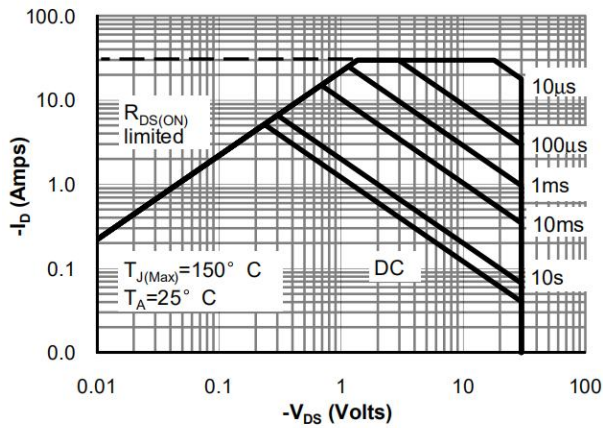
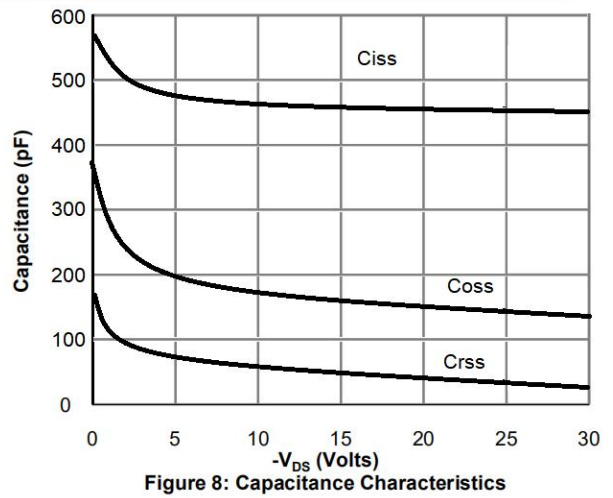
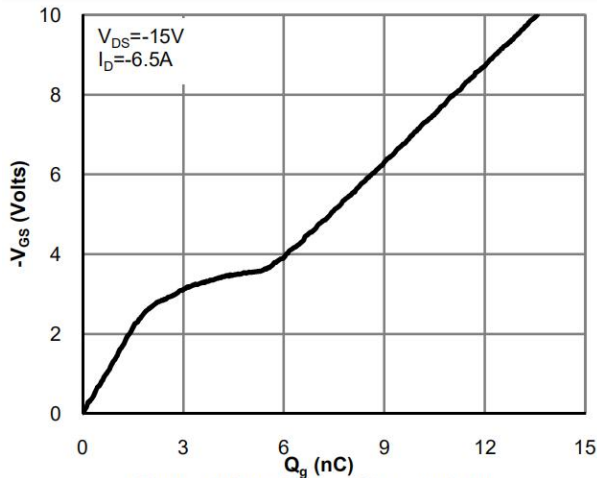


Figure 6: Body-Diode Characteristics

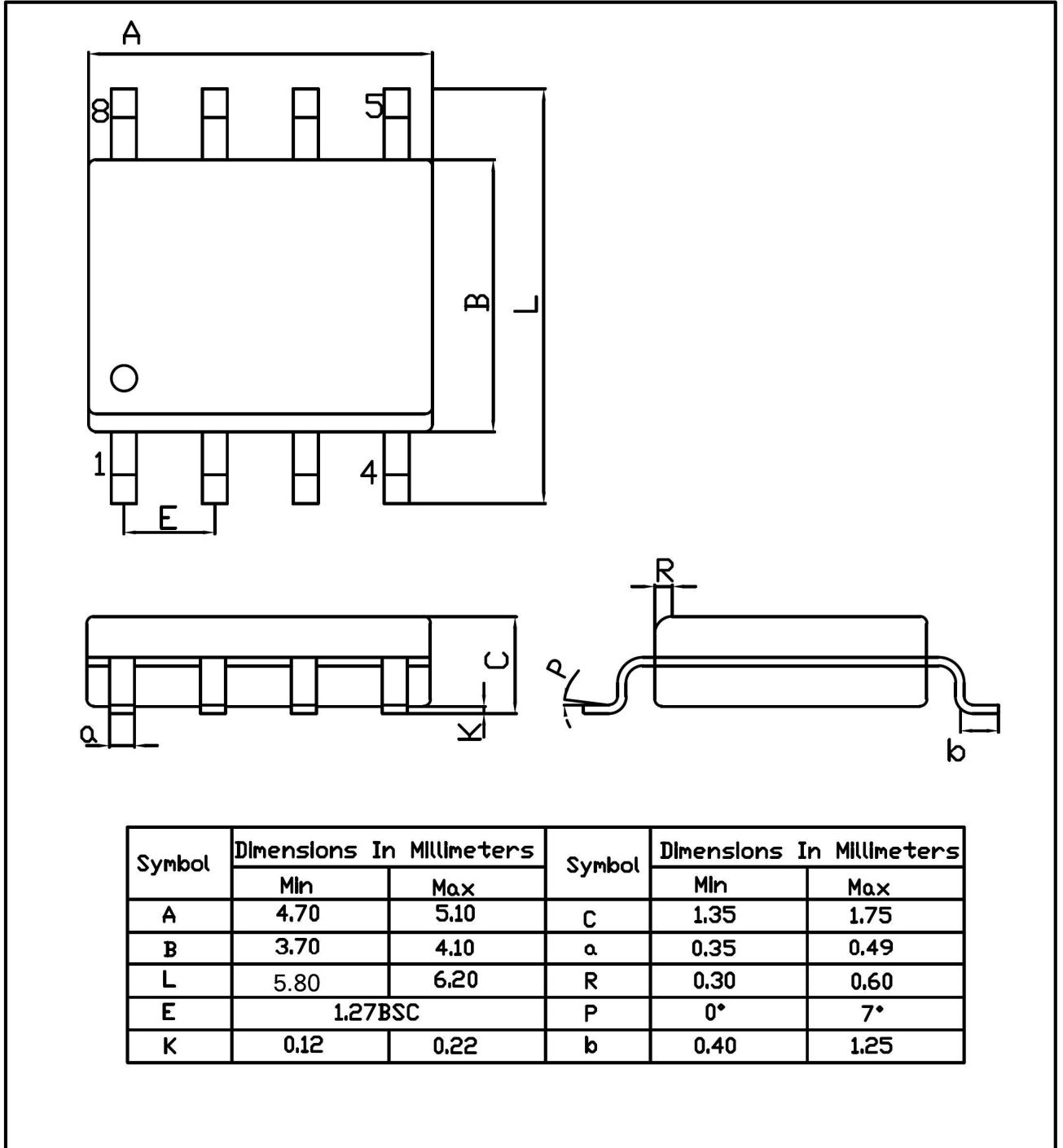
P-沟道电参数曲线图 / P-CHANNEL Electrical Characteristic Curve



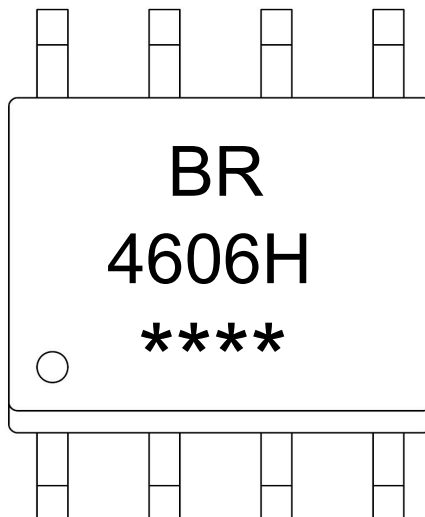
外形尺寸图 / Package Dimensions

SOP-8

Unit:mm



印章说明 / Marking Instructions



说明：

BR： 为公司代码

4606H： 为型号代码

****： 为生产批号代码，随生产批号变化。

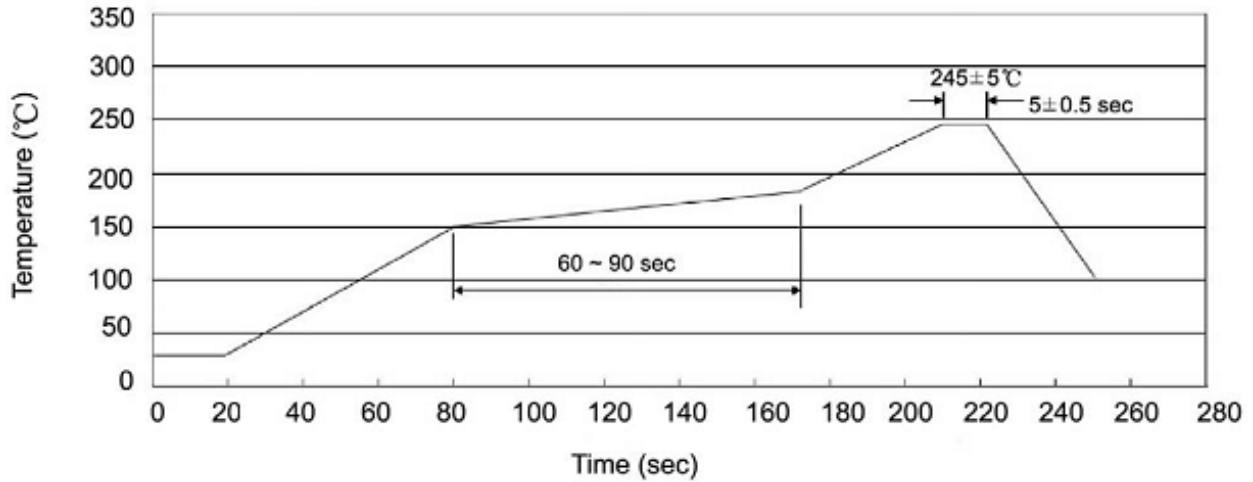
Note:

BR: Company Code.

4606H: Product Type.

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

使用说明 / Notices