

描述 / Descriptions

SOP-8 塑封封装 P 沟耗尽型场效应管。

P-Channel Enhancement Mode Field Effect Transistor in a SOP-8 Plastic Package.

特征 / Features

$V_{DS} (V) = -30V$

$I_D = -15 A$

Max $R_{DS(ON)} < 9.5m\Omega$ ($V_{GS} = -10V$)

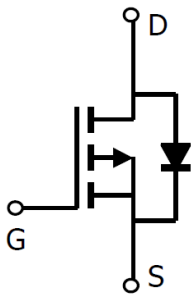
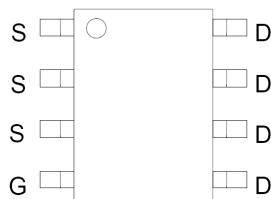
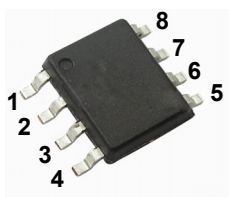
Max $R_{DS(ON)} < 15m\Omega$ ($V_{GS} = -4.5V$)

无卤产品。Halogen-free Product.

用途 / Applications

适用于开关电路， PWM 应用电路。

Suitable for use as a load switch or in PWM applications.

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

PIN1、PIN 2、PIN 3 : S PIN 4 : G

PIN5、PIN 6、PIN 7、PIN 8 : D

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
Drain-Source Voltage		V_{DS}	-30	V
Gate-Source Voltage		V_{GS}	±20	V
Drain Current –Continuous ^A	$T_A=25^{\circ}\text{C}$	I_D	-15	A
	$T_A=70^{\circ}\text{C}$		-12.8	A
Pulsed Drain Current ^B		I_{DM}	-80	A
Power Dissipation for Single Operation ^A	$T_A=25^{\circ}\text{C}$	P_D	3	W
	$T_A=70^{\circ}\text{C}$		2.1	
Maximum Junction-to-Ambient ^A	$t \leq 10\text{s}$	$R_{\theta JA}$	40	$^{\circ}\text{C/W}$
Maximum Junction-to-Ambient ^A			75	$^{\circ}\text{C/W}$
Maximum Junction-to-Lead ^C		$R_{\theta JL}$	24	$^{\circ}\text{C/W}$
Operating and Junction Temperature Range		$T_j \quad T_{stg}$	-55~150	$^{\circ}\text{C}$

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
Drain-Source Breakdown Voltage	BV_{DS}	$V_{GS}=0\text{V} \quad I_D=-250\mu\text{A}$	-30			V
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS}=-30\text{V} \quad V_{GS}=0\text{V}$			-1.0	μA
		$V_{DS}=-30\text{V} \quad V_{GS}=0\text{V} \quad T_J=55^{\circ}\text{C}$			-30	μA
Gate-Body Leakage Current Forward	I_{GSS}	$V_{GS}=\pm 20\text{V} \quad V_{DS}=0\text{V}$			±100	nA
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS} \quad I_D=250\mu\text{A}$	-1.0		-2.5	V
Static Drain-Source On-Resistance	$R_{DS(on)}$	$V_{GS}=-10\text{V} \quad I_D=-10\text{A}$		8.0	9.5	mΩ
		$V_{GS}=-4.5\text{V} \quad I_D=-8.0\text{A}$		12.4	15	
Diode Forward Voltage	V_{SD}	$I_S=1\text{A} \quad V_{GS}=0\text{V}$		-0.71	-1.0	V
Forward Transconductance	g_{FS}	$V_{DS}=-5\text{V} \quad I_D=-15\text{A}$	35	50		S
Maximum Body-Diode Continuous Current	I_S			5		A

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
Input Capacitance	C_{iss}	$V_{DS}=-15V$ $V_{GS}=0V$ $f=1.0MHz$		5270		pF
Output Capacitance	C_{oss}			945		
Reverse Transfer Capacitance	C_{rss}			745		
Total Gate Charge(10V)	Q_g	$V_{DS}=-10V$ $I_D=-15A$ $V_{GS}=-15V$		100		nC
Total Gate Charge(4.5V)				51.5		
Gate-Source Charge	Q_{gs}			14.5		
Gate-Drain Charge	Q_{gd}			23		
Gate resistance	R_g	$V_{GS}=0V$ $V_{DS}=0V$ $f=1MHz$		2		Ω
Turn-On Delay Time	$t_{d(on)}$	$V_{DS}=-10V$ $R_L=1\Omega$ $V_{GS}=-15V$ $R_{GEN}=3\Omega$		14		ns
Turn-On Rise Time	t_r			16.5		
Turn-Off Delay Time	$t_{d(off)}$			76.5		
Turn-Off Fall Time	t_f			37.5		
Continuous Drain-Source Diode Forward Current	I_S				2.5	A
Body Diode Reverse Recovery Time	t_{rr}	$I_F=10A$ $di/dt=100A/\mu s$		36.7		ns
Body Diode Reverse Recovery Charge	Q_{rr}			28		nC

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 $T_A=25^\circ C$. The value in any 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 are obtained using $t \leq 300\mu s$ 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 $T_A=25^\circ C$. The SOA curve provides a single pulse rating.

电参数曲线图 / Electrical Characteristic Curve

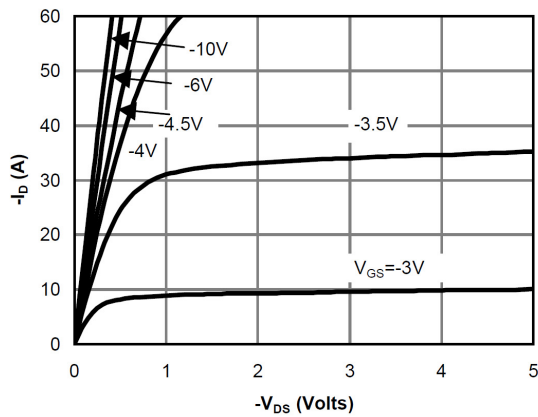


Fig 1: On-Region Characteristics

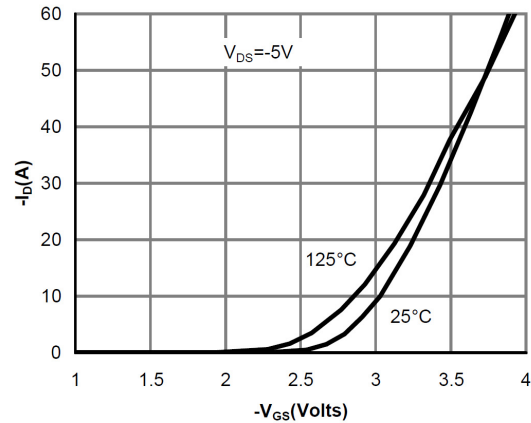


Figure 2: Transfer Characteristics

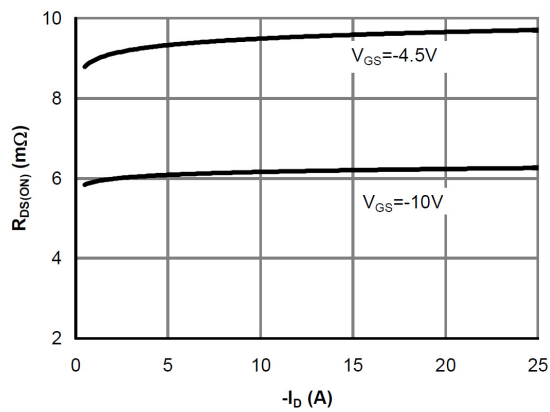


Figure 3: On-Resistance vs. Drain Current and Gate Voltage

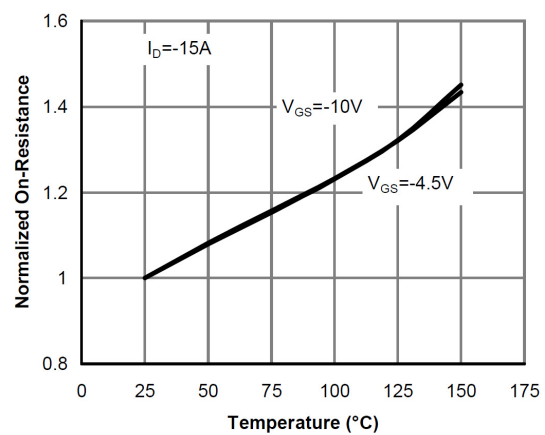


Figure 4: On-Resistance vs. Junction Temperature

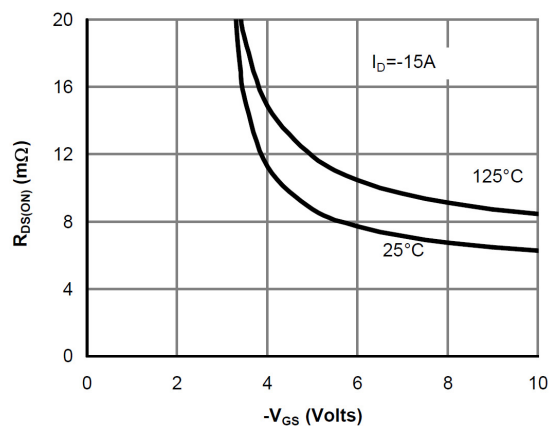


Figure 5: On-Resistance vs. Gate-Source Voltage

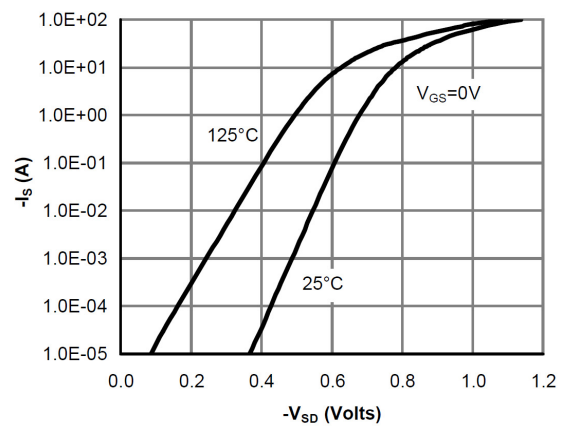


Figure 6: Body-Diode Characteristics

电参数曲线图 / Electrical Characteristic Curve

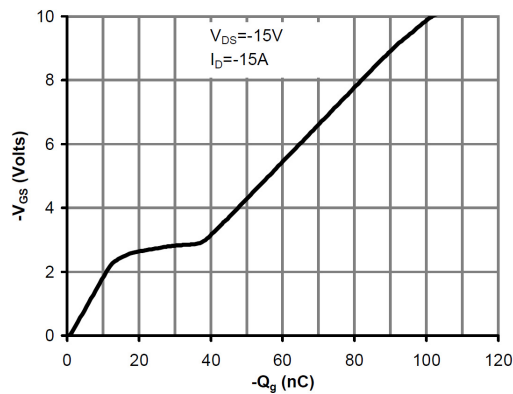


Figure 7: Gate-Charge Characteristics

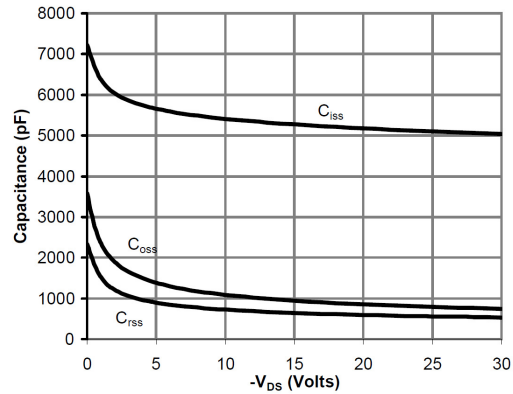


Figure 8: Capacitance Characteristics

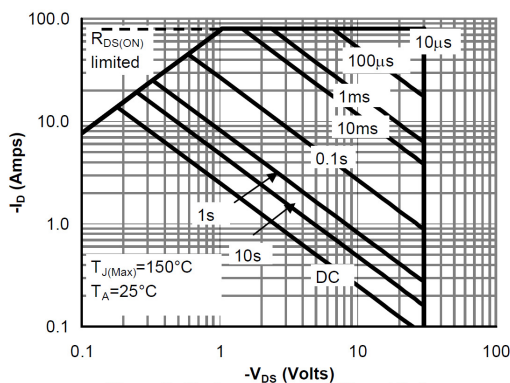


Figure 9: Maximum Forward Biased Safe Operating Area (Note E)

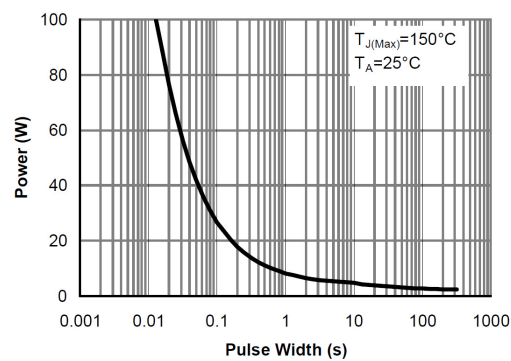


Figure 10: Single Pulse Power Rating Junction-to-Ambient (Note E)

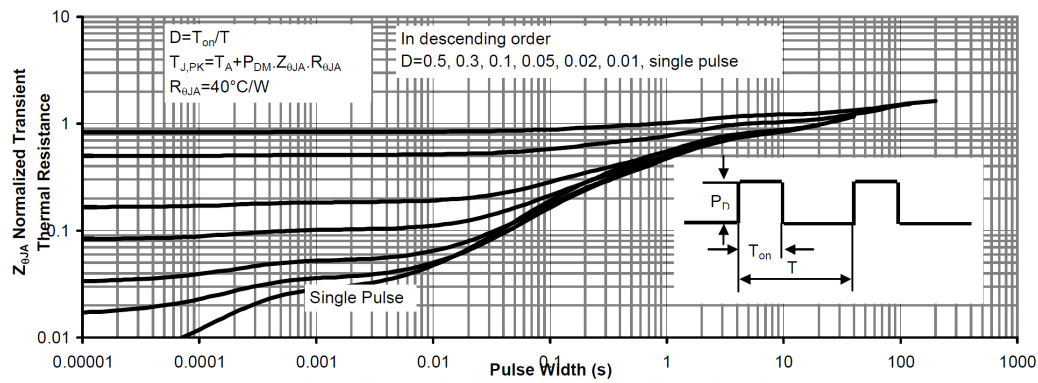
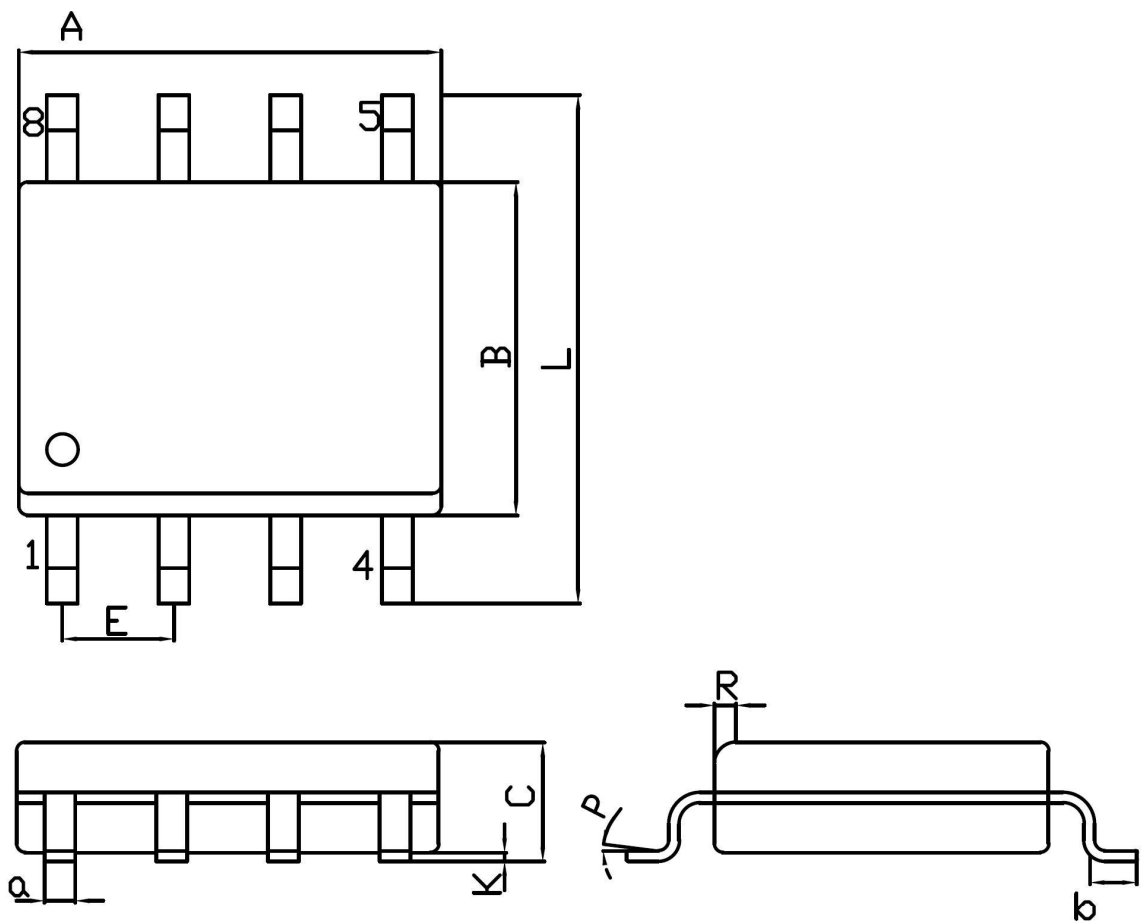


Figure 11: Normalized Maximum Transient Thermal Impedance

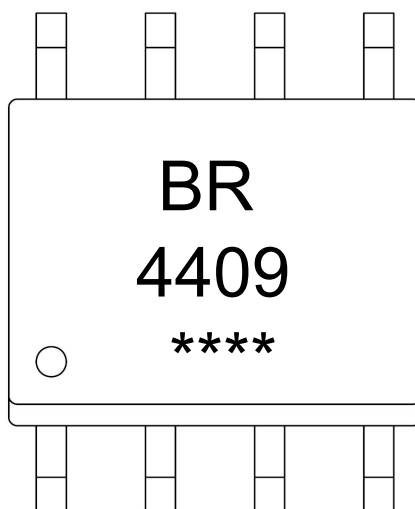
外形尺寸图 / Package Dimensions

SOP-8

Unit:mm



Symbol	Dimensions In Millimeters		Symbol	Dimensions In Millimeters	
	Mln	Max		Mln	Max
A	4.70	5.10	C	1.35	1.75
B	3.70	4.10	a	0.35	0.49
L	5.80	6.20	R	0.30	0.60
E	1.27BSC		P	0°	7°
K	0.12	0.22	b	0.40	1.25

印章说明 / Marking Instructions

说明：

BR： 为公司代码

4409： 为型号代码

****： 为生产批号代码，随生产批号变化

Note:

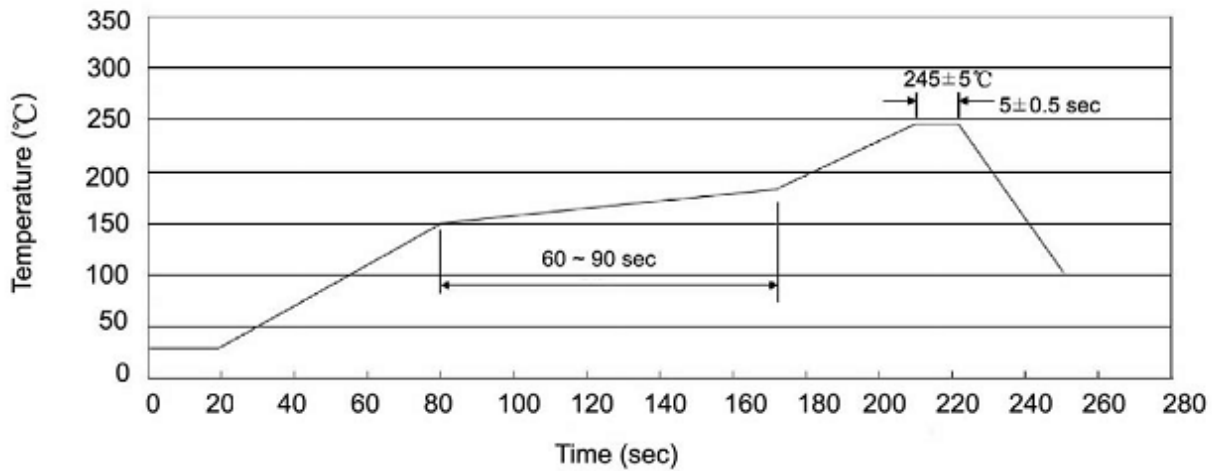
BR: Company Code.

4409: 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