

AP4606

N-P-Channel Power MOSFET

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

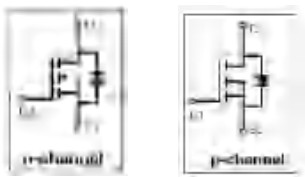
N-channel	P-channel
$V_{DS}(V)=30V$	$V_{DS}(V)=-30V$
$I_D=6.9A$	$I_D=-6A$
$R_{DS(ON)}<28m\ \Omega$ ($V_{GS}=10V$)	$R_{DS(ON)}<35m\ \Omega$ ($V_{GS}=10V$)
$R_{DS(ON)}<42m\ \Omega$ ($V_{GS}=4.5V$)	$R_{DS(ON)}<58m\ \Omega$ ($V_{GS}=4.5V$)

用途 / Applications

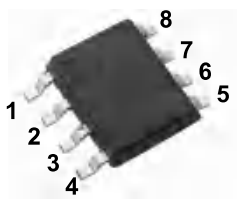
用于高功率 DC/DC 转换和功率开关。适用于作负载开关或脉宽调制应用。

These devices are well suited for high efficiency switching DC/DC converters and switch mode power supplies. This device is 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 : S2	PIN 2 : G2	PIN 3 : S1	PIN 4 : G1
PIN 5 : D1	PIN 6 : D1	PIN 7 : D2	PIN 8 : D2

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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	$R_{\theta JA}(t \leq 10\text{s})$	62.5		°C/W
	$R_{\theta JA}$	110		°C/W
Maximum Junction-to-Lead ^C	$R_{\theta JL}$	60		°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 $t \leq 10\text{s}$ 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.

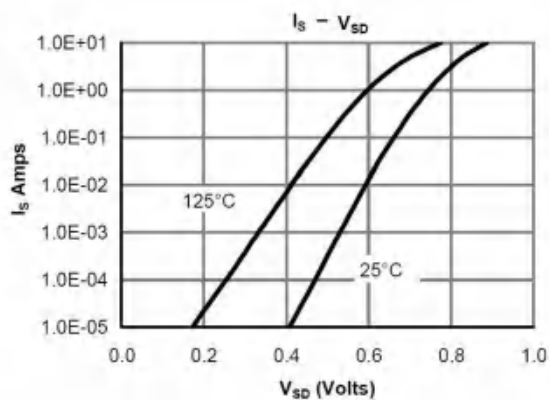
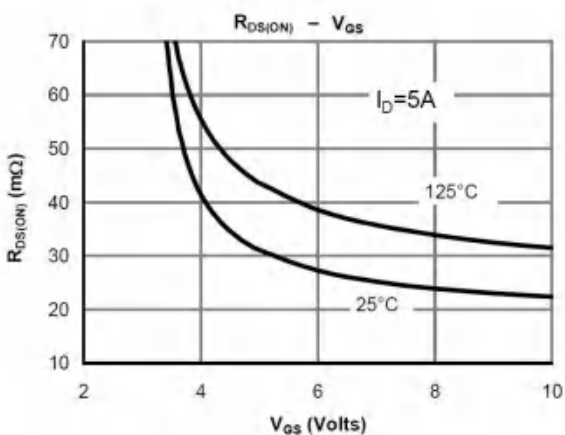
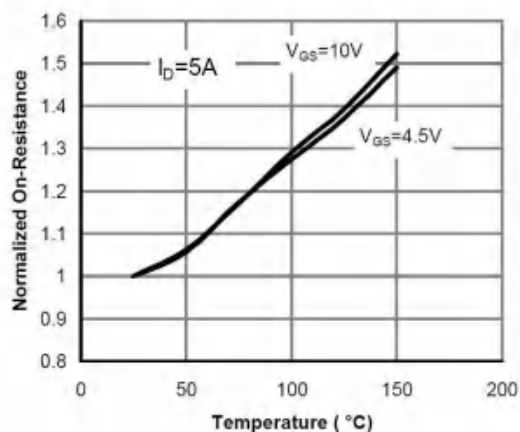
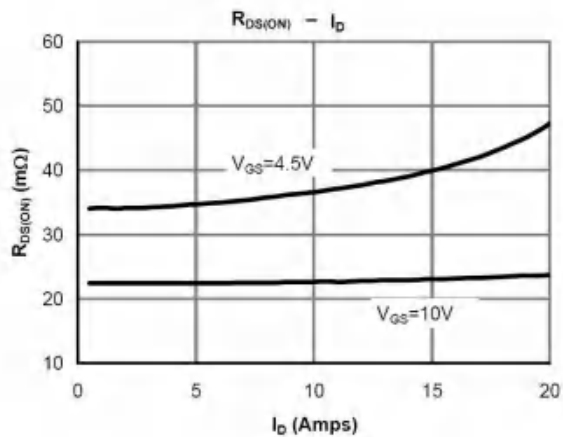
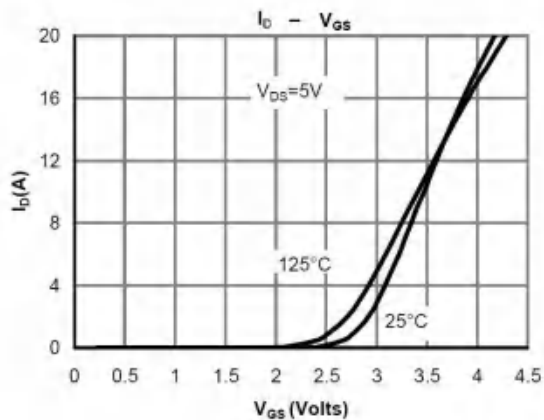
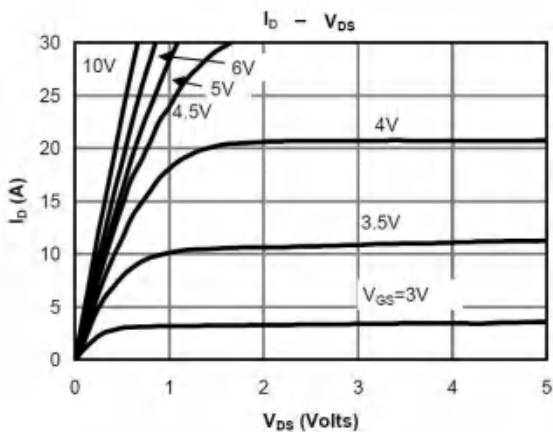
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N-P-Channel Power MOSFET
N-沟道电性能参数/N-CHANNEL Electrical Characteristics(Ta=25°C)

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			V
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS}=24V$	$V_{GS}=0V$			1.0	μA
		$V_{DS}=24V$ $T_J=55^\circ C$	$V_{GS}=0V$			5.0	μA
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	1.9	3.0	V
On state drain current	$I_{D(on)}$	$V_{DS}=4.5V$	$V_{GS}=5.0V$	20			A
Static Drain-Source On-Resistance	$R_{DS(on)}$	$V_{GS}=10V$	$I_D=6.9A$		22.5	28	m Ω
		$V_{GS}=10V$ $T_J=125^\circ C$	$I_D=6.9A$		31.3	38	m Ω
		$V_{GS}=4.5V$	$I_D=5.0A$		34.5	42	m Ω
Forward Transconductance	g_{FS}	$V_{DS}=5.0V$	$I_D=6.9A$	10	15.4		S
Diode Forward Voltage	V_{SD}	$V_{GS}=0V$	$I_S=1.0A$		0.76	1.0	V
Maximum Body-Diode Continuous Current	I_S					3.0	A
Input Capacitance	C_{iss}				680		pF
Output Capacitance	C_{oss}	$V_{DS}=15V$ $f=1.0MHz$	$V_{GS}=0V$		102		pF
Reverse Transfer Capacitance	C_{rss}				77		pF
Gate resistance	R_g	$V_{DS}=0V$ $f=1.0MHz$	$V_{GS}=0V$		3.0		Ω
Total Gate Charge(10V)	Q_g	$V_{GS}=10V$ $I_D=6.9A$	$V_{DS}=15V$		13.84		nC
Total Gate Charge(4.5V)					6.74		nC
Gate-Source Charge	Q_{gs}				1.82		nC
Gate-Drain Charge	Q_{gd}				3.2		nC
Turn-On Delay Time	$t_{d(on)}$						4.6
Turn-On Rise Time	t_r	$V_{DS}=15V$ $R_L=2.1\Omega$	$V_{GS}=10V$ $R_{GEN}=3\Omega$		4.1		ns
Turn-Off Delay Time	$t_{d(off)}$				20.6		ns
Turn-Off Fall Time	t_f				5.2		ns
Body Diode Reverse Recovery Time	t_{rr}	$I_F=6.9A$ $dI/dt=100A/\mu s$			16.5		ns
Body Diode Reverse Recovery Charge	Q_{rr}	$I_F=6.9A$ $dI/dt=100A/\mu s$			7.8		nC

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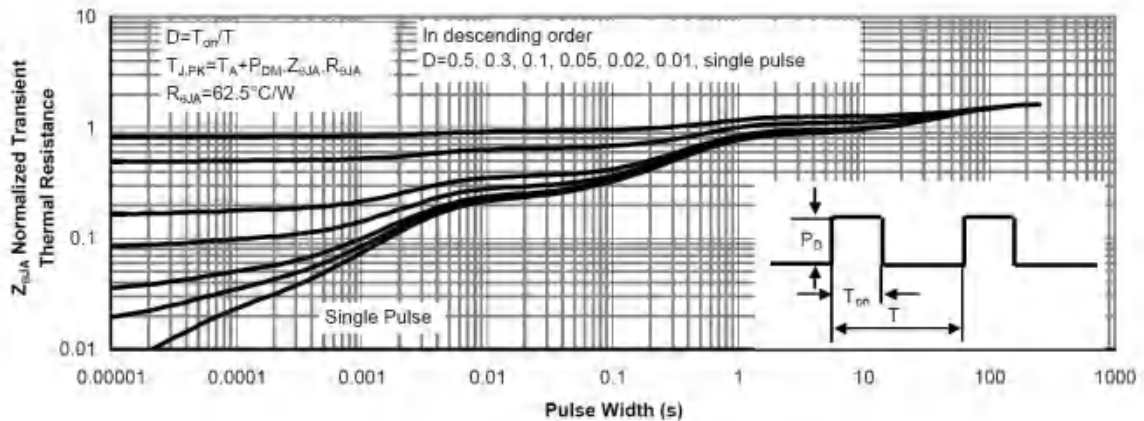
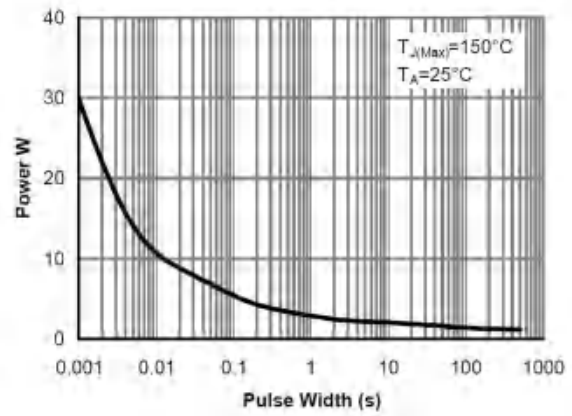
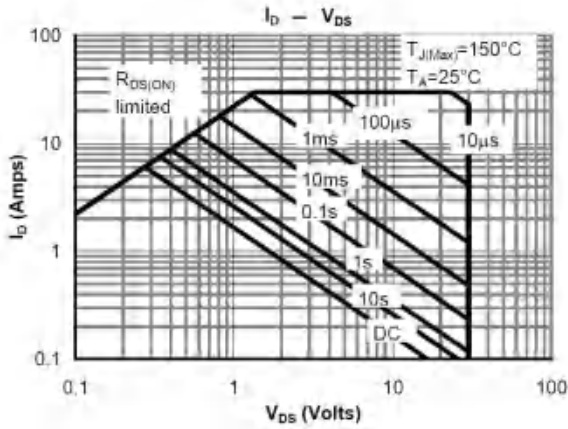
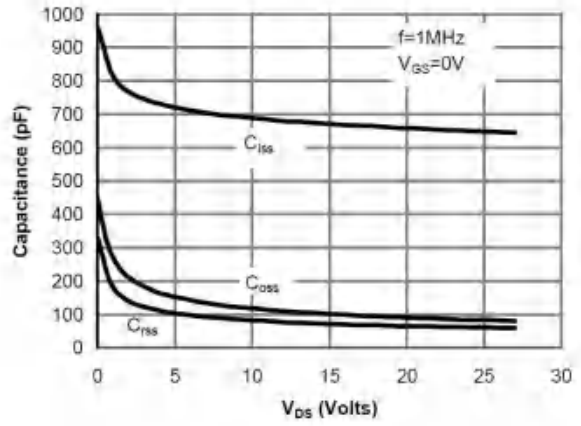
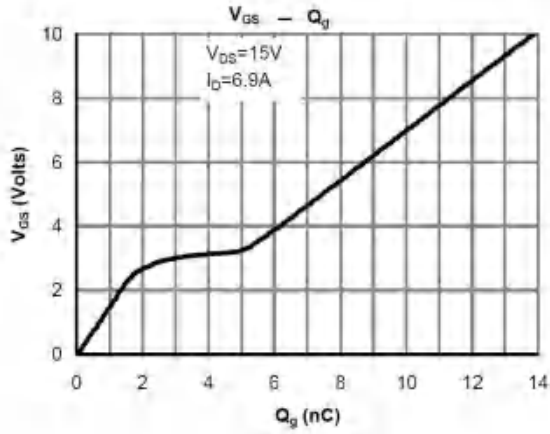
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N-沟道电参数曲线图 / N-CHANNEL Electrical Characteristic Curve



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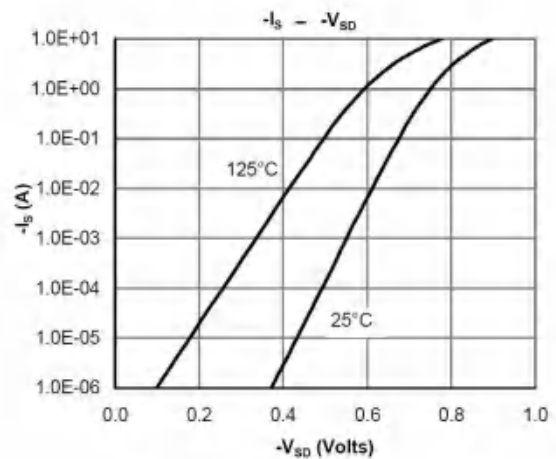
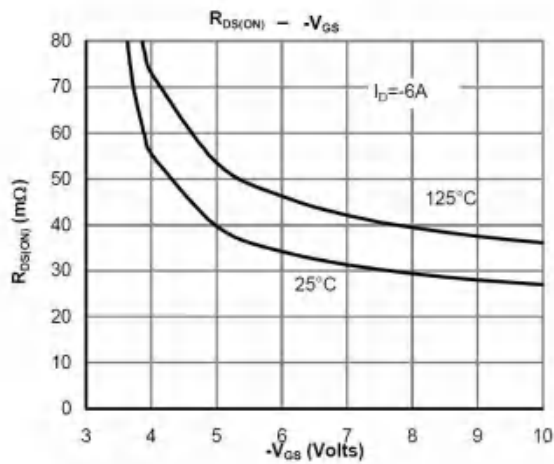
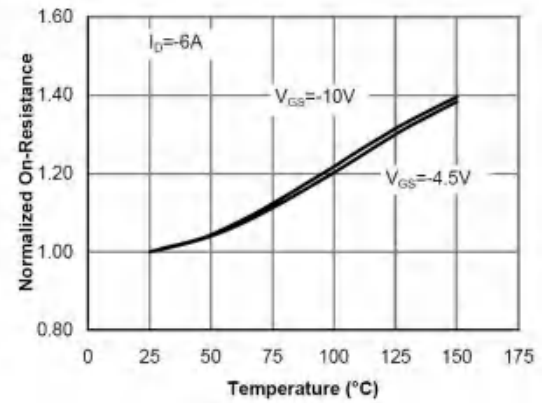
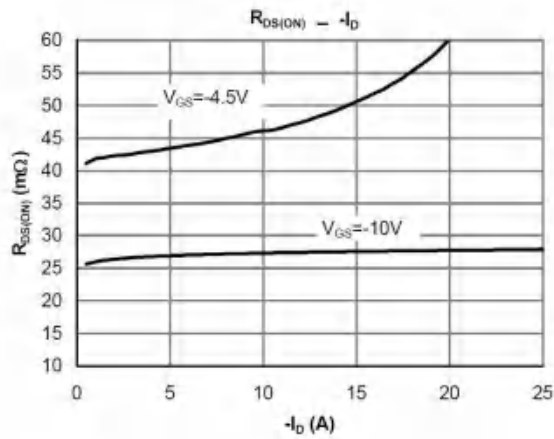
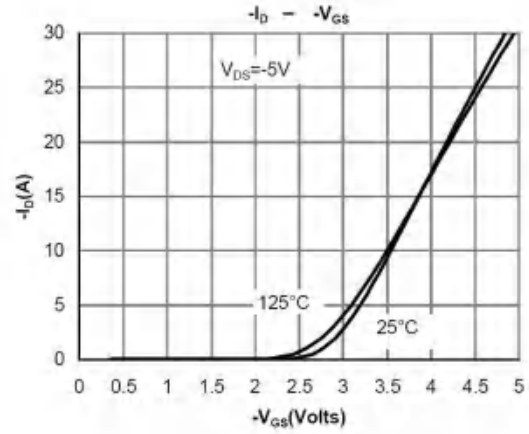
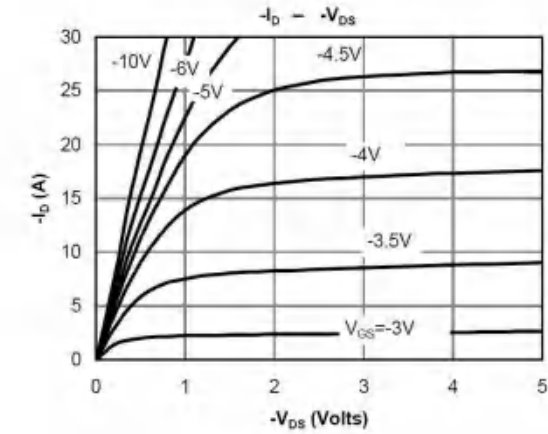
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Drain-Source Breakdown Voltage	BV _{DSS}	V _{GS} =0V I _D =-250μA	-30			V
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} =-24V V _{GS} =0V			-1.0	μA
		V _{DS} =-24V V _{GS} =0V T _J =55°C			-5.0	μA
Gate-Body leakage current	I _{GSS}	V _{GS} =±20V V _{DS} =0V			±100	nA
Gate Threshold Voltage	V _{GS(th)}	V _{DS} =V _{GS} I _D =-250μA	-1.2	-2.0	-2.4	V
On state drain current	I _{D(on)}	V _{DS} =-4.5V V _{GS} =-5.0V	30			A
Static Drain-Source On-Resistance	R _{DS(on)}	V _{GS} =-10V I _D =-6.0A		28	35	mΩ
		V _{GS} =-10V I _D =-6.0A T _J =125°C		37	45	mΩ
		V _{GS} =-4.5V I _D =-5.0A		44	58	mΩ
Forward Transconductance	g _{FS}	V _{DS} =-5.0V I _D =-6.0A		13		S
Diode Forward Voltage	V _{SD}	V _{GS} =0V I _S =-1.0A		-0.76	-1.0	V
Maximum Body-Diode Continuous Current	I _S				-4.2	A
Input Capacitance	C _{iss}	V _{DS} =-15V V _{GS} =0V f=1.0MHz		920		pF
Output Capacitance	C _{oss}			190		pF
Reverse Transfer Capacitance	C _{rss}			122		pF
Gate resistance	R _g	V _{DS} =0V V _{GS} =0V f=1.0MHz		3.6		Ω
Total Gate Charge(10V)	Q _g	V _{GS} =-10V V _{DS} =-15V I _D =-6.0A		18.5		nC
Total Gate Charge(4.5V)				9.6		nC
Gate-Source Charge	Q _{gs}			2.7		nC
Gate-Drain Charge	Q _{gd}			4.5		nC
Turn-On Delay Time	t _{d(on)}				7.7	
Turn-On Rise Time	t _r	V _{DS} =-15V V _{GS} =-10V R _L =2.7Ω R _{GEN} =3Ω		5.7		ns
Turn-Off Delay Time	t _{d(off)}			20.2		ns
Turn-Off Fall Time	t _f			9.5		ns
Body Diode Reverse Recovery Time	t _{rr}	I _F =-6.0A dI/dt=100A/μs		20		ns
Body Diode Reverse Recovery Charge	Q _{rr}	I _F =-6.0A dI/dt=100A/μs		8.8		nC

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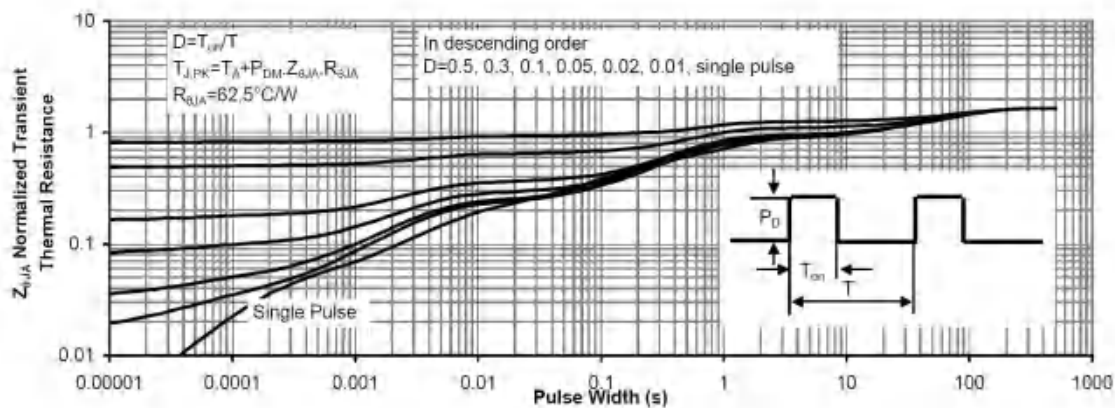
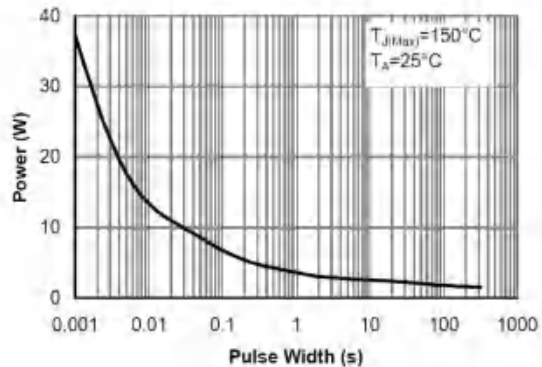
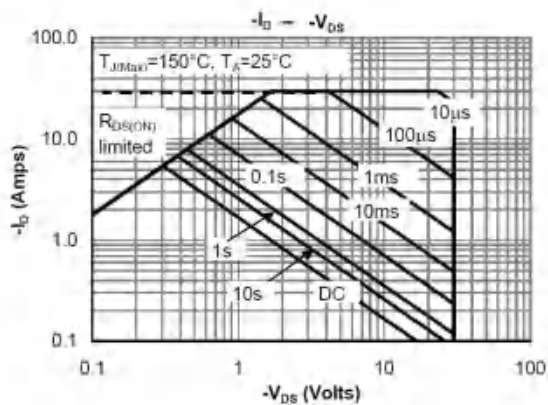
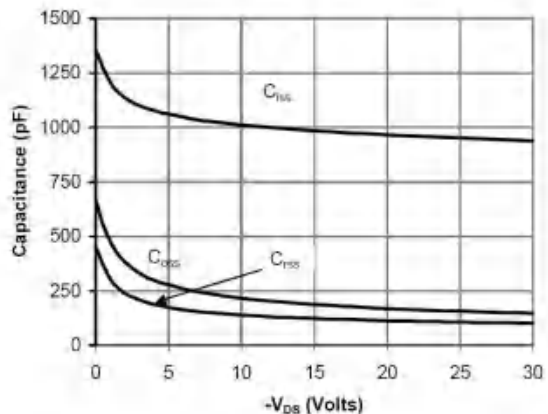
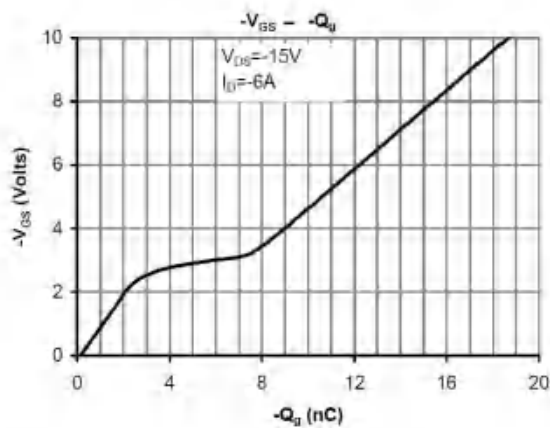
P-沟道电参数曲线图 / P-CHANNEL Electrical Characteristic Curve



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



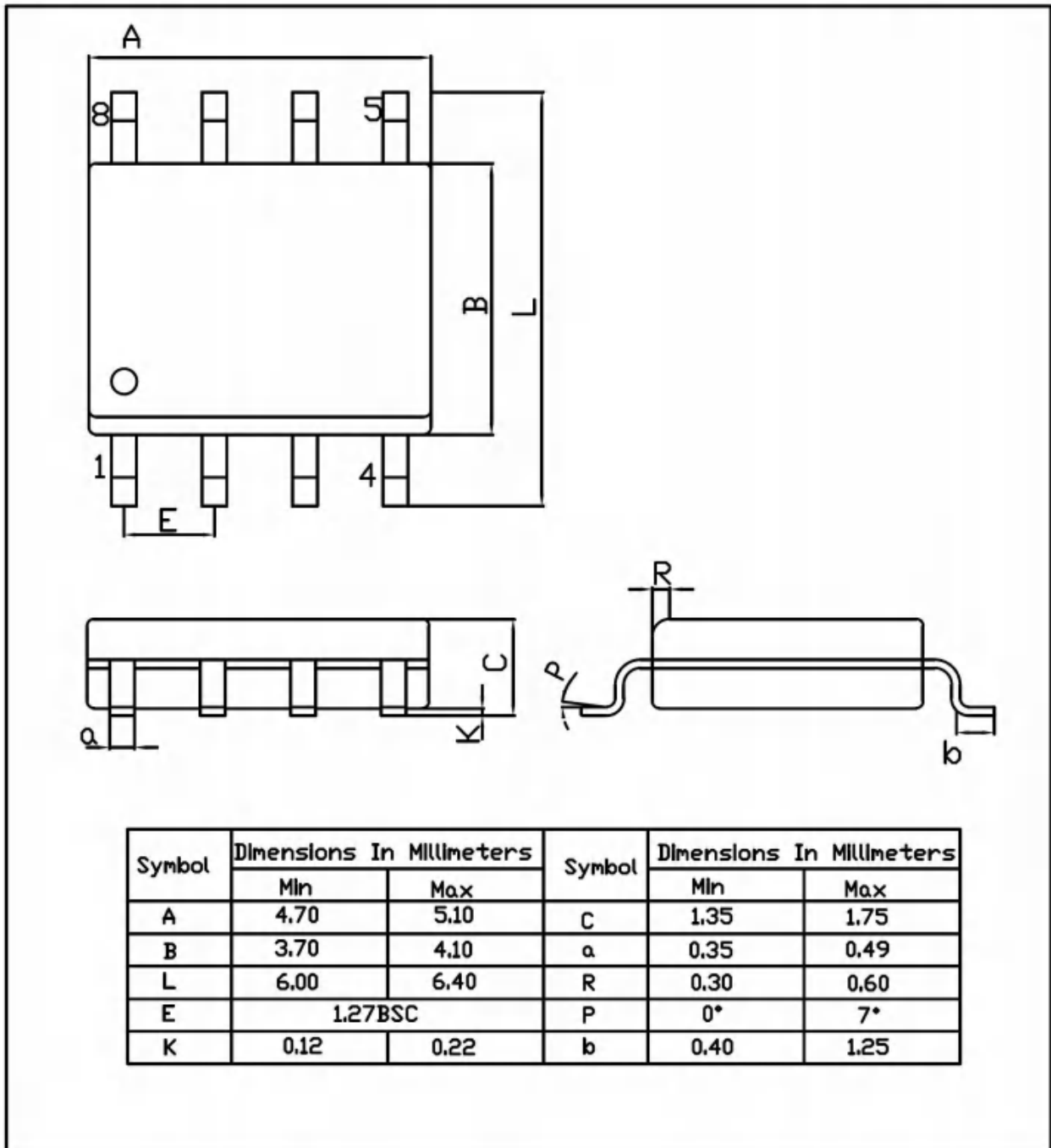
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外形尺寸图 / Package Dimensions

SOP-8

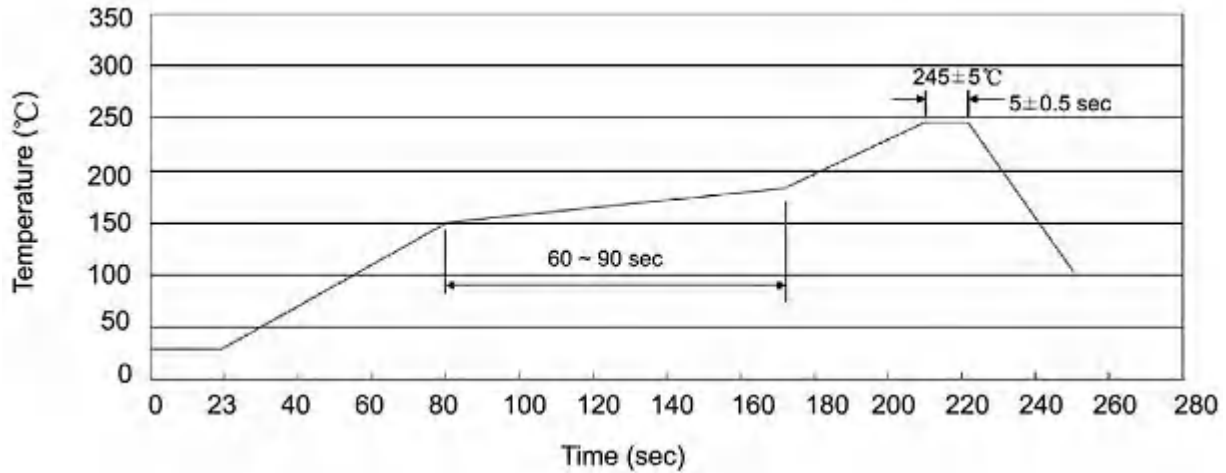
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回流焊温度曲线图(无铅) / Temperature Profile for IR Reflow Soldering(Pb-Free)



说明：

- 1、预热温度 25~150°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:25~150°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	5	40,000	13" ×16	360×360×50	385×257×392

使用说明 / Notices