

# AP3401

## P-Channel Power MOSFET

### 描述 / Descriptions

SOT23-3 塑封封装 P 道 MOS 场效应管。P- CHANNEL MOSFET in a SOT23-3 Plastic Package.

### 特征 / Features

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

$I_D = -4.2 A (V_{GS} = -10V)$

$R_{DS(ON)} < 60m\Omega (V_{GS} = -10V)$

$R_{DS(ON)} < 65m\Omega (V_{GS} = -4.5V)$

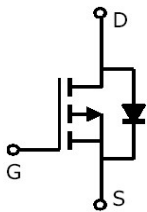
$R_{DS(ON)} < 85m\Omega (V_{GS} = -2.5V)$

### 用途 / Applications

适用于作负载开关或脉宽调制应用。

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 : S

PIN 2 : G

PIN 3 : D

### 印章代码 / Marking

Marking	
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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
Drain-Source Voltage	$V_{DS}$	-30	V
Drain Current – Continuous	$I_D$	-4.2	A
Drain Current- Continuous <sup>A</sup>	$I_D(T_a=70^\circ\text{C})$	-3.5	A
Pulsed Drain Current <sup>B</sup>	$I_{DM}$	-30	A
Gate-Source Voltage	$V_{GS}$	±12	V
Total Power Dissipation <sup>A</sup>	$P_D$	1.4	W
Total Power Dissipation <sup>A</sup>	$P_D(T_a=70^\circ\text{C})$	1.0	W
Operating and Storage Junction Temperature Range	$T_J, T_{STG}$	-55 to 150	°C
Maximum Junction-to-Ambient <sup>A</sup>	$R_{\theta JA}$	125	°C/W
Maximum Junction-to-Lead <sup>C</sup>	$R_{\theta JL}$	60	°C/W

**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	$BV_{DSS}$	$V_{GS}=0V$ $I_D=-250\mu A$	-30			V
Zero Gate Voltage Drain Current	$I_{DSS}$	$V_{DS}=-24V$ $V_{GS}=0V$			-1	μA
		$V_{DS}=-24V$ $V_{GS}=0V$ $T_J=55^\circ\text{C}$			-5	μA
Gate–Body Leakage.	$I_{GSS}$	$V_{GS}=\pm 12V$ $V_{DS}=0V$			±0.1	μA
On–State Drain Current	$I_{D(on)}$	$V_{GS}=-4.5V$ $V_{DS}=-5V$	-25			A
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}$ $I_D=-250\mu A$	-0.7	-0.9	-1.2	V
Static Drain–Source On–Resistance	$R_{DS(on)(1)}$	$V_{GS}=-10V$ $I_D=-4.2A$		48	60	mΩ
	$R_{DS(on)(2)}$	$V_{GS}=-10V$ $I_D=-4.2A$ $T_J=125^\circ\text{C}$			75	
	$R_{DS(on)(3)}$	$V_{GS}=-4.5V$ $I_D=-4A$		54	65	
	$R_{DS(on)(4)}$	$V_{GS}=-2.5V$ $I_D=-1A$		75	85	
Forward Transconductance	$g_{FS}$	$V_{DS}=-5V$ $I_D=-5A$	4	8		S
Drain–Source Diode Forward Voltage	$V_{SD}$	$V_{GS}=0V$ $I_S=-1A$		-0.75	-1.0	V

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**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	$C_{iss}$	$V_{DS}=-15V$ $V_{GS}=0V$ $f=1MHz$		957		pF
Output Capacitance	$C_{oss}$			115		
Reverse Transfer Capacitance	$C_{rss}$			77		
Turn-On Delay Time	$t_{d(on)}$	$V_{GS}=-10V$ $R_L=3.6\Omega$ $V_{DS}=-15V$ $R_{GEN}=6\Omega$		6.3		ns
Turn-On Rise Time	$t_r$			3.2		
Turn-Off Delay Time	$t_{d(off)}$			38.2		
Turn-Off Fall Time	$t_f$			12		

A: The value of  $R_{\theta JA}$  is measured with the device mounted on 1in<sup>2</sup> 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.

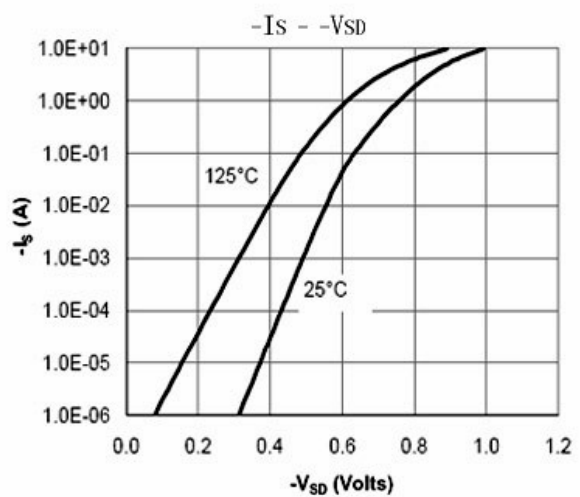
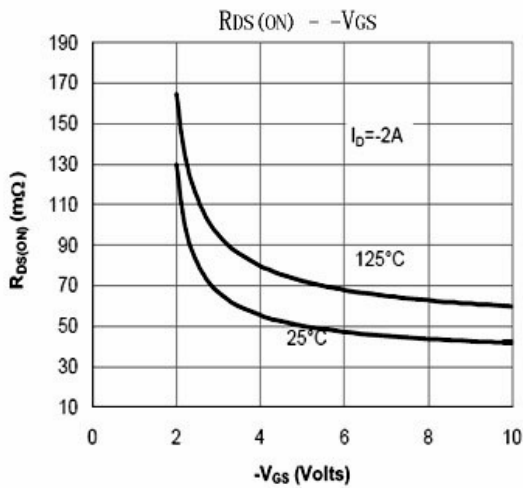
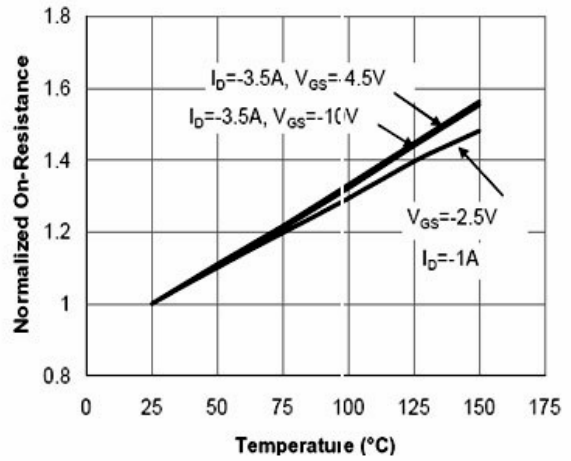
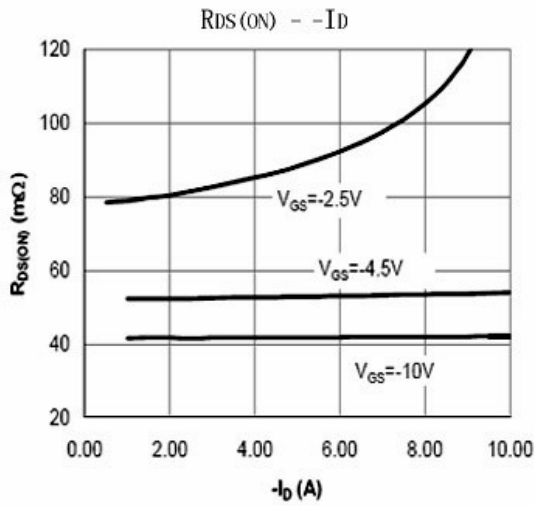
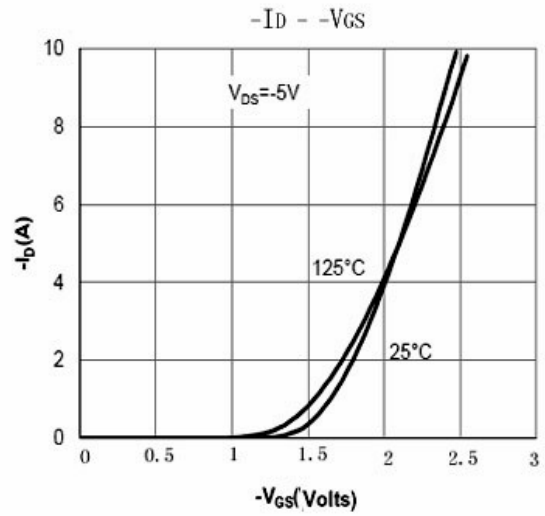
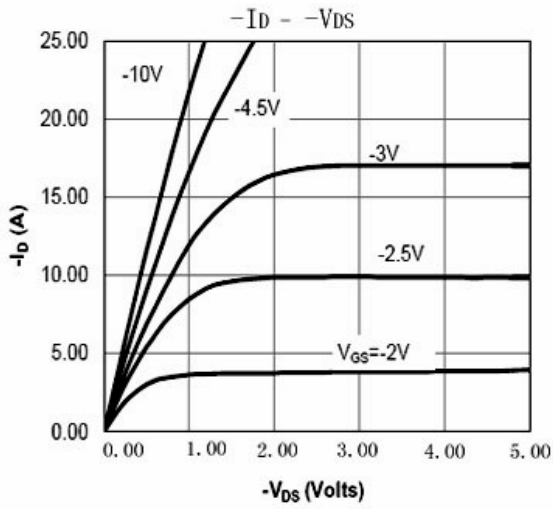
D. The static characteristics in Figures 1 to 6,12,14 are obtained using 80  $\mu s$  pulses, duty cycle 0.5% max.

E. These tests are performed with the device mounted on 1 in<sup>2</sup> 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.

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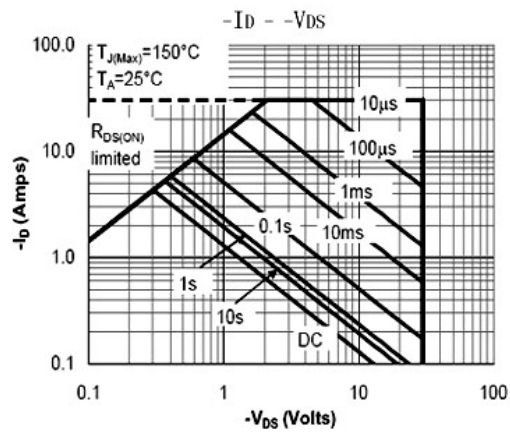
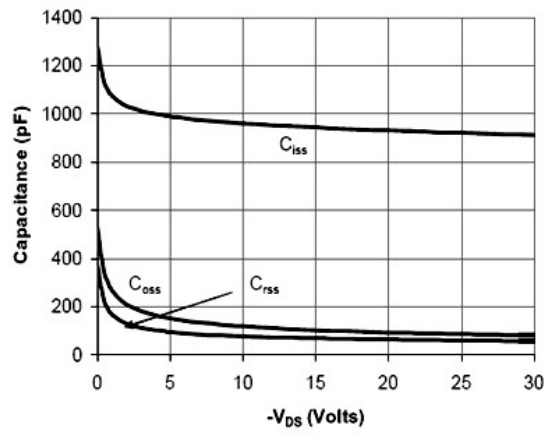
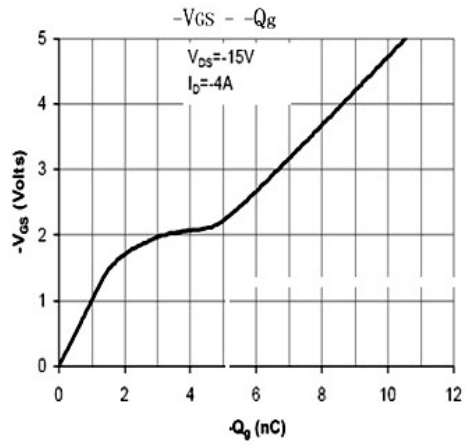
**电参数曲线图 / Electrical Characteristic Curve**



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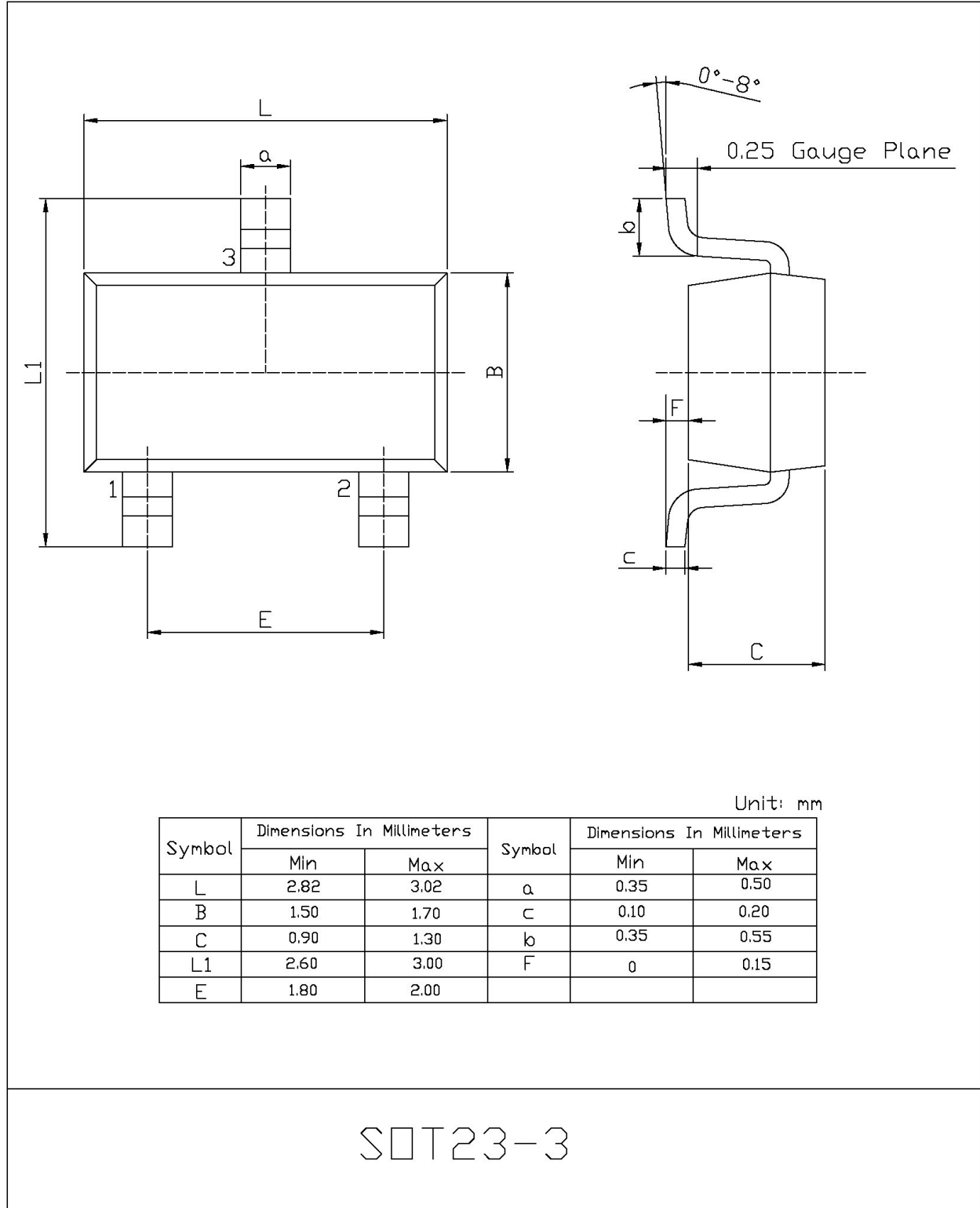
电参数曲线图 / Electrical Characteristic Curve



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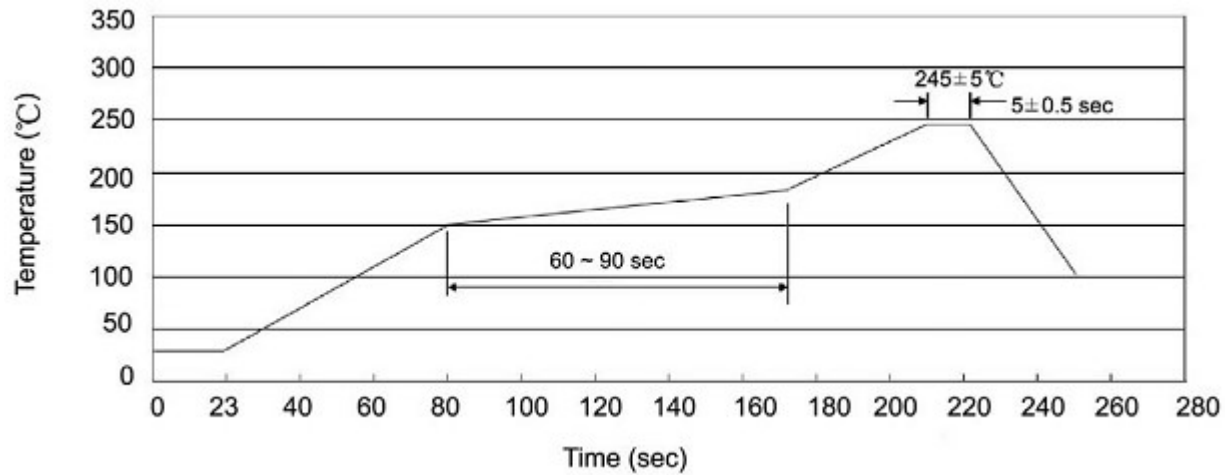
外形尺寸图 / Package Dimensions



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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 <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
SOT-23-3	3,000	10	30,000	4	120,000	7" ×8	210×205×205	445×230×435

**使用说明 / Notices**