

## 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

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

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

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

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

$R_{DS(ON)} < 120m\Omega (V_{GS} = -2.5V)$

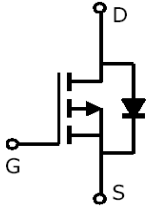
符合 AEC-Q101 标准高可靠性要求，无卤产品。Qualified to AEC-Q101 Standards for High Reliability, HF Product.

## 用途 / Applications

适用于作负载开关或脉宽调制应用，满足汽车应用的严格要求。

This device is suitable for use as a load switch or in PWM applications, Meet the stringent requirements of automotive applications.

## 内部等效电路 / Equivalent Circuit



## 引脚排列 / Pinning



## 印章代码 / Marking

Marking	QB1H
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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 <sub>DS</sub>	-30	V
Drain Current – Continuous	I <sub>D</sub>	-4.2	A
Drain Current- Continuous <sup>A</sup>	I <sub>D</sub> (T <sub>a</sub> =70°C)	-3.5	A
Pulsed Drain Current <sup>B</sup>	I <sub>DM</sub>	-30	A
Gate-Source Voltage	V <sub>GS</sub>	±12	V
Total Power Dissipation <sup>A</sup>	P <sub>D</sub>	1.4	W
Total Power Dissipation <sup>A</sup>	P <sub>D</sub> (T <sub>a</sub> =70°C)	1.0	W
Operating and Storage Junction Temperature Range	T <sub>J</sub> , T <sub>STG</sub>	-55 to 150	°C
Maximum Junction-to-Ambient <sup>A</sup>	R <sub>θJA</sub> (T <sub>a</sub> =70°C)	125	°C/W
Maximum Junction-to-Lead <sup>C</sup>	R <sub>θJL</sub>	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 <sub>DSS</sub>	V <sub>GS</sub> =0V I <sub>D</sub> =-250μA	-30			V
Zero Gate Voltage Drain Current	I <sub>DSS</sub>	V <sub>DS</sub> =-24V V <sub>GS</sub> =0V			-1	μA
		V <sub>DS</sub> =-24V V <sub>GS</sub> =0V T <sub>J</sub> =55°C			-5	μA
Gate–Body Leakage.	I <sub>GSS</sub>	V <sub>GS</sub> =±12V V <sub>DS</sub> =0V			±0.1	μA
On–State Drain Current	I <sub>D(on)</sub>	V <sub>GS</sub> =-4.5V V <sub>DS</sub> =-5V	-25			A
Gate Threshold Voltage	V <sub>GS(th)</sub>	V <sub>DS</sub> =V <sub>GS</sub> I <sub>D</sub> =-250μA	-0.7	-1	-1.3	V
Static Drain–Source On–Resistance	R <sub>DS(on)(1)</sub>	V <sub>GS</sub> =-10V I <sub>D</sub> =-4.2A		52	60	mΩ
	R <sub>DS(on)(2)</sub>	V <sub>GS</sub> =-10V I <sub>D</sub> =-4.2A T <sub>J</sub> =125°C			75	
	R <sub>DS(on)(3)</sub>	V <sub>GS</sub> =-4.5V I <sub>D</sub> =-4A		60	65	
	R <sub>DS(on)(4)</sub>	V <sub>GS</sub> =-2.5V I <sub>D</sub> =-1A		75	120	
Forward Transconductance	g <sub>FS</sub>	V <sub>DS</sub> =-5V I <sub>D</sub> =-5A	4	8		S
Drain–Source Diode Forward Voltage	V <sub>SD</sub>	V <sub>GS</sub> =0V I <sub>S</sub> =-1A		-0.75	-1.0	V

## 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 <sub>iss</sub>	V <sub>DS</sub> =-15V V <sub>GS</sub> =0V f=1MHz		957		pF
Output Capacitance	C <sub>oss</sub>			115		
Reverse Transfer Capacitance	C <sub>rss</sub>			77		
Gate resistance	R <sub>g</sub>	V <sub>GS</sub> =0V V <sub>DS</sub> =0V, f=1MHz		6		Ω
Total Gate Charge	Q <sub>g</sub>	V <sub>GS</sub> =-4.5V V <sub>DS</sub> =-15V I <sub>D</sub> =-4A		9.4		nC
Gate Source Charge	Q <sub>gs</sub>			2		
Gate Drain Charge	Q <sub>gd</sub>			3		
Turn-On Delay Time	t <sub>d(on)</sub>	V <sub>GS</sub> =-10V R <sub>L</sub> =3.6Ω V <sub>DS</sub> =-15V R <sub>GEN</sub> =6Ω		6.3		ns
Turn-On Rise Time	t <sub>r</sub>			3.2		
Turn-Off Delay Time	t <sub>d(off)</sub>			38.2		
Turn-Off Fall Time	t <sub>f</sub>			12		
Body Diode Reverse Recovery Time	t <sub>rr</sub>	I <sub>F</sub> =-4A, dI/dt=100A/μs		20.2		ns
Body Diode Reverse Recovery Charge	Q <sub>rr</sub>	I <sub>F</sub> =-4A, dI/dt=100A/μs		11.2		nC

A: The value of R<sub>θJA</sub> is measured with the device mounted on 1in<sup>2</sup> FR-4 board with 2oz. Copper, in a still air environment with T<sub>A</sub>=25°C. The value in any given application depends on the user's specific board design. The current rating is based on the t ≤ 10s thermal resistance rating.

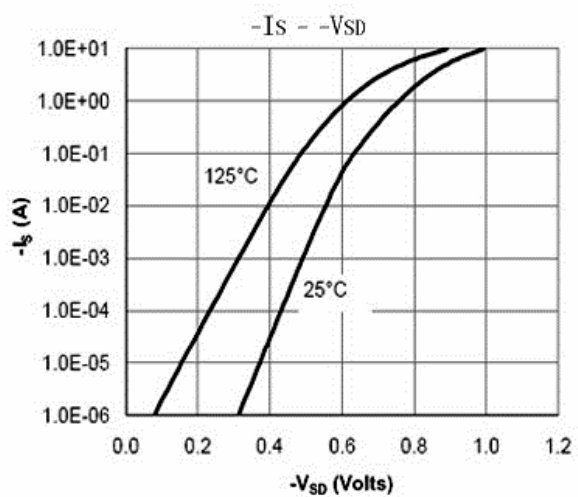
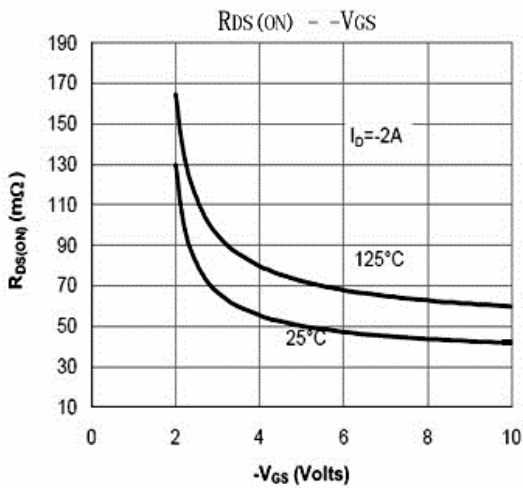
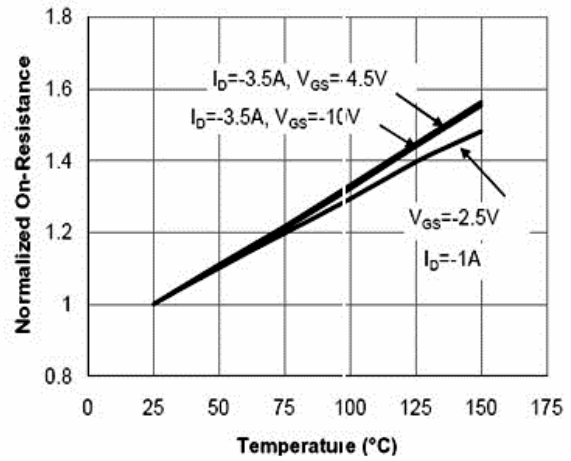
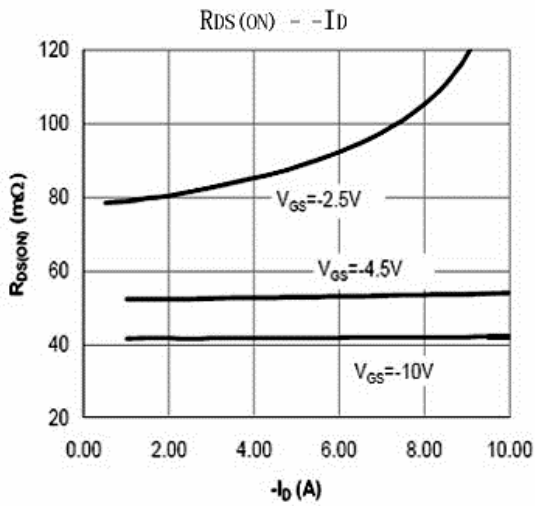
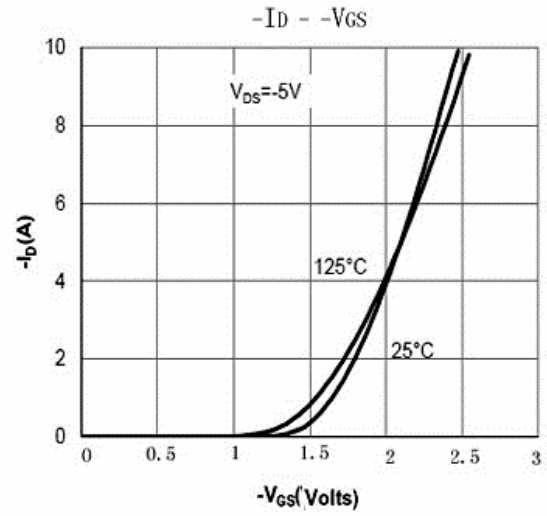
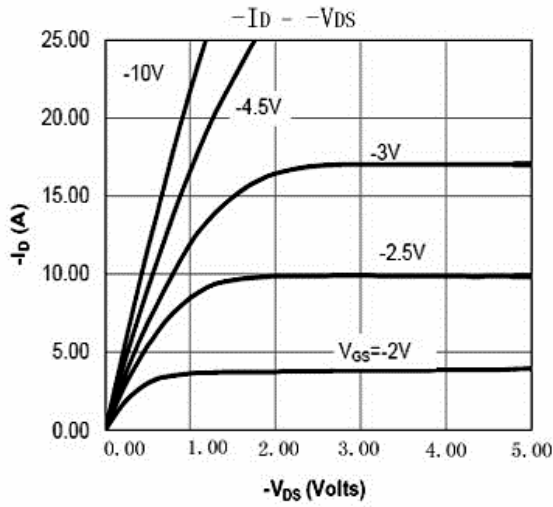
B: Repetitive rating, pulse width limited by junction temperature.

C. The R<sub>θJA</sub> is the sum of the thermal impedance from junction to lead R<sub>θJL</sub> and lead to ambient.

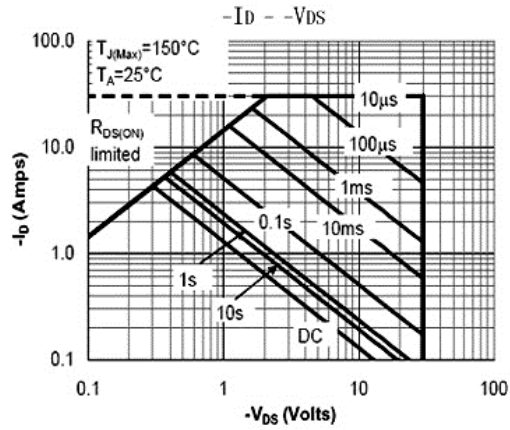
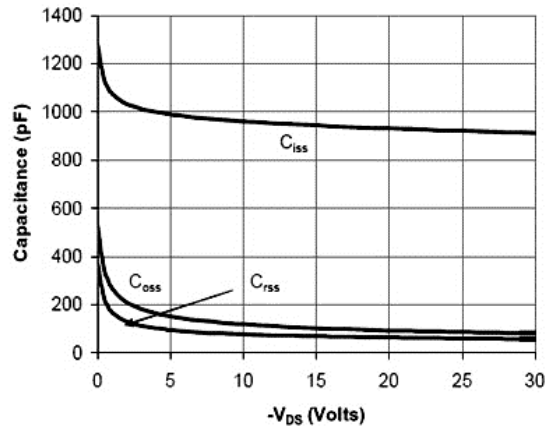
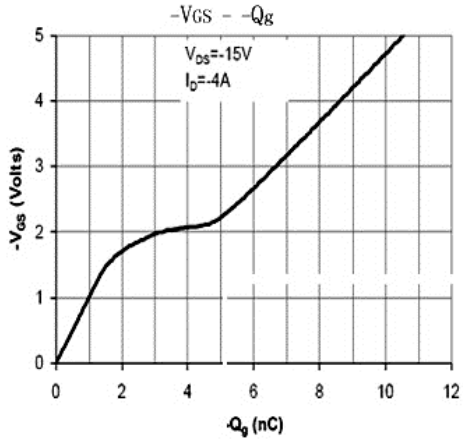
D. The static characteristics in Figures 1 to 6,12,14 are obtained using 80 μs pulses, duty cycle 0.5% max.

E. These tests are performed with the device mounted on 1 in<sup>2</sup> FR-4 board with 2oz. Copper, in a still air environment with T<sub>A</sub>=25°C. The SOA curve provides a single pulse rating.

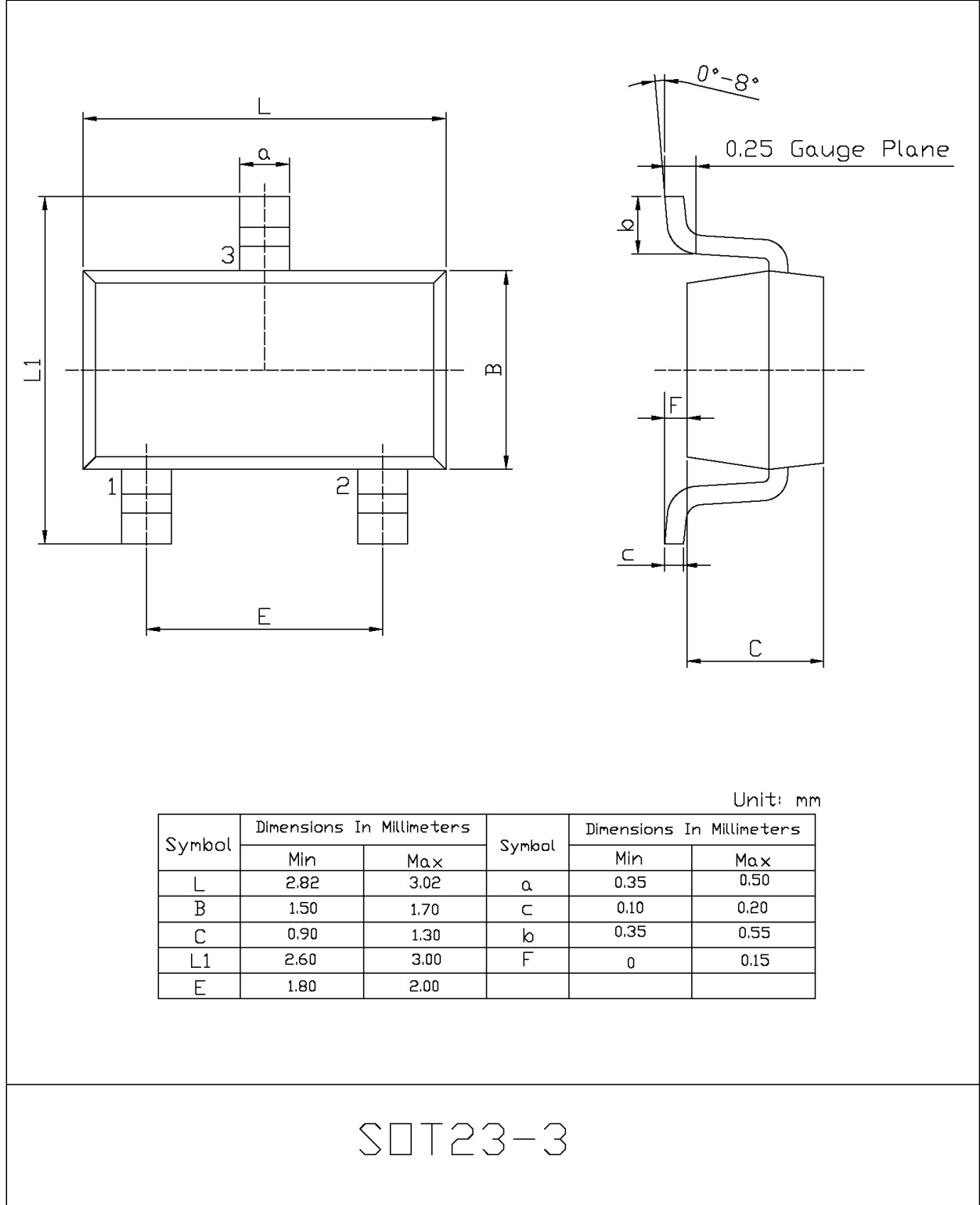
电参数曲线图 / Electrical Characteristic Curve



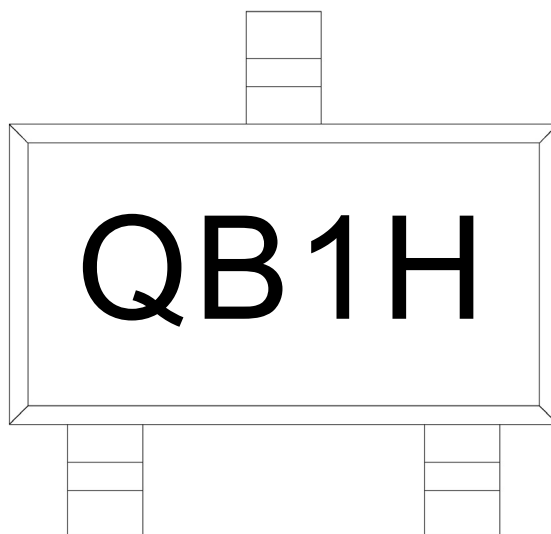
电参数曲线图 / Electrical Characteristic Curve



外形尺寸图 / Package Dimensions



印章说明 / Marking Instructions



说明：

Q： 为汽车无卤产品标识

B1： 为型号代码

H： 为公司代码

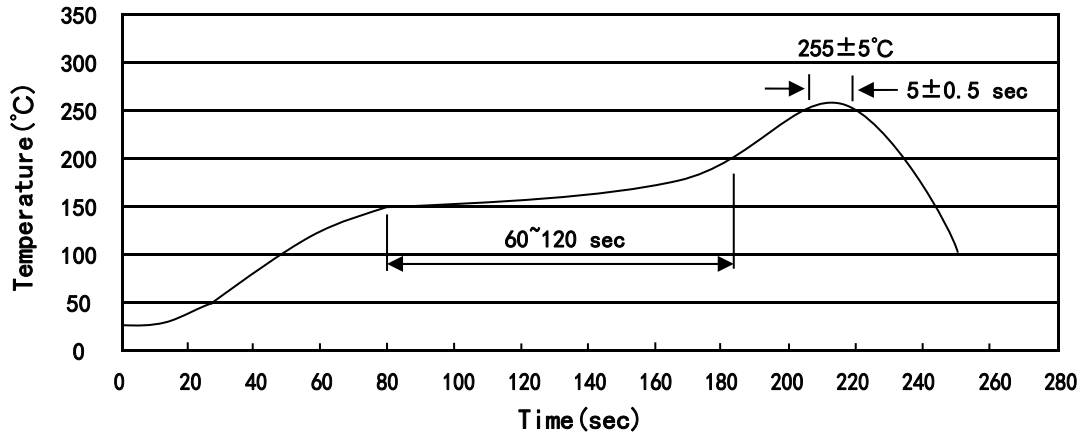
Note:

Q: Automobile halogen-free product Code

B1: Product Type Code

H: Company Code

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



说明：

Note:

- |                                    |  |
|------------------------------------|--|
| 1、预热温度 150 ~ 200°C，时间 60 ~ 120sec; | 1.Preheating:150~200°C, Time:60~120sec.  |
| 2、峰值温度 255±5°C，时间持续为 5±0.5sec;     | 2.Peak Temp.:255±5°C, Duration:5±0.5sec. |
| 3、焊接制程冷却速度为 2 ~ 10°C/sec.          | 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
SOT23-3	3,000	10	30,000	4	120,000	7" ×8	210×205×205	445×230×435

**使用说明 / Notices**