

BRMMDT2227WSQ

Rev.A Jan.-2024

描述 / Descriptions

SOT-363 塑封封装双 NPN+PNP 半导体三极管。

Double silicon NPN and PNP transistor in a SOT-363 Plastic Package.

特征 / Features

理想的低功率放大和开关，符合 AEC-Q101 标准高可靠性要求，无卤产品。

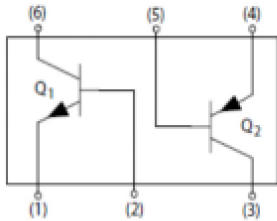
Ideal for Low Power Amplification and Switching, Qualified to AEC-Q101 Standards for High Reliability, HF Product.

用途 / Applications

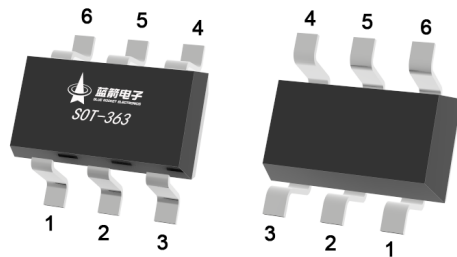
用于功率放大电路，满足汽车应用的严格要求。

Power amplifier application, Meet the stringent requirements of automotive applications.

内部等效电路 / Equivalent Circuit



引脚排列 / Pinning



Pin 1: E2

Pin 2: B2

Pin 3: C1

Pin 4: E1

Pin 5: B1

Pin 6: C2

放大及印章代码 / hFE Classifications & Marking

见印章说明。

See Marking Instructions.

极限参数 / Maximum Ratings, Total Device @ $T_A = 25^\circ\text{C}$ unless otherwise specified

参数 Parameter	符号 Symbol	数值 Rating	单位 Unit
Total Power Dissipation	P_d	200	mW
Thermal Resistance, Junction to Ambient	$R_{\theta JA}$	625	$^\circ\text{C}/\text{W}$
Operating and Storage and Temperature Range	T_j, T_{STG}	-55~150	$^\circ\text{C}$

极限参数 / Absolute Maximum Ratings($T_a=25^\circ\text{C}$) (NPN , 2222A)

参数 Parameter	符号 Symbol	数值 Rating	单位 Unit
Collector to Base Voltage	V_{CBO}	75	V
Collector to Emitter Voltage	V_{CEO}	40	V
Emitter to Base Voltage	V_{EBO}	6.0	V
Collector Current	I_C	600	mA

极限参数 / Absolute Maximum Ratings($T_a=25^\circ\text{C}$) (PNP , 2907A)

参数 Parameter	符号 Symbol	数值 Rating	单位 Unit
Collector to Base Voltage	V_{CBO}	-60	V
Collector to Emitter Voltage	V_{CEO}	-60	V
Emitter to Base Voltage	V_{EBO}	-5.0	V
Collector Current	I_C	-600	mA

电性能参数 / Electrical Characteristics(Ta=25°C) (NPN , 2222A)

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
Collector-Base Breakdown Voltage	V _{CBO}	I _C = 10μA I _E = 0	75			V
Collector-Emitter Breakdown Voltage	V _{CEO}	I _C = 10mA I _B = 0	40			V
Emitter-Base Breakdown Voltage	V _{EBO}	I _E = 10μA I _C = 0	6.0			V
Collector Cut-Off Current	I _{CEX}	V _{CE} = 60V V _{EB(off)} = 3V			10	nA
Collector Cut-Off Current	I _{CBO}	V _{CB} = 60V I _E = 0			0.01	μA
		V _{CB} = 60V I _E = 0 T _A = 125°C			10	μA
Emitter Cut-Off Current	I _{EBO}	V _{EB} = 3.0V I _C = 0			10	nA
Base Cut-Off Current	I _{BL}	V _{CE} = 60V V _{EB(off)} = 3V			20	nA
DC Current Gain	h _{FE(1)}	V _{CE} = 10V I _C = 0.1mA	35			
	h _{FE(2)}	V _{CE} = 10V I _C = 1.0mA	50			
	h _{FE(3)}	V _{CE} = 10V I _C = 10mA	75			
	h _{FE(4)}	V _{CE} = 10V I _C = 10mA T _A = -55°C	50			
	h _{FE(5)}	V _{CE} = 10V I _C = 150mA	100		300	
	h _{FE(6)}	V _{CE} = 1.0V I _C = 150mA	35			
	h _{FE(7)}	V _{CE} = 10V I _C = 500mA	40			
Collector-Emitter Saturation Voltage	V _{CE(sat) (1)}	I _C = 150mA I _B = 15mA			0.3	V
	V _{CE(sat) (2)}	I _C = 500mA I _B = 50mA			1.0	V
Base-Emitter Saturation Voltage	V _{BE(sat) (1)}	I _C = 150mA I _B = 15mA	0.6		1.2	V
	V _{BE(sat) (2)}	I _C = 500mA I _B = 50mA			2.0	V
Transition Frequency(Note 3)	f _T	V _{CE} = 20V I _C = 20mA f = 100MHz	300			MHz
Output Capacitance	C _{obo}	V _{CB} = 10V I _E = 0 f = 1.0MHz			8.0	pF
Input Capacitance	C _{ibo}	V _{EB} = 0.5V I _C = 0 f = 1.0MHz			25	
Noise Figure	NF	I _C = 100μA V _{CE} = 10V R _S = 1.0kΩ f = 1.0 kHz			4.0	dB
Turn-on Time	t _d	V _{CC} = 30V I _C = 150mA V _{BE(OFF)} = -0.5V			10	ns
Storage Time	t _r	I _{B1} = 15mA			25	ns
	t _s	V _{CC} = 30V I _C = 150mA			225	ns
Fall Time	t _f	I _{B1} = I _{B2} = 15mA			60	ns

电性能参数 / Electrical Characteristics(Ta=25°C) (PNP , 2907A)

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
Collector to Base Breakdown Voltage	V _{CB0}	I _C =-10μA I _E =0	-60			V
Collector to Emitter Breakdown Voltage	V _{CEO}	I _C =-10mA I _B =0	-60			V
Emitter to Base Breakdown Voltage	V _{EBO}	I _E =-10μA I _C =0	-5.0			V
Collector Cut-Off Current	I _{CB0}	V _{CB} =-50V I _E =0			-0.01	μA
	I _{CB0}	V _{CB} =-50V I _E =0 T _A =125°C			10	μA
Collector Cutoff Curren	I _{CEX}	V _{CE} = -30V, V _{EB(OFF)} = -0.5V			-50	nA
Base Cutoff Current	I _{BL}	V _{CE} = -30V, V _{EB(OFF)} = -0.5V			-50	nA
DC Current Gain	h _{FE(1)}	V _{CE} =-10V I _C =-150mA*	100		300	
	h _{FE(2)}	V _{CE} =-10V I _C =-500mA*	50			
	h _{FE(3)}	V _{CE} =-10V I _C =-10mA	100			
	h _{FE(4)}	V _{CE} =-10V I _C =-1.0mA	100			
	h _{FE(5)}	V _{CE} =-10V I _C =-0.1mA	75			
Collector-Emitter Saturation Voltage	V _{CE(sat) (1)}	I _C =-150mA I _B =-15 mA			-0.4	V
	V _{CE(sat) (2)}	I _C =-500mA I _B =-50mA			-1.6	V
Base-Emitter Saturation Voltage	V _{BE(sat) (1)}	I _C =-150mA I _B =-15 mA			-1.3	V
	V _{BE(sat) (2)}	I _C =-500mA I _B =-50mA			-2.6	V
Transition Frequency	f _T	V _{CE} =-20V I _C =-50mA f=100MHz	200			MHz
Output Capacitance	C _{obo}	V _{CB} =-10V I _E =0 f=1.0MHz			8.0	pF
Input Capacitanc	C _{ibo}	V _{EB} =-2V I _C =0 f=1.0MHz			30	
Turn-On Time	t _{on}				45	ns
Delay Time	t _d	V _{CC} =-30V I _C =-150mA			10	
Rise Time	t _r	I _{B1} =-15mA			40	
Storage Time	t _s	V _{CC} =-6V I _C =-150mA			80	
Fall Time	t _r	I _{B1} =I _{B1} =-15mA			30	
Turn-Off Time	t _{off}				100	ns

*Pulse Test: Pulse Width ≤ 300 μs, Duty Cycle ≤ 2.0%

电参数曲线图 / Electrical Characteristic Curve

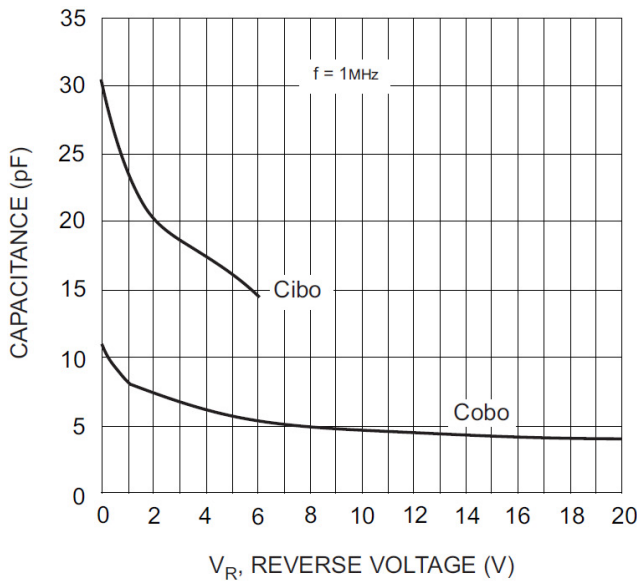


Fig. 1, Typical Capacitance Characteristics (2222A Type - NPN)

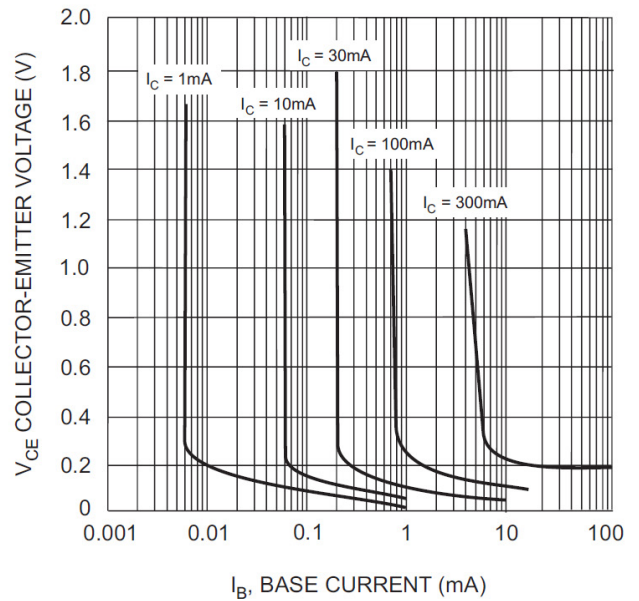


Fig. 2, Typical Collector Saturation Region (2222A Type - NPN)

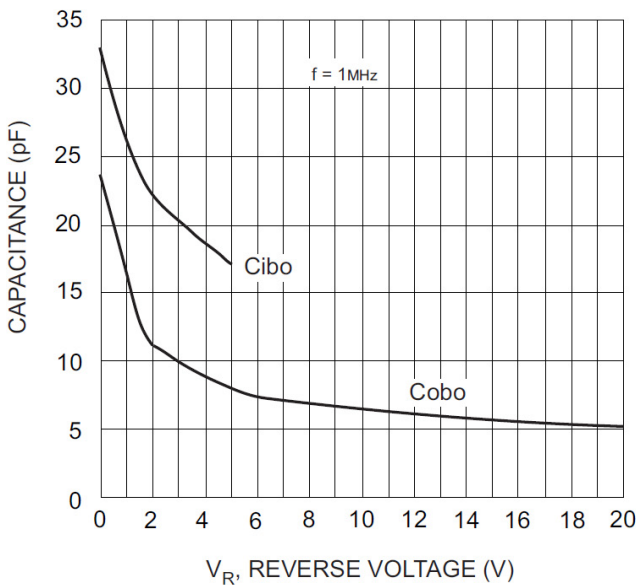


Fig. 3, Typical Capacitance Characteristics (2907A Type - PNP)

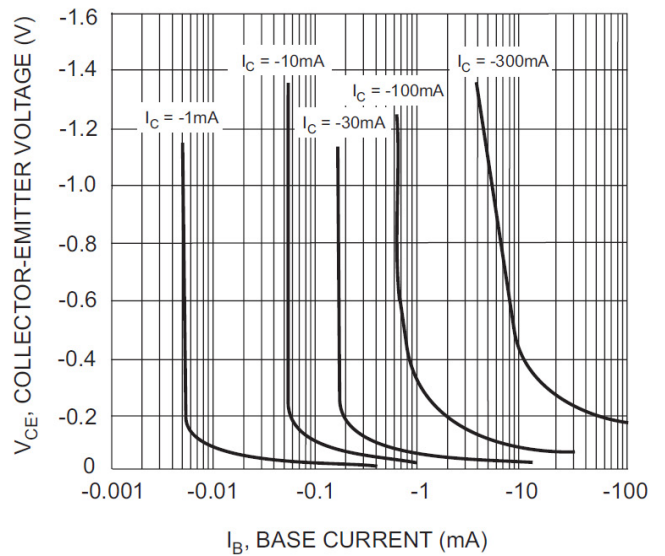
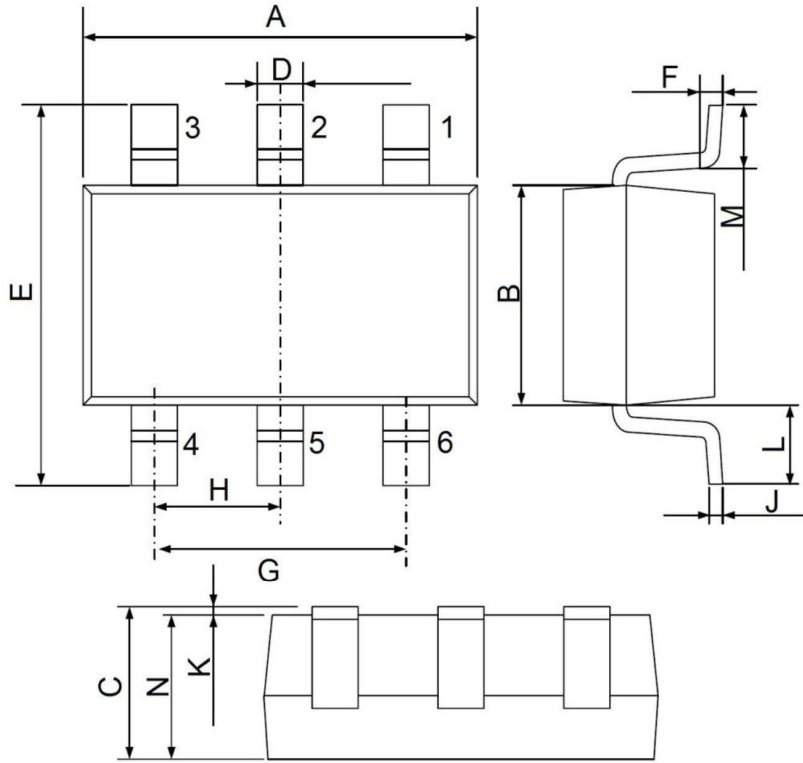


Fig. 4, Typical Collector Saturation Region (2907A Type - PNP)

外形尺寸图 / Package Dimensions

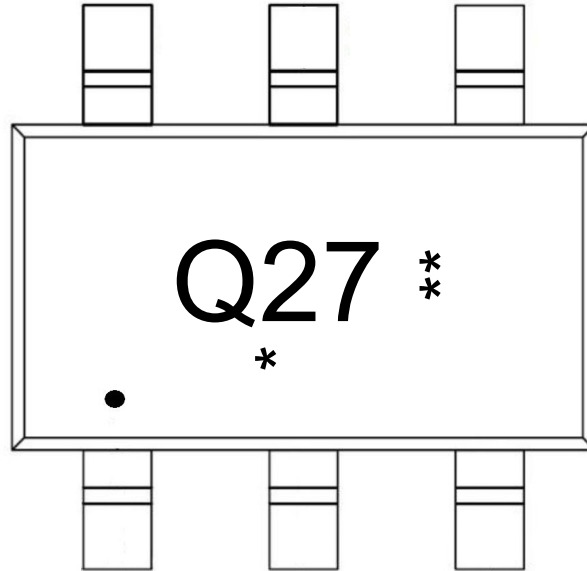
SOT-363-6L



UNIT: mm

DIM	MIN	MAX
A	2.00	2.20
B	1.15	1.35
C	0.90	1.10
D	0.15	0.35
E	1.95	2.25
F	0.20 Typ.	
G	1.20	1.40
H	0.65 Typ.	
J	0.08	0.15
K	0.00	0.10
L	0.525 Ref.	
M	0.26	0.46
N	0.90	1.10

印章说明 / Marking Instructions

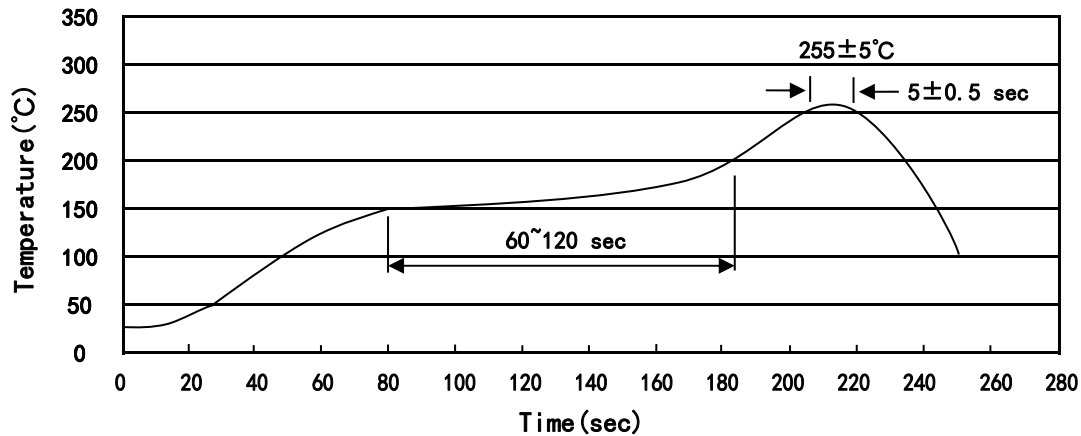


说明：

- ：为“1”脚
- Q：为汽车无卤产品标识
- 27：为型号代码
- ***：为生产批号代码，随生产批号变化

Note:

- ：“1” Pin
- Q: Automobile halogen-free product Code
- 27：Product Type Code
- ***: 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 150~200°C，时间 60~120sec;
- 2、峰值温度 255±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:150~200°C, Time:60~120sec.
- 2.Peak Temp.:255±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
SOT-363	3,000	10	30,000	6	180,000	7" ×8	180×120×180	390×385×205

使用说明 / Notices