Descriptions

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

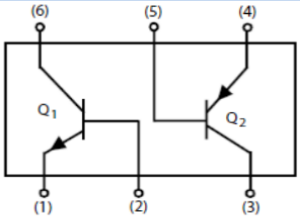
Features

High DC Current Gain, Low Collector to Emitter Saturation Voltage.

Applications

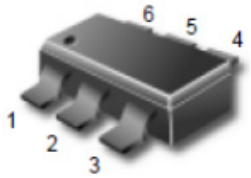
General purpose amplifier and switching.

Equivalent Circuit



Q1: NPN Q2: PNP

Pinning



PIN 1、4：Emitter PIN 2、5：Base PIN 3、6：Collector

h_{FE} Classifications & Marking

See Marking Instructions.

Absolute Maximum Ratings(Ta=25℃) (NPN)

Parameter	Symbol	Rating	Unit
Collector to Base Voltage	V_{CBO}	60	V
Collector to Emitter Voltage	V_{CEO}	40	V
Emitter to Base Voltage	V_{EBO}	6.0	V
Collector Current	I_C	200	mA
Collector Power Dissipation	P_C	200	mW
	*P_C	350	mW
Thermal Resistance Junction to Ambient	$R_{\theta JA}$	625	℃/W
Junction Temperature	T_j	150	℃
Storage Temperature Range	T_{stg}	-55～150	℃

Absolute Maximum Ratings(Ta=25℃) (PNP)

Parameter	Symbol	Rating	Unit
Collector to Base Voltage	V_{CBO}	-40	V
Collector to Emitter Voltage	V_{CEO}	-40	V
Emitter to Base Voltage	V_{EBO}	-5.0	V
Collector Current	I_C	-200	mA
Collector Power Dissipation	P_C	300	mW
Thermal Resistance Junction to Ambient	$R_{\theta JA}$	625	℃/W
Junction Temperature	T_j	150	℃
Storage Temperature Range	T_{stg}	-55～150	℃

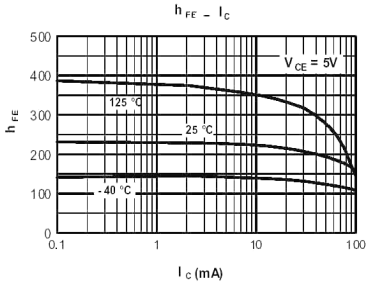
Electrical Characteristics(Ta=25℃) (NPN)

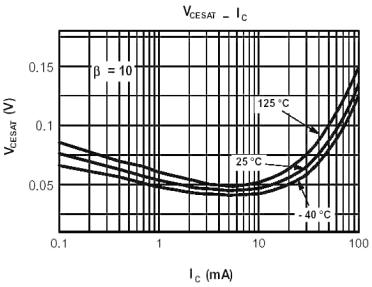
Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Collector to Base Breakdown Voltage	V_{CBO}	I_C=10μA I_E=0	60			V
Collector to Emitter Breakdown Voltage	V_{CEO}	I_C=1.0mA I_B=0	40			V
Emitter to Base Breakdown Voltage	V_{EBO}	I_E=10μA I_C=0	6.0			V
Collector Cut-Off Current	I_{CBO}	V_{CB}=30V I_E=0			0.05	μA
Emitter Cut-Off Current	I_{EBO}	V_{EB}=3.0V I_C=0			0.05	μA
DC Current Gain	$h_{FE(1)}$	V_{CE}=1.0V I_C=10mA	100		300	
	$h_{FE(2)}$	V_{CE}=1.0V I_C=100mA	30			
	$h_{FE(3)}$	V_{CE}=1.0V I_C=50mA	60			
	$h_{FE(4)}$	V_{CE}=1.0V I_C=1.0mA	70			
	$h_{FE(5)}$	V_{CE}=1.0V I_C=0.1mA	40			
Collector-Emitter Saturation Voltage	$V_{CE(sat)(1)}$	I_C=10mA I_B=1.0mA			0.2	V
	$V_{CE(sat)(2)}$	I_C=50mA I_B=5.0mA			0.3	V
Base-Emitter Saturation Voltage	$V_{BE(sat)(1)}$	I_C=10mA I_B=1.0mA	0.65		0.85	V
	$V_{BE(sat)(2)}$	I_C=50mA I_B=5.0mA			0.95	V
Transition Frequency	f_T	V_{CE}=20V I_C=10mA f=100MHz	300			MHz
Output Capacitance	C_{ob}	V_{CB}=5.0V f=1.0MHz			4.0	pF
Storage Time	t_{stg}	V_{CC}=3.0V I_C=10mA I_{B1}=-I_{B2}=1.0mA			200	ns
Fall Time	t_f	V_{CC}=3.0V I_C=10mA I_{B1}=-I_{B2}=1.0mA			50	ns
Delay Time	t_d	V_{CC}=3.0V V_{BE}=0.5V I_C=10mA I_{B1}=1.0mA			35	ns
Rise Time	t_r	V_{CC}=3.0V V_{BE}=0.5V I_C=10mA I_{B1}=1.0mA			35	ns
Input Capacitance	C_{ib}	V_{EB}=0.5V f=1.0MHz			8.0	pF

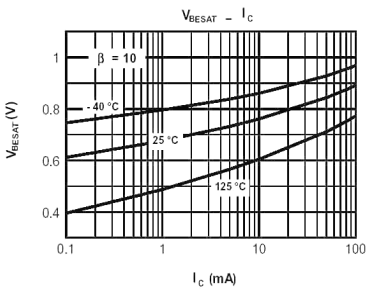
Electrical Characteristics(Ta=25℃) (PNP)

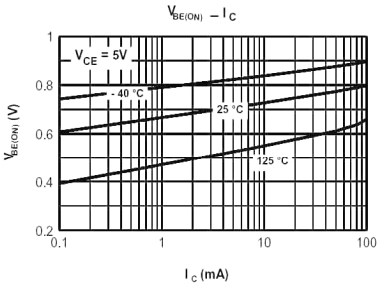
Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Collector to Base Breakdown Voltage	V_{CBO}	I_C=-10μA I_E=0	-40			V
Collector to Emitter Breakdown Voltage	V_{CEO}	I_C=-1.0mA I_B=0	-40			V
Emitter to Base Breakdown Voltage	V_{EBO}	I_E=-10μA I_C=0	-5.0			V
Collector Cut-Off Current	I_{CBO}	V_{CB}=-30V I_E=0			-0.05	μA
Emitter Cut-Off Current	I_{EBO}	V_{EB}=-3.0V I_C=0			-0.05	μA
DC Current Gain	$h_{FE(1)}$	V_{CE}=-1.0V I_C=-10mA	100		300	
	$h_{FE(2)}$	V_{CE}=-1.0V I_C=-100mA	30			
	$h_{FE(3)}$	V_{CE}=-1.0V I_C=-50mA	60			
	$h_{FE(4)}$	V_{CE}= -1.0V I_C=-1.0mA	80			
	$h_{FE(5)}$	V_{CE}=-1.0V I_C=-0.1mA	60			
Collector-Emitter Saturation voltage	$V_{CE(sat)\ (1)}$	I_C=-10mA I_B=-1.0mA			-0.25	V
	$V_{CE(sat)\ (2)}$	I_C=-50mA I_B=-5.0mA			-0.4	V
Base-Emitter Saturation Voltage	$V_{BE(sat)\ (1)}$	I_C=-10mA I_B=-1.0mA	-0.65		-0.85	V
	$V_{BE(sat)\ (2)}$	I_C=-50mA I_B=-5.0mA			-0.95	V
Transition Frequency	f_T	V_{CE}=-20V I_C=-10mA f=100MHz	250			MHz
Output Capacitance	C_{ob}	V_{CB}=-5.0V f=1.0MHz			4.5	pF
Storage Time	t_{stg}	V_{CC}=-3.0V I_C=-10mA I_{B1}=-I_{B2}=-1.0mA			225	ns
Fall Time	t_f	V_{CC}=-3.0V I_C=-10mA I_{B1}=-I_{B2}=-1.0mA			75	ns
Delay Time	t_d	V_{CC}=-3.0V V_{BE}=-0.5V I_C=-10mA I_{B1}=-1.0mA			35	ns
Rise Time	t_r	V_{CC}=-3.0V V_{BE}=-0.5V I_C=-10mA I_{B1}=-1.0mA			35	ns
Input Capacitance	C_{ib}	V_{EB}=-0.5V f=1.0MHz			10	pF

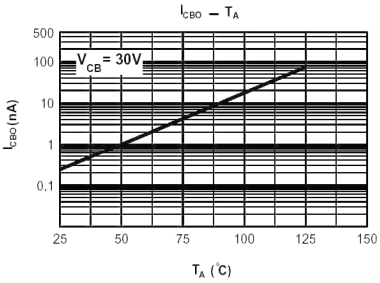
Electrical Characteristic Curve (NPN)

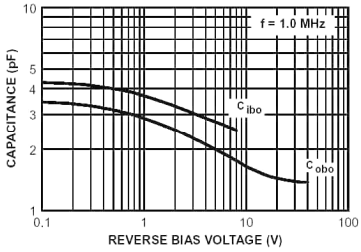


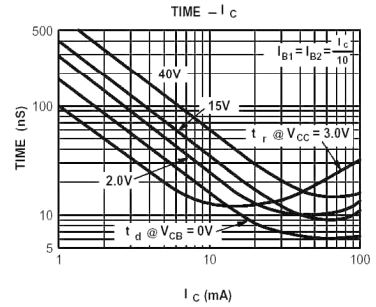


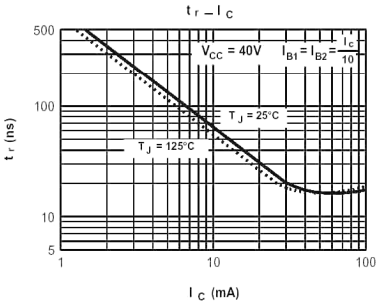


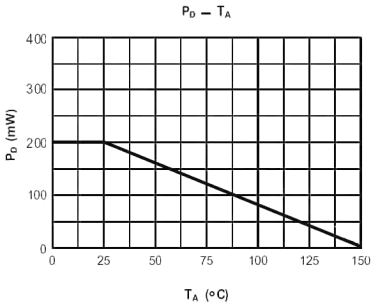




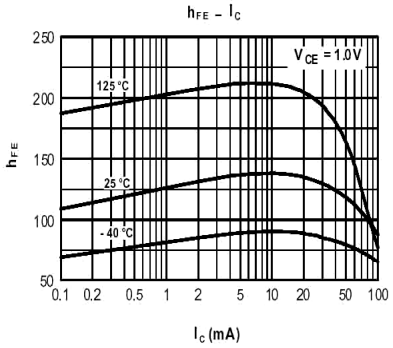


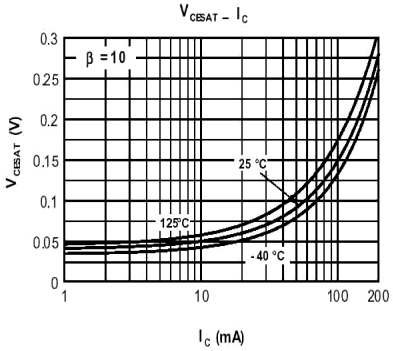


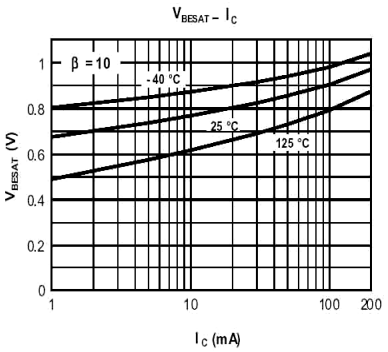


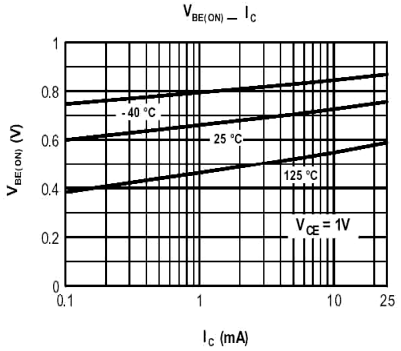


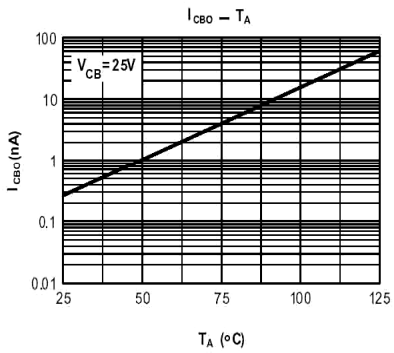
Electrical Characteristic Curve (PNP)

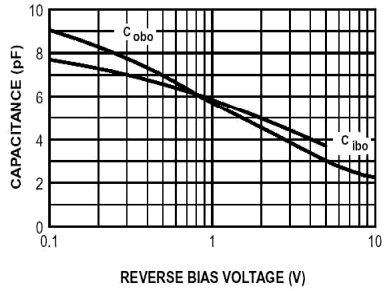


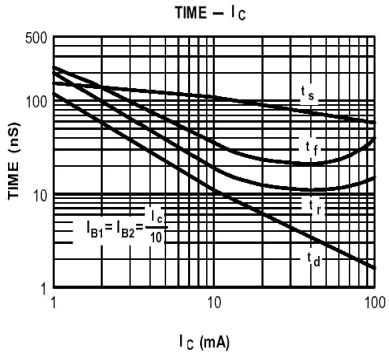


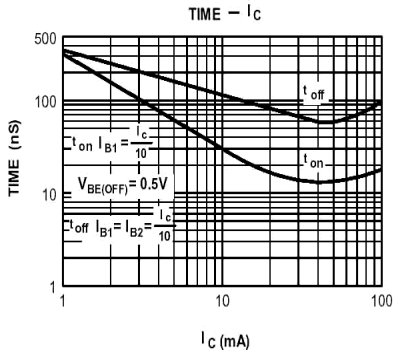


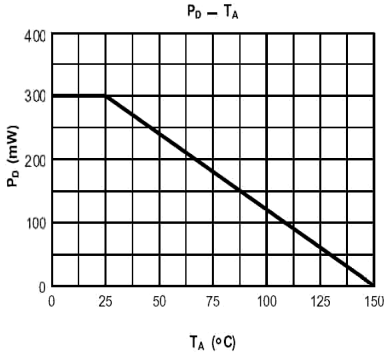






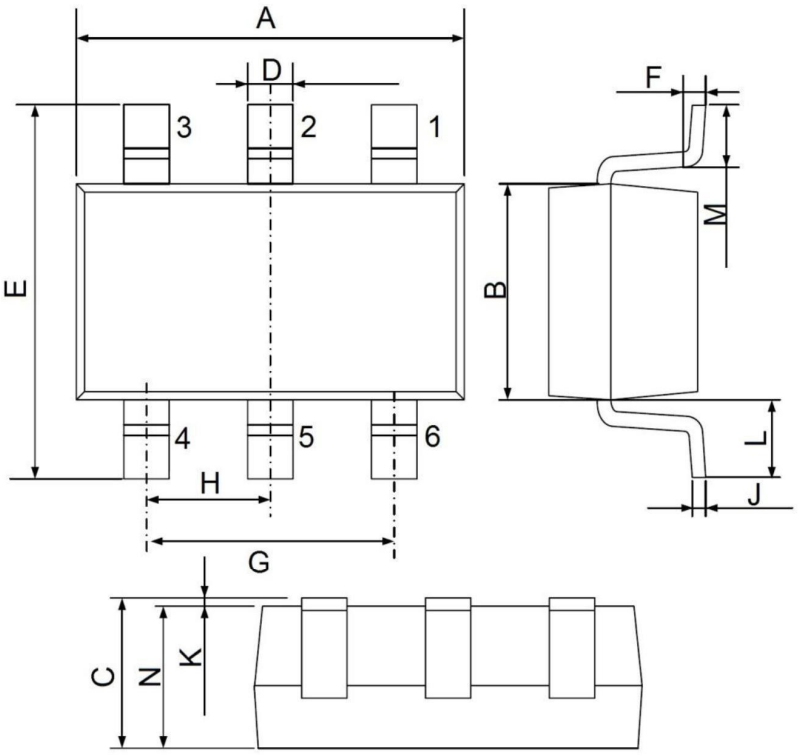






Package Dimensions

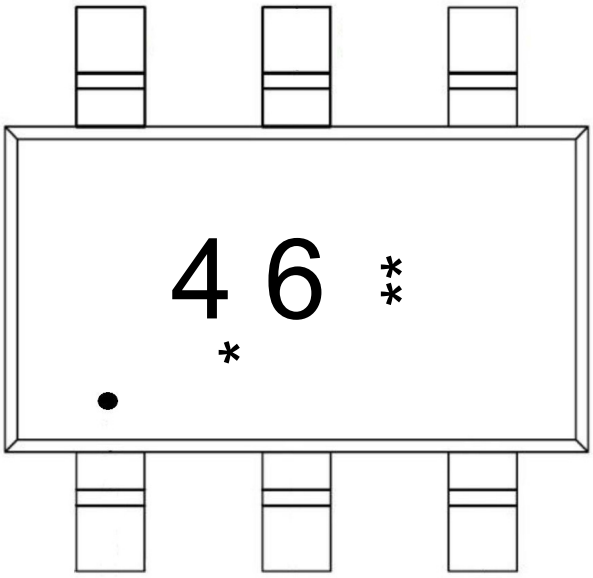
SOT-363



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	2.15	2.45
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	1.00

Marking Instructions



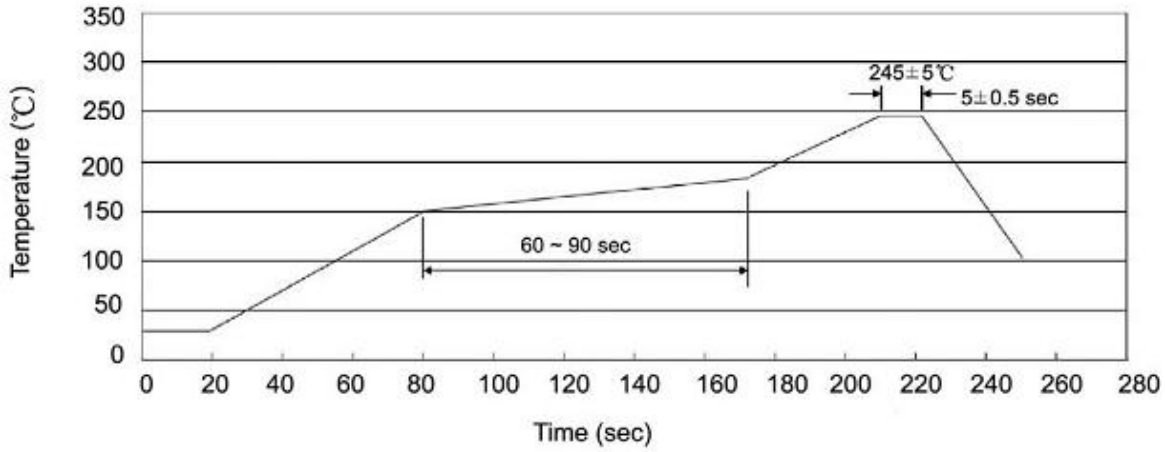
Note:

●： "1" Pin

46： Product Type Code

***: Lot No. Code, code change with Lot No.

Temperature Profile for IR Reflow Soldering(Pb-Free)



Note:

1.Preheating:150~180℃, Time:60~90sec.

2.Peak Temp.:245±5℃, Duration:5±0.5sec.

3. Cooling Speed: 2~10℃/sec.

Resistance to Soldering Heat Test Conditions

Temp.:260±5℃ Time:10±1 sec