

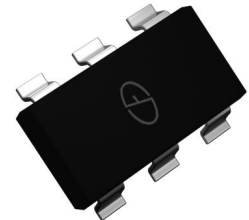
NPN+PNP Dual Transistors

Features

- Epitaxial planar die construction
- Power Dissipation of 200mW
- Two internal isolated NPN/PNP transistors in one package
- RoHS Compliant



RoHS
COMPLIANT



Marking: .7P

SOT-363



Applications

- General purpose small signal amplifier

Mechanical Data

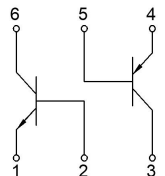
- Package: SOT-363
- Lead Finish: Matte Tin
- Case Material: "Green" Molding Compound
- UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 3 per J-STD-020

Pin definition

Equivalent circuit



2.5: Base
1.4: Emitter
3.6: Collector



Maximum Ratings & Electrical Characteristics (T_A=25°C unless otherwise noted)

Parameter	Symbol	Value		Unit
		TR1	TR2	
Collector-Base Voltage	VCBO	50	-50	V
Collector-Emitter Voltage	VCEO	45	-45	V
Emitter-Base Voltage	VEBO	6	-5	V
Collector Current Continuous	I _C	100	-100	mA
Collector Power Dissipation	P _D	200		mW
Operating Junction temperature	T _J	-55 to +150		°C
Storage Temperature Range	T _{STG}	-55 to +150		°C

TR1 NPN Electrical Specifications($T_A=25^{\circ}\text{C}$ unless otherwise noted)

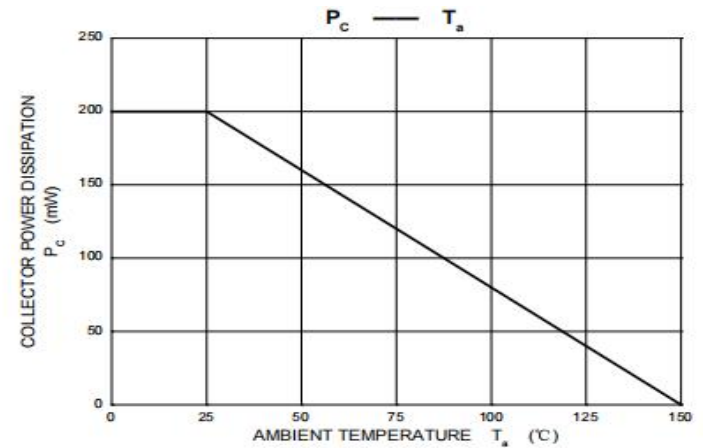
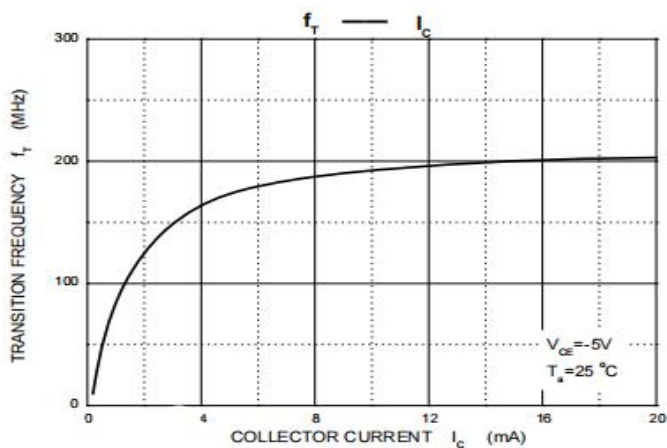
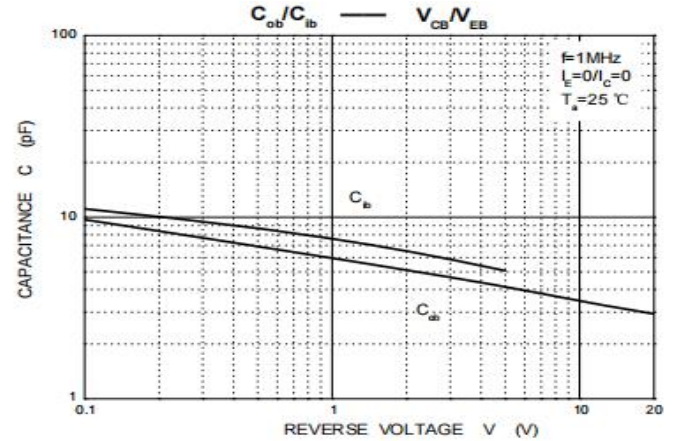
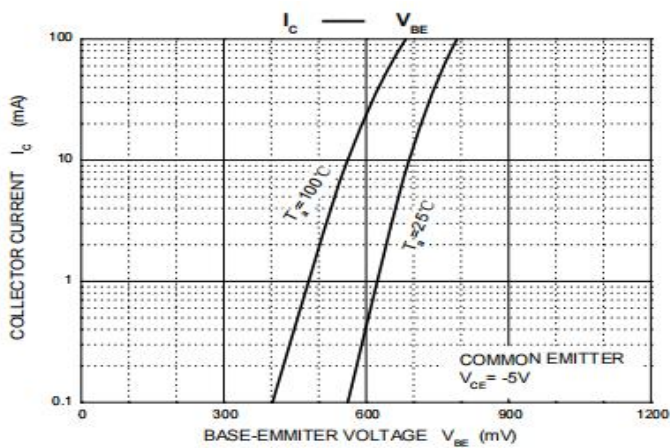
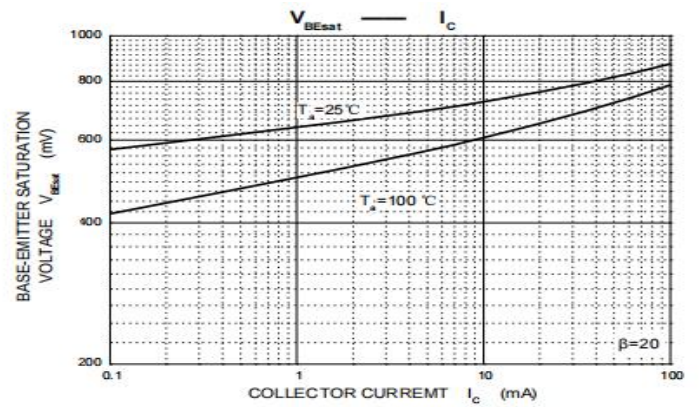
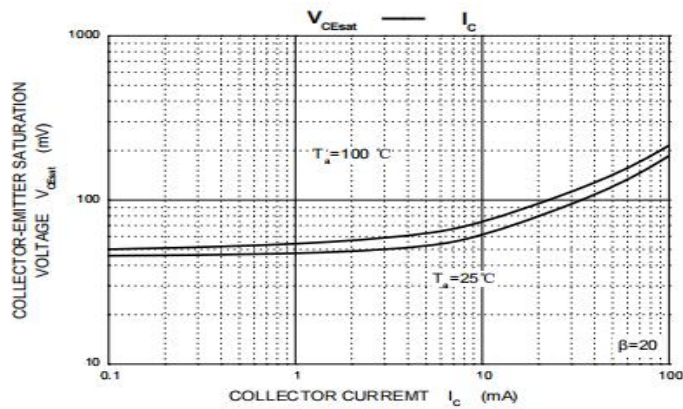
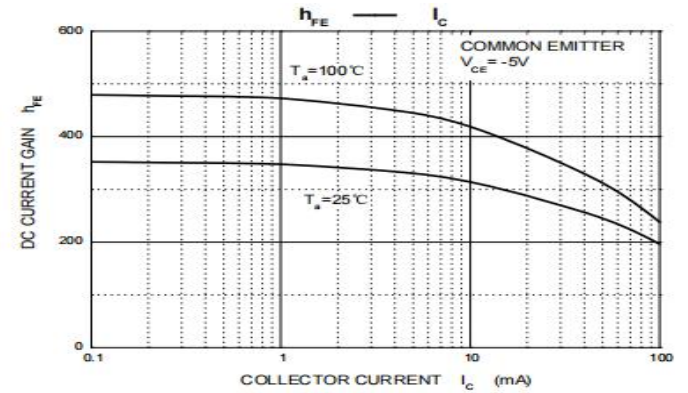
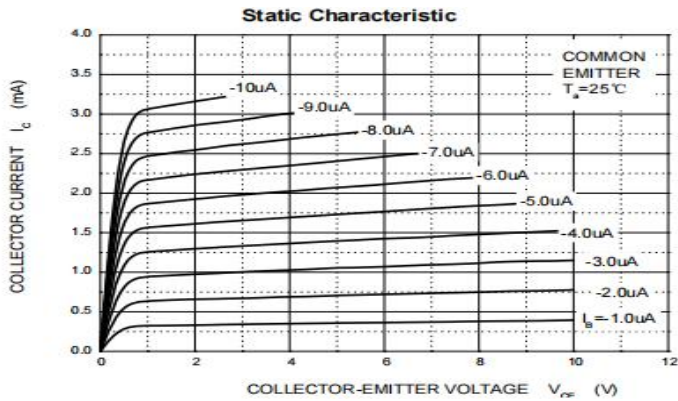
Parameter	Symbol	Test Conditions	Limit			Unit
			Min	Typ	Max	
Collector-BaseBreakdown Voltage	$V_{(BR)CBO}$	$I_C = 10\mu\text{A}, I_E = 0$	50			V
Collector-EmitterBreakdown Voltage	$V_{(BR)CEO}$	$I_C = 10\text{mA}, I_B = 0$	45			V
Emitter-BaseBreakdown Voltage	$V_{(BR)EBO}$	$I_E = 1\mu\text{A}, I_C = 0$	6			V
Collector Cut-off Current	I_{CBO}	$V_{CB} = 30\text{V}, I_E = 0$			15	nA
Emitter cut-off current	I_{EBO}	$V_{EB}=5\text{V}, I_C=0$			15	nA
DC Current Gain	h_{FE}	$V_{CE} = 5\text{V}, I_C = 2\text{mA}$	200		450	
Collector-EmitterSaturation Voltage	$V_{CE(sat)}$	$I_C = 10\text{mA}, I_B = 0.5\text{mA}$			0.25	V
		$I_C = 100\text{mA}, I_B = 5\text{mA}$			0.60	V
Base-EmitterSaturation Voltage	$V_{BE(sat)}$	$I_C = 10\text{mA}, I_B = 0.5\text{mA}$		0.7		V
		$I_C = 100\text{mA}, I_B = 5\text{mA}$		0.9		V
Base-Emitter Voltage	$V_{BE(ON)}$	$V_{CE} = 5\text{V}, I_C = 2\text{mA}$	0.58		0.70	V
		$V_{CE} = 5\text{V}, I_C = 10\text{mA}$			0.72	V
Transition frequency	f_T	$V_{CE}=5\text{V}, I_C=10\text{mA}$ $f=100\text{MHz}$	100			MHz
Collector output capacitance	C_{ob}	$V_{CB} = 10\text{V}, f = 1.0\text{MHz}$			6.0	pF
Noise Figure	N_F	$V_{CE} = 5\text{V}, f=1.0\text{KHz}$ $I_C=200\text{mA}, R_G = 2\text{k}\Omega$			10	dB

TR2 PNP Electrical Specifications($T_A=25^{\circ}\text{C}$ unless otherwise noted)

Parameter	Symbol	Test Conditions	Limit			Unit
			Min	Typ	Max	
Collector-BaseBreakdown Voltage	$V_{(BR)CBO}$	$I_C = -10\mu\text{A}, I_E = 0$	-50			V
Collector-EmitterBreakdown Voltage	$V_{(BR)CEO}$	$I_C = -10\text{mA}, I_B = 0$	-45			V
Emitter-BaseBreakdown Voltage	$V_{(BR)EBO}$	$I_E = -1\mu\text{A}, I_C = 0$	-5			V
Collector Cut-off Current	I_{CBO}	$V_{CB} = -30\text{V}, I_E = 0$			-15	nA
Emitter cut-off current	I_{EBO}	$V_{EB}=-5\text{V}, I_C=0$			-15	nA
DC Current Gain	h_{FE}	$V_{CE} = -5\text{V}, I_C = -2\text{mA}$	220		475	
Collector-EmitterSaturation Voltage	$V_{CE(sat)}$	$I_C = -10\text{mA}, I_B = -0.5\text{mA}$			-0.3	V
		$I_C = -100\text{mA}, I_B = -5\text{mA}$			-0.65	V
Base-EmitterSaturation Voltage	$V_{BE(sat)}$	$I_C = -10\text{mA}, I_B = -0.5\text{mA}$		-0.70		V
		$I_C = -100\text{mA}, I_B = -5\text{mA}$			-0.95	V
Base-Emitter Voltage	$V_{BE(ON)}$	$V_{CE} = -5\text{V}, I_C = -2\text{mA}$	-0.6		-0.75	V
		$V_{CE} = -5\text{V}, I_C = -10\text{mA}$			-0.82	V
Transition frequency	f_T	$V_{CE}=-5\text{V}, I_C=-10\text{mA}$ $f=100\text{MHz}$	100			MHz
Collector output capacitance	C_{ob}	$V_{CB} = -10\text{V}, f = 1.0\text{MHz}$			4.5	pF
Noise Figure	N_F	$V_{CE} = -5\text{V}, f=1.0\text{KHz}$ $I_C = -200\text{mA}, R_G = -2\text{k}\Omega$			10	dB

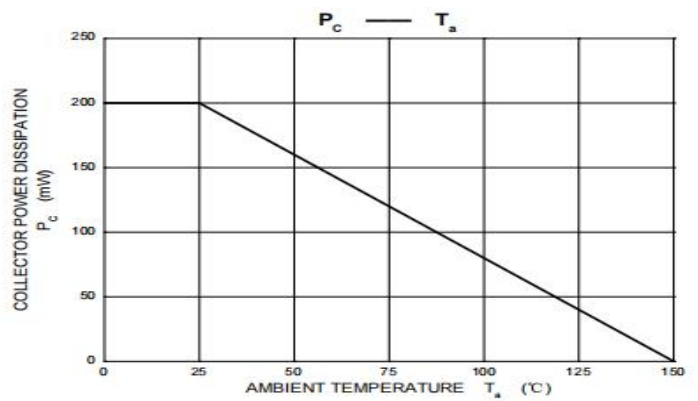
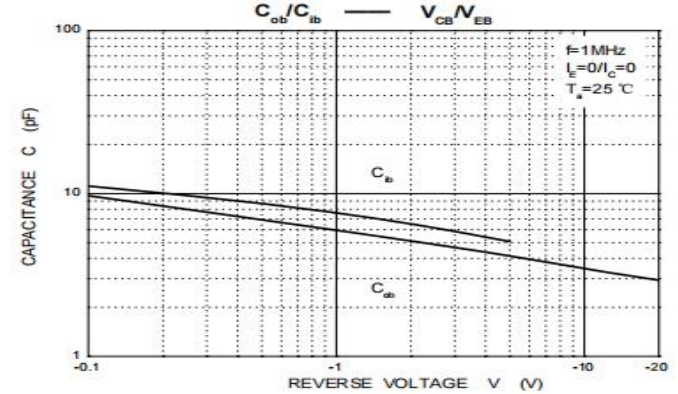
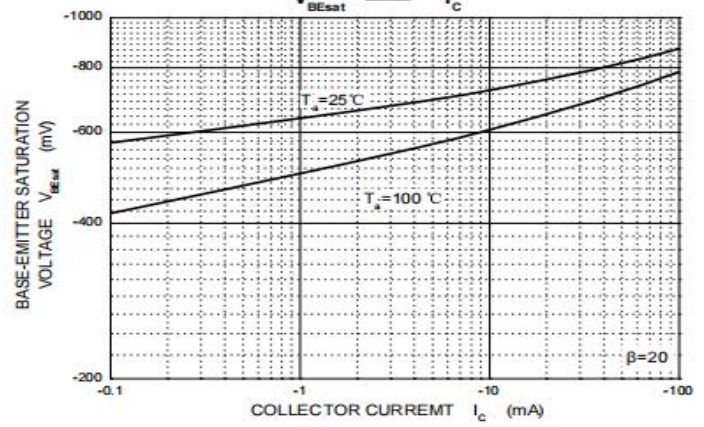
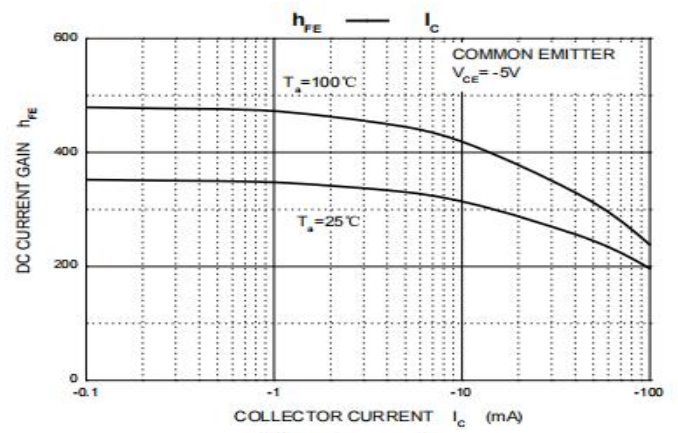
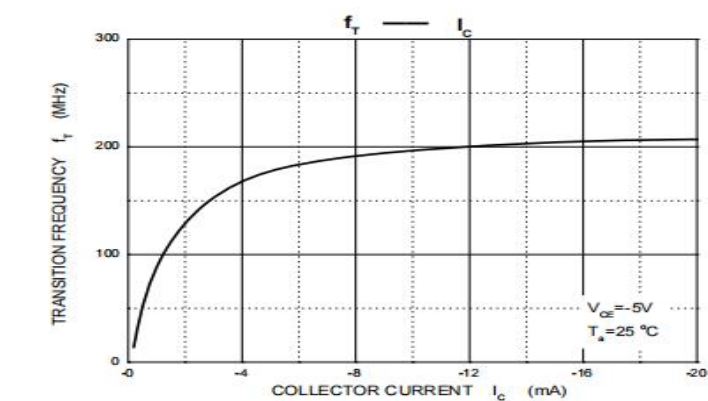
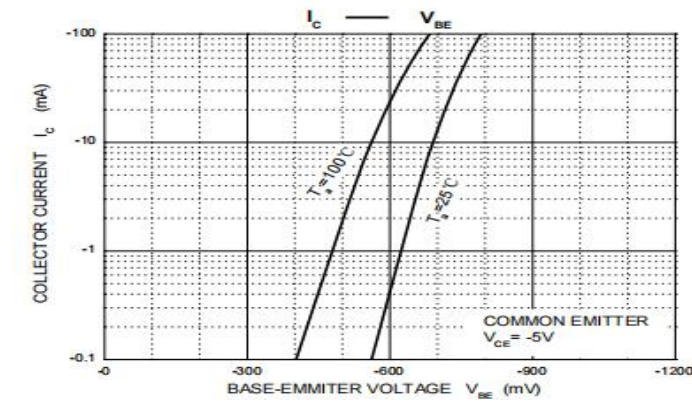
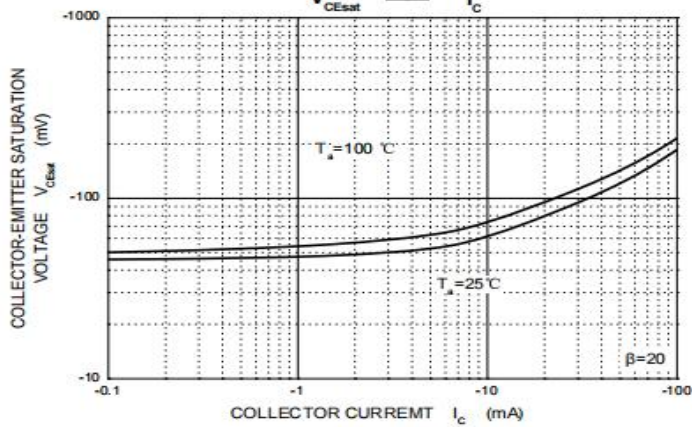
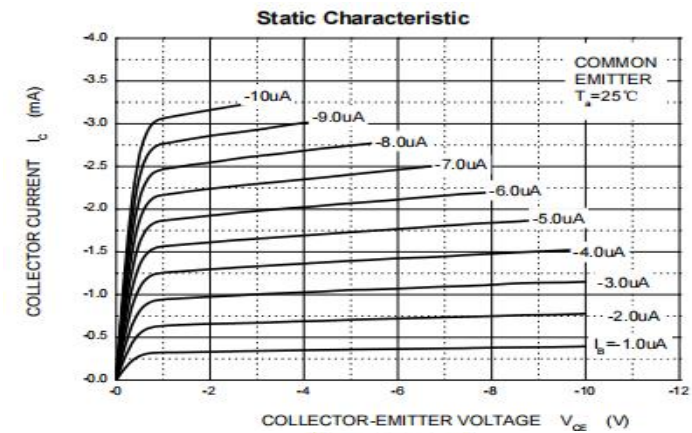
Ratings and Characteristics Curves

($T_A = 25^\circ\text{C}$ unless otherwise noted)



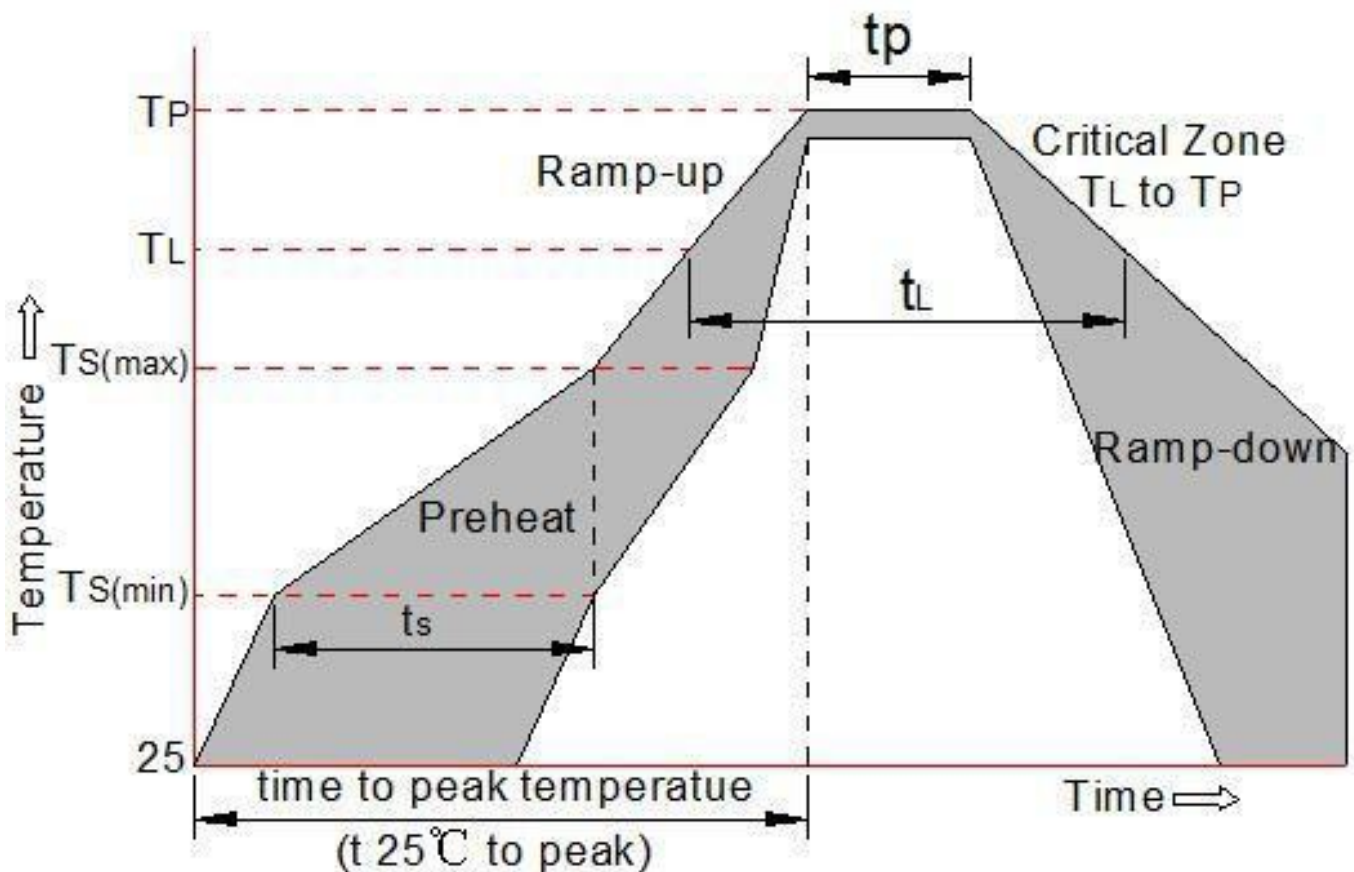
Ratings and Characteristics Curves

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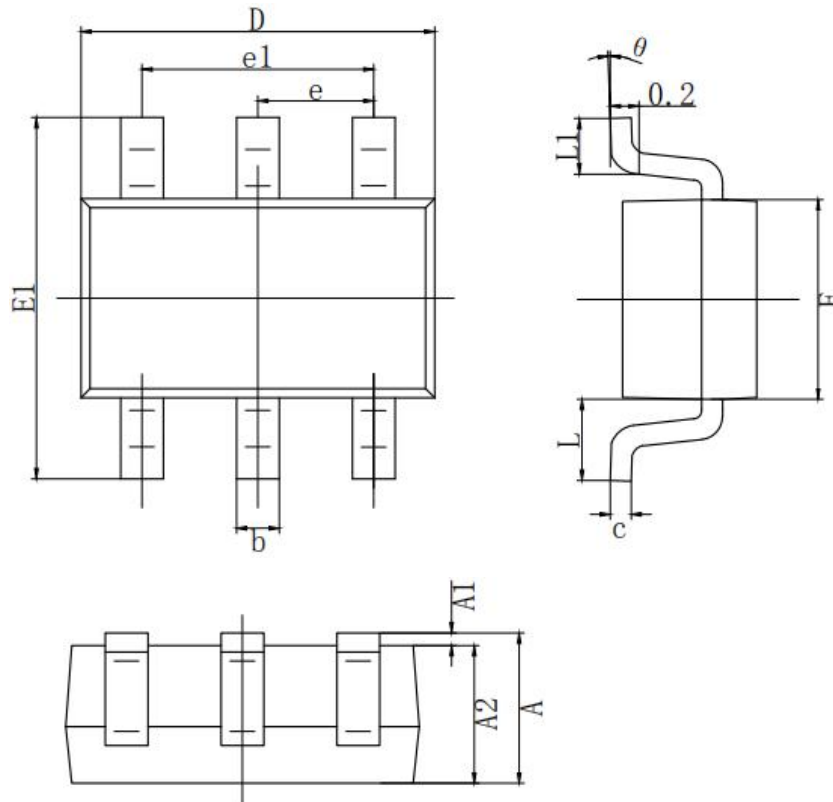
Soldering Parameters

Reflow Condition		Pb -Free assembly (see as bellow)
Pre Heat	-Temperature Min ($T_{s(min)}$)	+150 °C
	-Temperature Max($T_{s(max)}$)	+200 °C
	-Time (Min to Max) (t_s)	60 -180 secs.
Average ramp up rate (Liquid us Temp (T_L) to peak)		3 °C /sec. Max
$T_{s(max)}$ to T_L - Ramp -up Rate		3 °C /sec. Max
Reflow	-Temperature(T_L) (Liquid us)	+217 °C
	-Temperature(t_L)	60 -150 secs.
Peak Temp (T_p)		+260(+0/ -5) °C
Time within 5 °C of actual Peak Temp (t_p)		30 secs. Max
Ramp -down Rate		6 °C /sec. Max
Time 25 °C to Peak Temp (T_p)		8 min. Max
Do not exceed		+260 °C



Package Outline Dimensions

millimeters



SYMBOL	MILLIMETER	
	MIN	MAX
A	0.900	1.100
A1	0.000	0.100
A2	0.900	1.000
b	0.150	0.350
c	0.080	0.150
D	2.000	2.200
E	1.150	1.350
E1	2.150	2.450
e	0.650 TYP.	
e1	1.200	1.400
L	0.525 REF.	
L1	0.260	0.460
θ	0°	8°

Revision History

Document Version	Date of release	Description of changes
Rev.A	2017.06.13	First issue

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