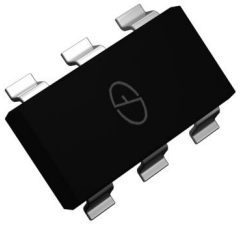
NPN+PNP Dual Transistors

Features

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

RoHS
COMPLIANT

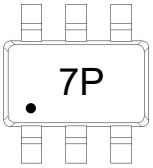


Marking: .7P

SOT-363

Applications

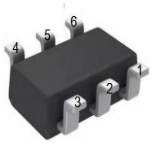
- General purpose small signal amplifier



Pin definition

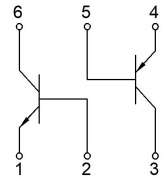
Mechanical Data

- 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



2.5：Base
1.4：Emitter
3.6：Collector

Epuivalent circuit



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

Parameter	Symbol	Value		Unit
		TR1	TR2	V
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		℃
Storage Temperature Range	T_{STG}	-55 to +150		℃

TR1 NPN Electrical Specifications (T_A=25℃ unless otherwise noted)

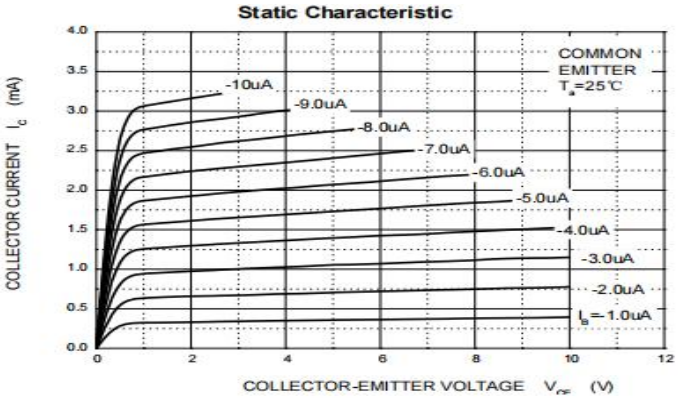
Parameter	Symbol	Test Conditions	Limit			Unit
			Min	Typ	Max	
Collector-BaseBreakdown Voltage	$V_{(BR)CBO}$	I_C = 10μA, I_E = 0	50			V
Collector-EmitterBreakdown Voltage	$V_{(BR)CEO}$	I_C = 10mA, I_B = 0	45			V
Emitter-BaseBreakdown Voltage	$V_{(BR)EBO}$	I_E = 1μA, I_C = 0	6			V
Collector Cut-off Current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

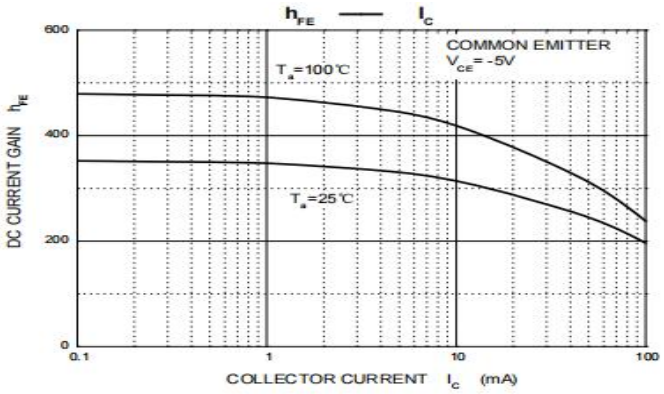
TR2 PNP Electrical Specifications (T_A=25℃ unless otherwise noted)

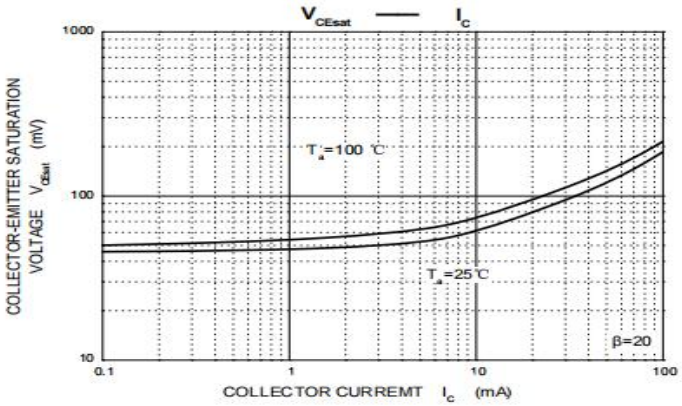
Parameter	Symbol	Test Conditions	Limit			Unit
			Min	Typ	Max	
Collector-BaseBreakdown Voltage	$V_{(BR)CBO}$	I_C = -10μA, I_E = 0	-50			V
Collector-EmitterBreakdown Voltage	$V_{(BR)CEO}$	I_C = -10mA, I_B = 0	-45			V
Emitter-BaseBreakdown Voltage	$V_{(BR)EBO}$	I_E = -1μA, I_C = 0	-5			V
Collector Cut-off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

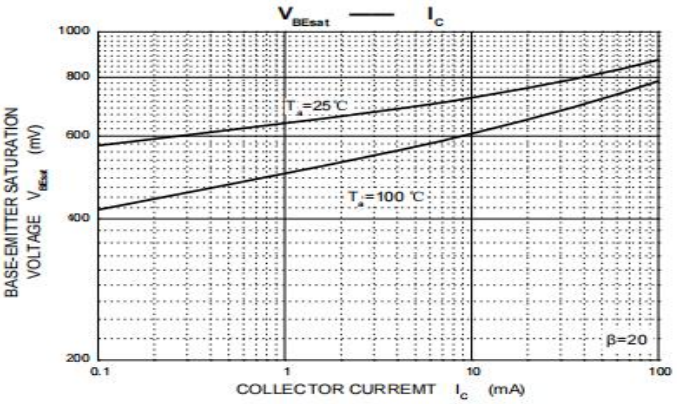
Ratings and Characteristics Curves

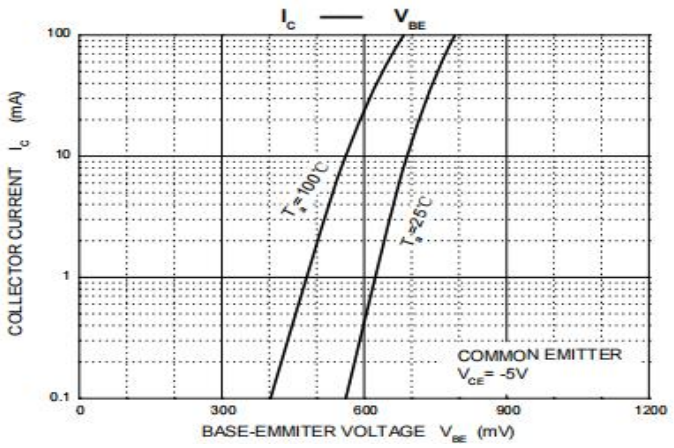
(TA = 25℃ unless otherwise noted)

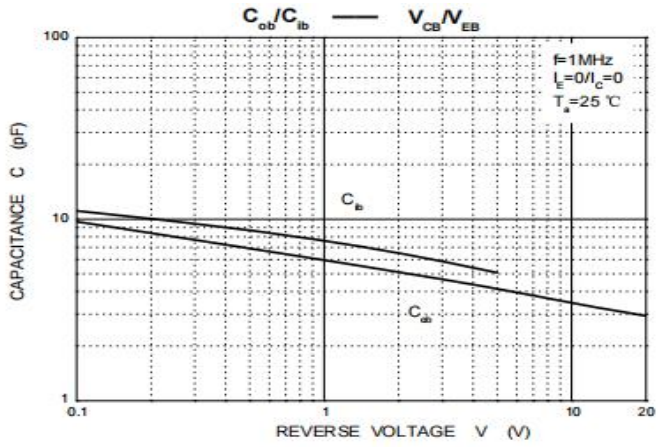


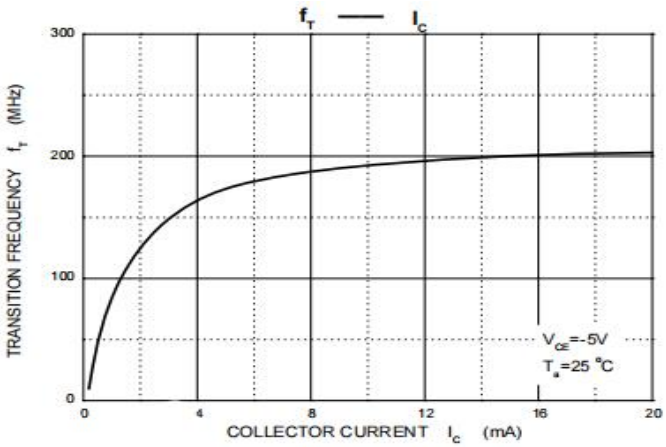


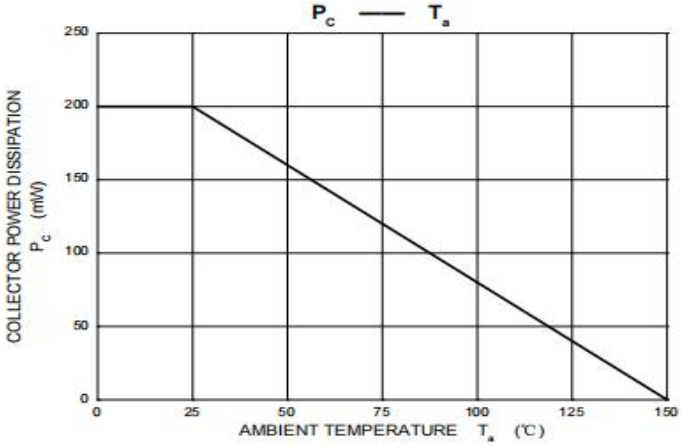






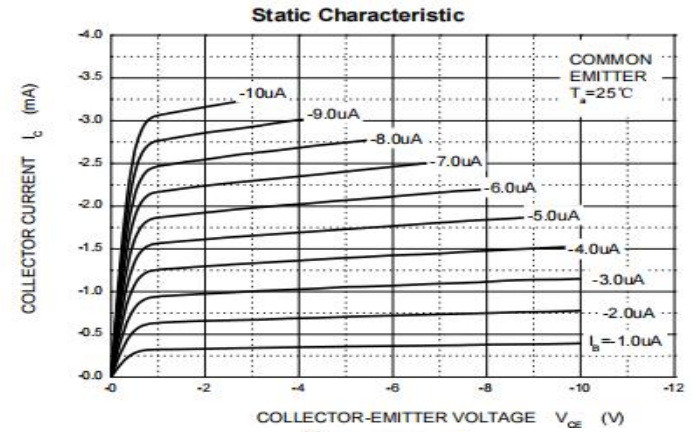


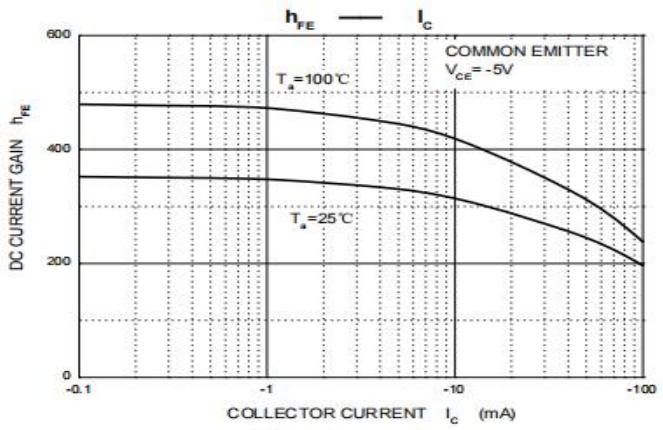


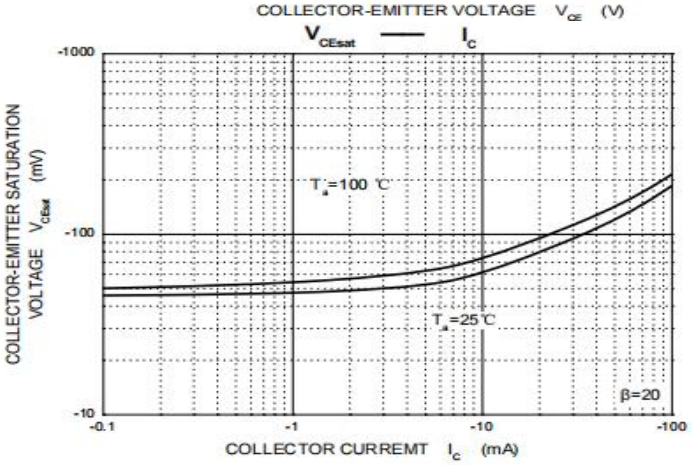


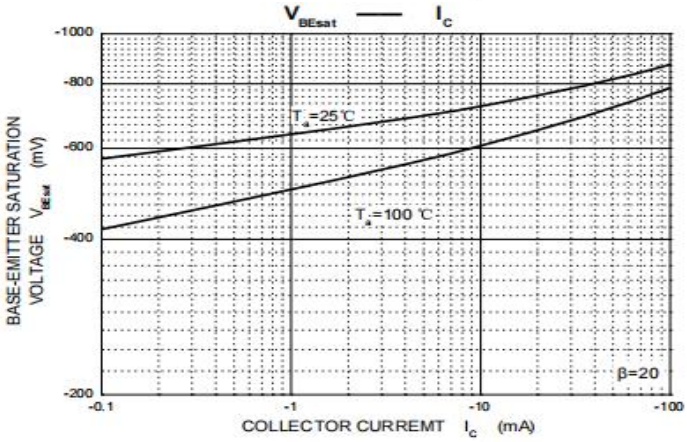
Ratings and Characteristics Curves

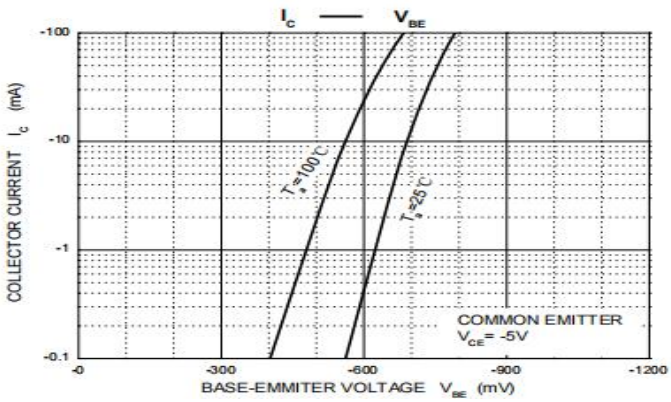
(T_A = 25℃ unless otherwise noted)

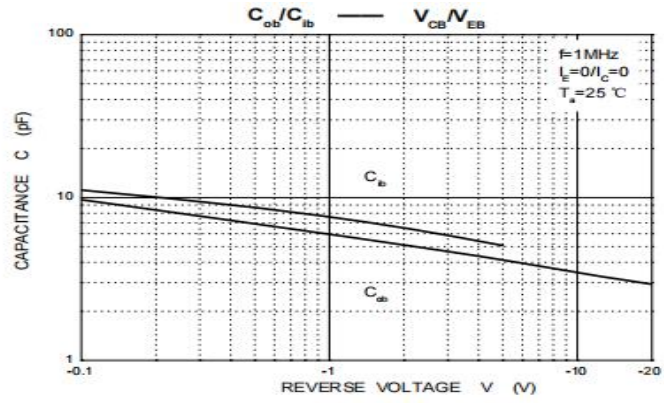


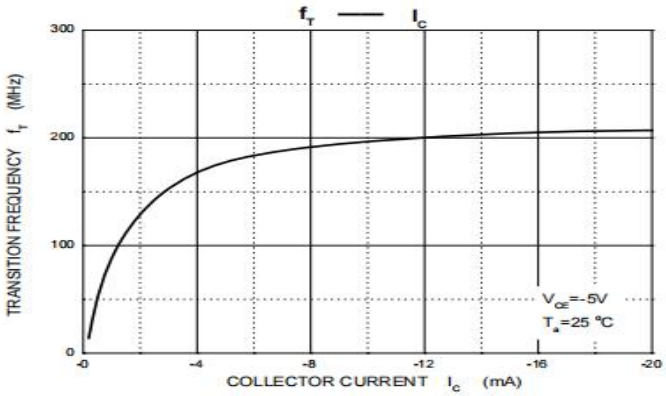


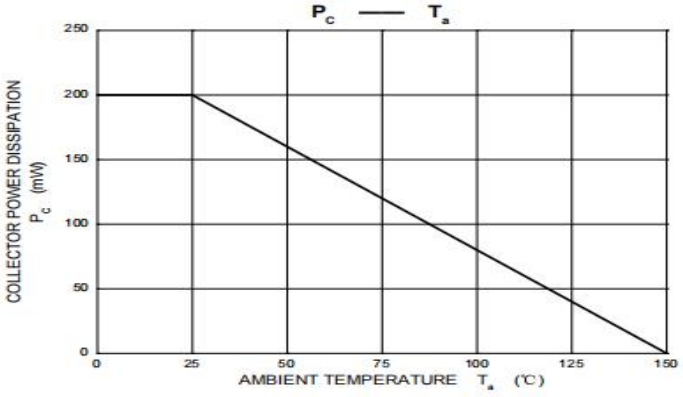






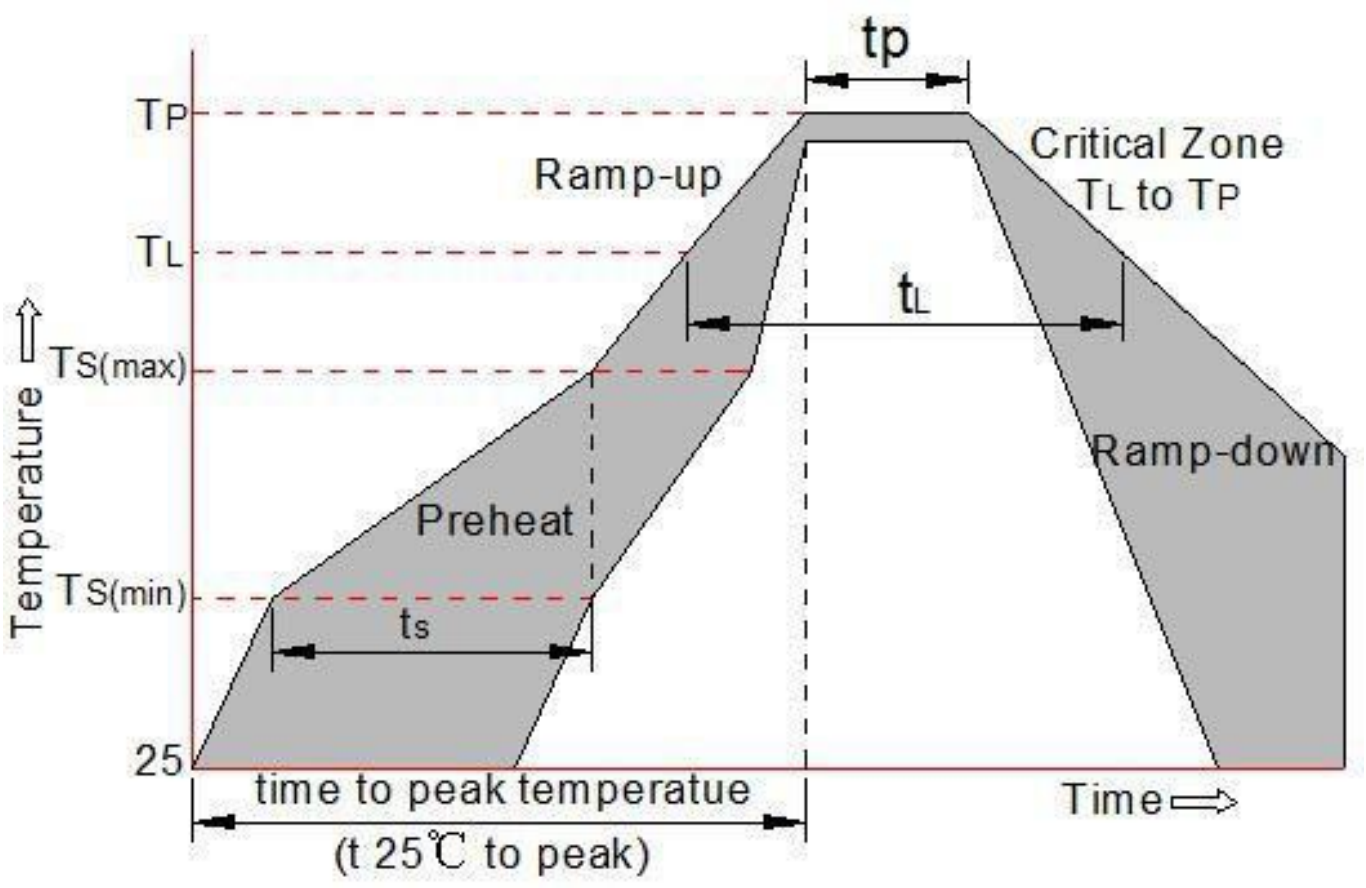






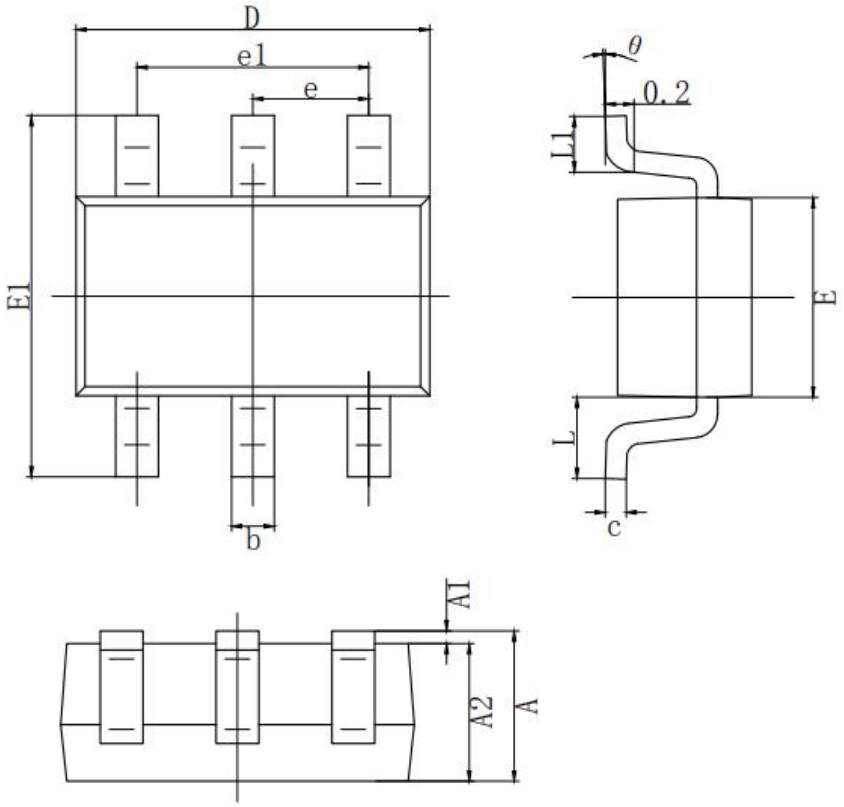
Soldering Parameters

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



Package Outline Dimensions

in inches (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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