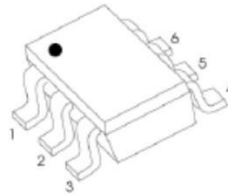


## Features

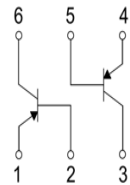
- Two transistors in one package
- Reduces number of components and board space
- No mutual interference between the transistors



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Equivalent Circuit



## MAXIMUM RATINGS AND ELECTRICAL CHARACTERISTICS

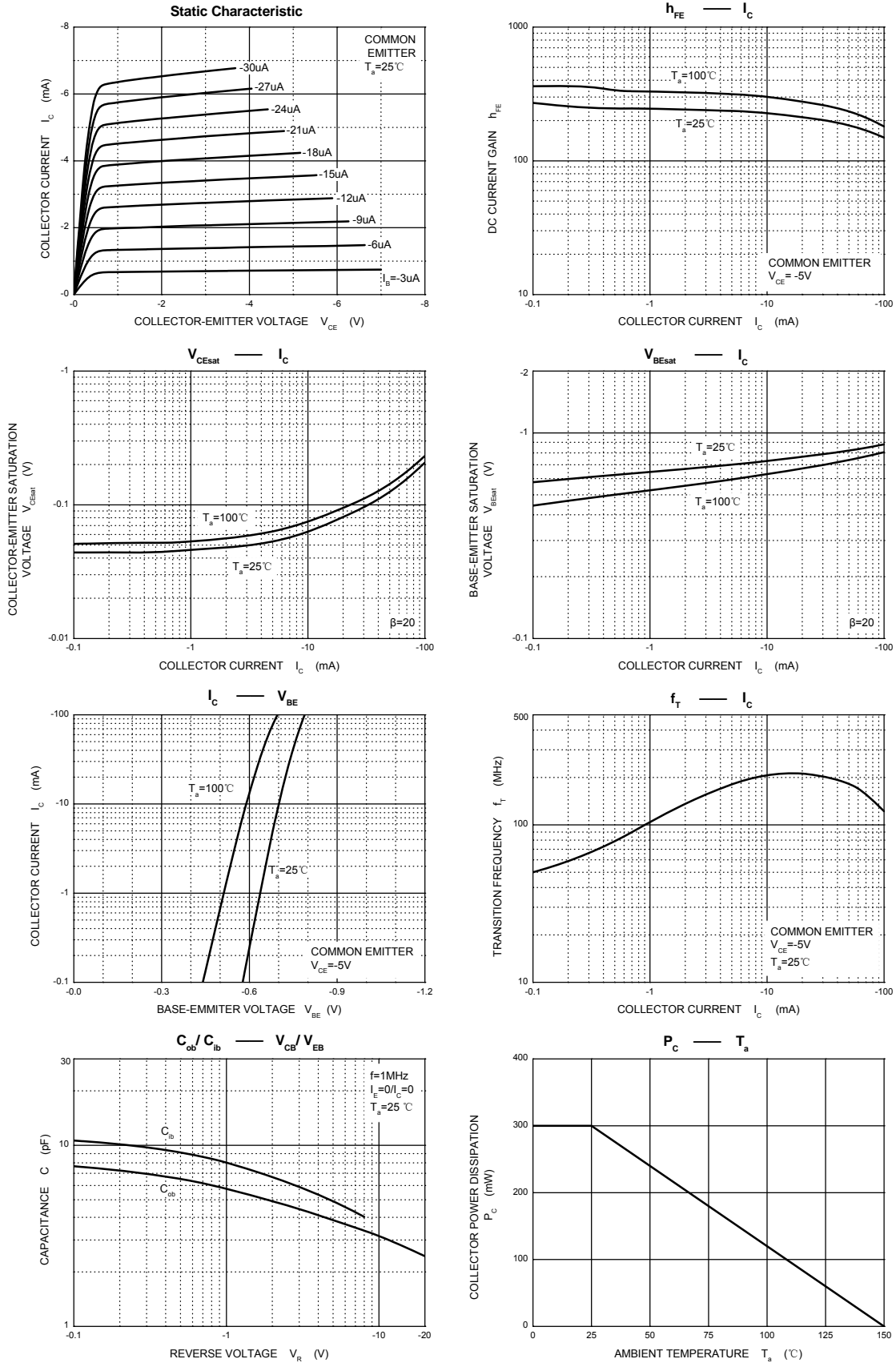
### MAXIMUM RATINGS TR1 (T<sub>a</sub>=25°C unless otherwise noted)

Symbol	Parameter	Value	Units
V <sub>CBO</sub>	Collector- Base Voltage	-50	V
V <sub>CEO</sub>	Collector-Emitter Voltage	-45	V
V <sub>EBO</sub>	Emitter-Base Voltage	-5	V
I <sub>C</sub>	Collector Current -Continuous	-0.2	A
P <sub>C</sub>	Collector Power Dissipation	0.3	W
R <sub>θJA</sub>	Thermal Resistance from Junction to Ambient	417	°C/W
T <sub>J</sub> , T <sub>stg</sub>	Operation Junction and Storage Temperature Range	-55~+150	°C

**CHARACTERISTICS of TR1 (NPN Transistor) (Ta=25°C unless otherwise specified)**

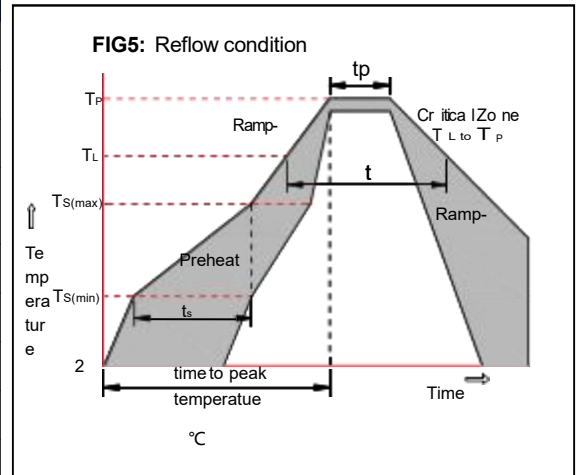
Parameter	Symbol	Test conditions	Min	Typ	Max	Unit
Collector-base breakdown voltage	$V_{(BR)CBO}$	$I_C=-10\mu A, I_E=0$	-50			V
Collector-emitter breakdown voltage	$V_{(BR)CEO}$	$I_C=-10mA, I_B=0$	-45			V
Emitter-base breakdown voltage	$V_{(BR)EBO}$	$I_E=-10\mu A, I_C=0$	-5			V
Collector cut-off current	$I_{CBO}$	$V_{CB}=-30V, I_E=0$			-15	nA
DC current gain	$h_{FE}$	$V_{CE}=-5V, I_C=-2mA$	200		450	
Collector-emitter saturation voltage	$V_{CE(sat)(1)}$	$I_C=-10mA, I_B=-0.5mA$			-0.3	V
	$V_{CE(sat)(2)}$	$I_C=-100mA, I_B=-5mA$			-0.65	V
Base-emitter voltage	$V_{BE(1)}$	$V_{CE}=-5V, I_C=-2mA$	-0.6		-0.75	V
	$V_{BE(2)}$	$V_{CE}=-5V, I_C=-10mA$			-0.82	V
Transition frequency	$f_T$	$V_{CE}=-5V, I_C=-10mA, f=100MHz$		200		MHz
Collector output capacitance	$C_{ob}$	$V_{CB}=-10V, I_E=0, f=1MHz$		3.5		pF
Noise figure	NF	$V_{CE}=-5V, I_C=-0.2mA,$ $f=1kHz, R_s=2K\Omega, BW=200Hz$		2.5		dB

RATING AND CHARACTERISTIC CURVES



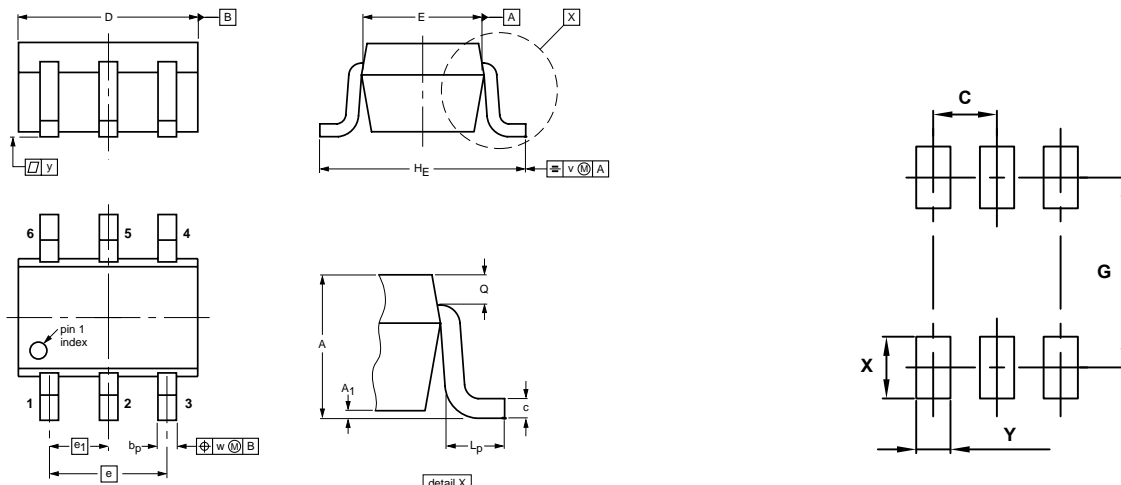
Soldering parameters

Reflow Condition		Pb-Free assembly (see as below)
Pre Heat	-Temperature Min ( $T_{s(min)}$ )	+150 °C
	-Temperature Max( $T_{s(max)}$ )	+200 °C
	-Time (Min to Max) (ts)	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 Dimensions & Suggested Pad Layout

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Dimensions	Value (in mm)
C	0.65
G	1.90
X	0.85
Y	0.40

DIMENSIONS (mm are the original dimensions)

UNIT	A	A1 max	bp	c	D	E	e	e1	HE	Lp	Q	v	w	y
mm	1.1 0.8	0.1	0.30 0.20	0.25 0.10	2.2 1.8	1.35 1.15	1.3	0.65	2.2 2.0	0.45 0.15	0.25 0.15	0.2	0.2	0.1

Tape & reel specification

Tape	Symbol	Dimension (mm)	
	P0	4.00±0.20	
	P1	4.00±0.20	
	P2	2.00±0.20	
	D0	1.55±0.20	
	D1	1.00±0.20	
	E	1.55±0.25	
	F	3.60±0.20	
	W	8.00±0.20	
	A0	3.00±0.20	
	B0	3.00±0.20	
	K0	1.30±0.20	
	T	0.20±0.20	
	<p>7" Reel</p>	D2	177.0±5.0
		D3	55Min.
		D4	R24.6±2.0
G		R82.0±2.0	
I		13.0±2.0	
W1		10.20±3.0	
Quantity: 3000PCS			