

## Plastic-Encapsulate Transistors

DUAL TRANSISTOR (NPN+PNP)

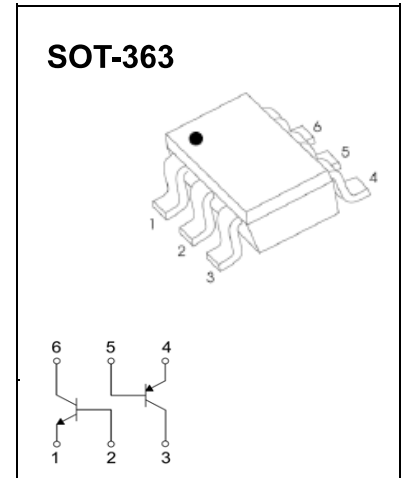
### FEATURES

- Epitaxial Die Construction
- Two isolated NPN/PNP(BC847W+BC857W) Transistors in one package

**MAKING: 7P**

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

Symbol	Parameter	Value	Units
V <sub>CB0</sub>	Collector-Base Voltage	50	V
V <sub>CE0</sub>	Collector-Emitter Voltage	45	V
V <sub>EB0</sub>	Emitter-Base Voltage	6	V
I <sub>C</sub>	Collector Current –Continuous	0.1	A
P <sub>C</sub>	Collector Power Dissipation	200	mW
T <sub>J</sub>	Junction Temperature	150	°C
T <sub>stg</sub>	Storage Temperature	-55-150	°C



### CHARACTERISTICS of TR1 (NPN Transistor) (T<sub>a</sub>=25°C unless otherwise specified)

Parameter	Symbol	Test conditions	Min	Typ	Max	Unit
Collector-base breakdown voltage	V <sub>(BR)CBO</sub>	I <sub>C</sub> =10μA, I <sub>E</sub> =0	50			V
Collector-emitter breakdown voltage	V <sub>(BR)CEO</sub>	I <sub>C</sub> =10mA, I <sub>B</sub> =0	45			V
Emitter-base breakdown voltage	V <sub>(BR)EBO</sub>	I <sub>E</sub> =1μA, I <sub>C</sub> =0	6			V
Collector cut-off current	I <sub>CBO</sub>	V <sub>CB</sub> =30V, I <sub>E</sub> =0			15	nA
Emitter cut-off current	I <sub>EBO</sub>	V <sub>EB</sub> =5V, I <sub>C</sub> =0			15	nA
DC current gain	h <sub>FE</sub>	V <sub>CE</sub> =5V, I <sub>C</sub> =2mA	200		450	
Collector-emitter saturation voltage	V <sub>CE(sat)</sub>	I <sub>C</sub> =10mA, I <sub>B</sub> =0.5mA			0.25	V
	V <sub>CE(sat)</sub>	I <sub>C</sub> =100mA, I <sub>B</sub> =5mA			0.6	V
Base-emitter saturation voltage	V <sub>BE(sat)</sub>	I <sub>C</sub> =10mA, I <sub>B</sub> =0.5mA		0.7		V
	V <sub>BE(sat)</sub>	I <sub>C</sub> =100mA, I <sub>B</sub> =5mA		0.9		V
Base-emitter voltage	V <sub>BE(on)</sub>	V <sub>CE</sub> =5V, I <sub>C</sub> =2mA	0.58		0.7	V
	V <sub>BE(on)</sub>	V <sub>CE</sub> =5V, I <sub>C</sub> =10mA			0.72	V
Collector output capacitance	C <sub>ob</sub>	V <sub>CB</sub> =10V, I <sub>E</sub> =0, f=1MHz			6.0	pF
Transition frequency	f <sub>T</sub>	V <sub>CE</sub> =5V, I <sub>C</sub> =10mA, f=100MHz	100			MHz
Noise figure	NF	V <sub>CE</sub> =5V, I <sub>C</sub> =0.2mA, f=1kHz, R <sub>g</sub> =2KΩ, Δf=200Hz			10	dB

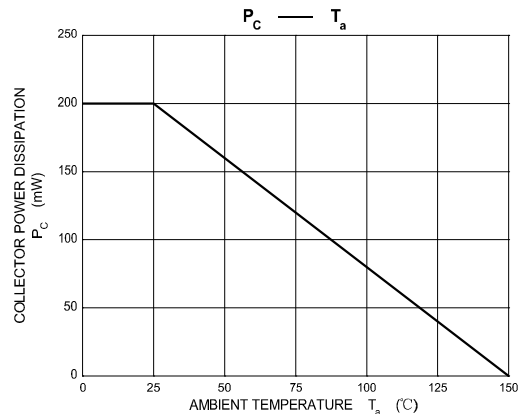
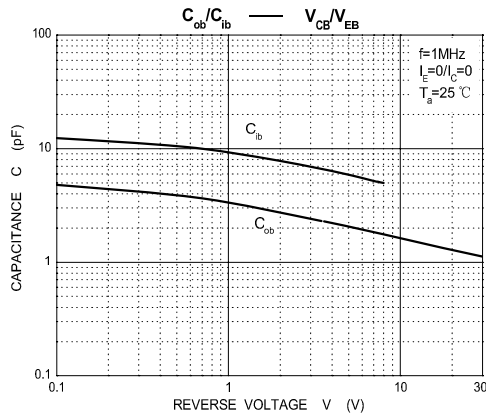
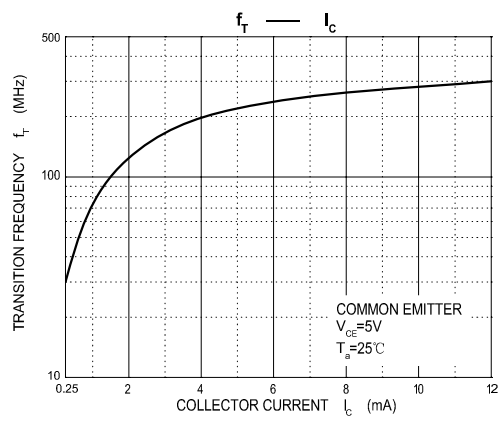
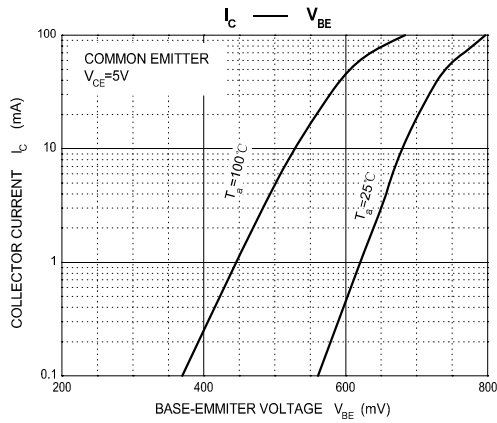
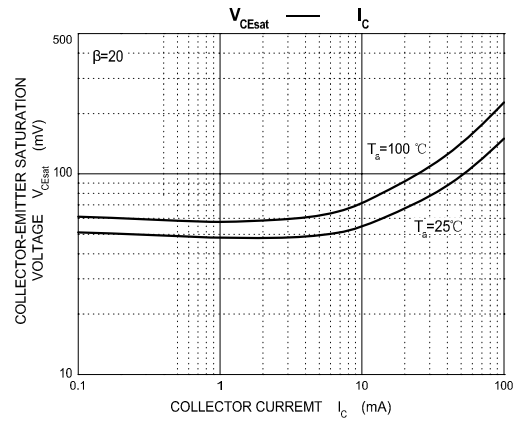
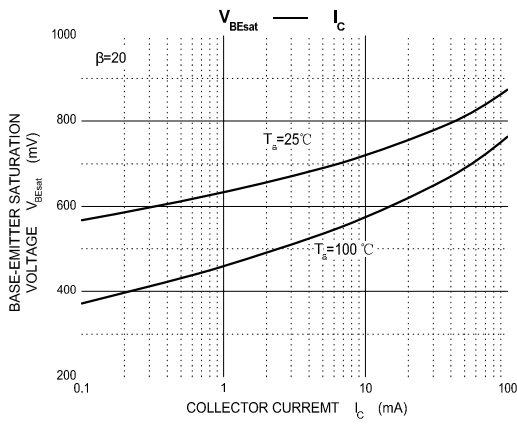
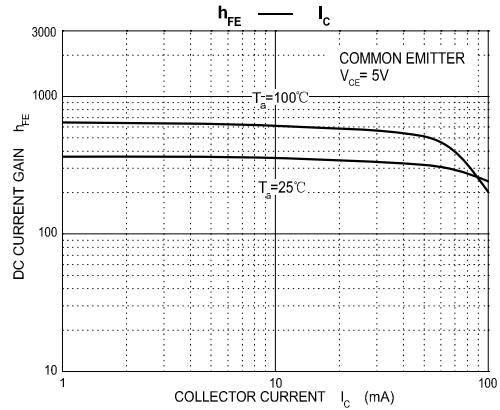
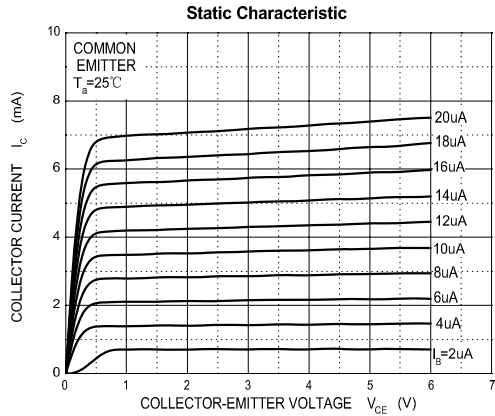
**MAXIMUM RATINGS TR2 (T<sub>a</sub>=25°C unless otherwise noted)**

Symbol	Parameter	Value	Units
V <sub>CB0</sub>	Collector-Base Voltage	-50	V
V <sub>CE0</sub>	Collector-Emitter Voltage	-45	V
V <sub>EB0</sub>	Emitter-Base Voltage	-5	V
I <sub>C</sub>	Collector Current –Continuous	-0.1	A
P <sub>C*</sub>	Collector Power Dissipation	200	mW
T <sub>J</sub>	Junction Temperature	150	°C
T <sub>stg</sub>	Storage Temperature	-55-150	°C

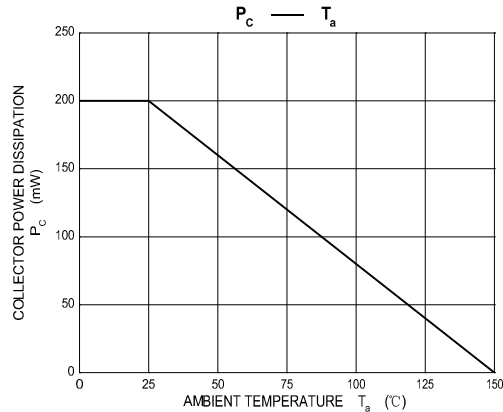
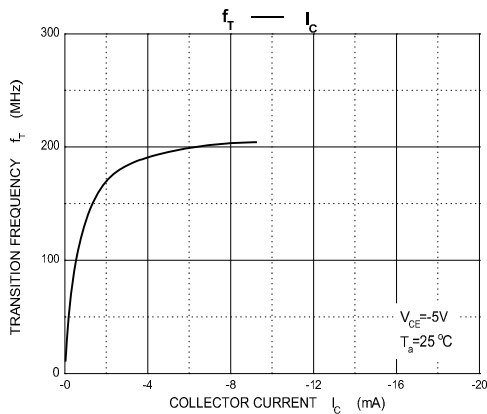
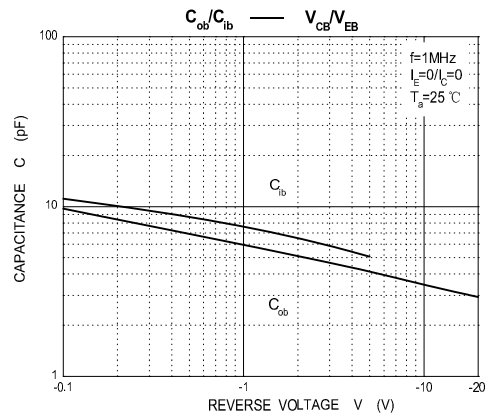
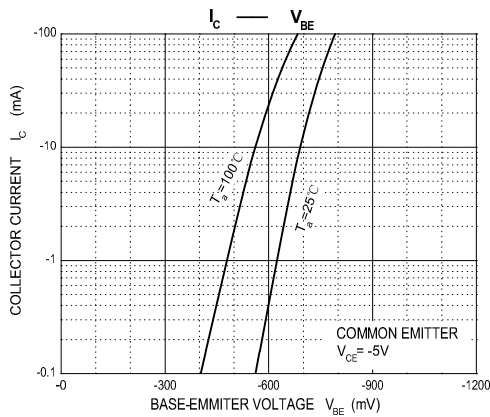
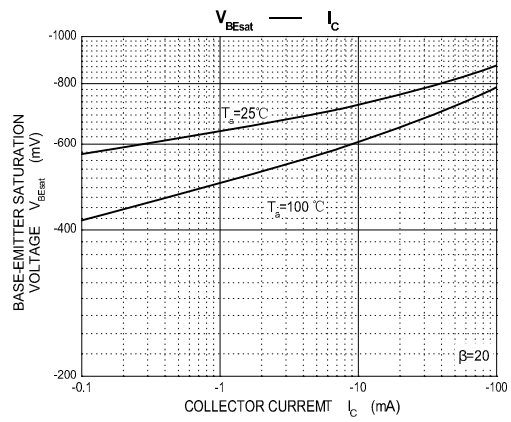
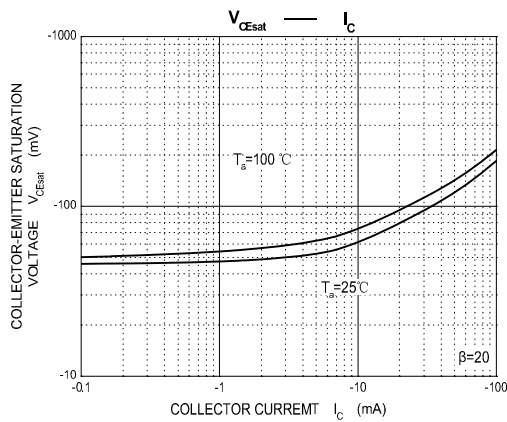
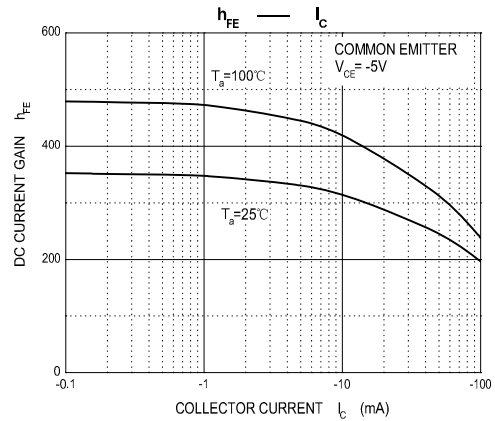
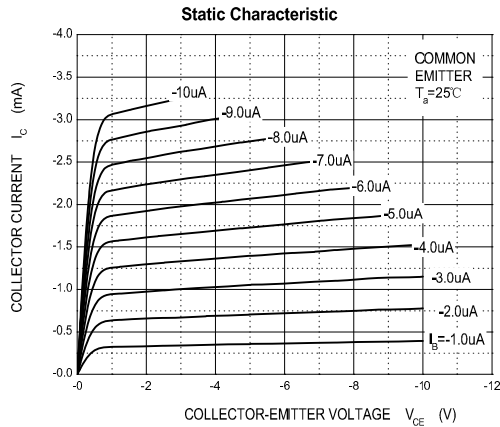
**CHARACTERISTICS of TR2 (PNP Transistor) (T<sub>a</sub>=25°C unless otherwise specified)**

Parameter	Symbol	Test conditions	MIN	TYP	MAX	UNIT
Collector-base breakdown voltage	V <sub>(BR)CBO</sub>	I <sub>C</sub> =-10μA, I <sub>E</sub> =0	-50			V
Collector-emitter breakdown voltage	V <sub>(BR)CEO</sub>	I <sub>C</sub> =-10mA, I <sub>B</sub> =0	-45			V
Emitter-base breakdown voltage	V <sub>(BR)EBO</sub>	I <sub>E</sub> =-1μA, I <sub>C</sub> =0	-5			V
Collector cut-off current	I <sub>CBO</sub>	V <sub>CB</sub> =-30V, I <sub>E</sub> =0			-15	nA
Emitter cut-off current	I <sub>EBO</sub>	V <sub>EB</sub> =-5V, I <sub>C</sub> =0			-15	nA
DC current gain	h <sub>FE1</sub>	V <sub>CE</sub> =-5V, I <sub>C</sub> =-2mA	220		475	
Collector-emitter saturation voltage	V <sub>CE(sat)</sub>	I <sub>C</sub> =-10mA, I <sub>B</sub> =-0.5mA			-0.3	V
	V <sub>CE(sat)</sub>	I <sub>C</sub> =-100mA, I <sub>B</sub> =-5mA			-0.65	V
Base-emitter saturation voltage	V <sub>BE(sat)</sub>	I <sub>C</sub> =-10mA, I <sub>B</sub> =-0.5mA		-0.7		V
	V <sub>BE(sat)</sub>	I <sub>C</sub> =-100mA, I <sub>B</sub> =-5mA			-0.95	V
Base-emitter voltage	V <sub>BE(on)</sub>	V <sub>CE</sub> =-5V, I <sub>C</sub> =-2mA	-0.6		-0.75	V
	V <sub>BE(on)</sub>	V <sub>CE</sub> =-5V, I <sub>C</sub> =-10mA			-0.82	V
Collector output capacitance	C <sub>ob</sub>	V <sub>CB</sub> =-10V, I <sub>E</sub> =0, f=1MHz			4.5	pF
Transition frequency	f <sub>T</sub>	V <sub>CE</sub> =-5V, I <sub>C</sub> =-10mA, f=100MHz	100			MHz
Noise figure	NF	V <sub>CE</sub> =-5V, I <sub>C</sub> =-0.2mA, f=1kHz, R <sub>g</sub> =2KΩ, Δf=200Hz			10	dB

**Typical Characteristics**

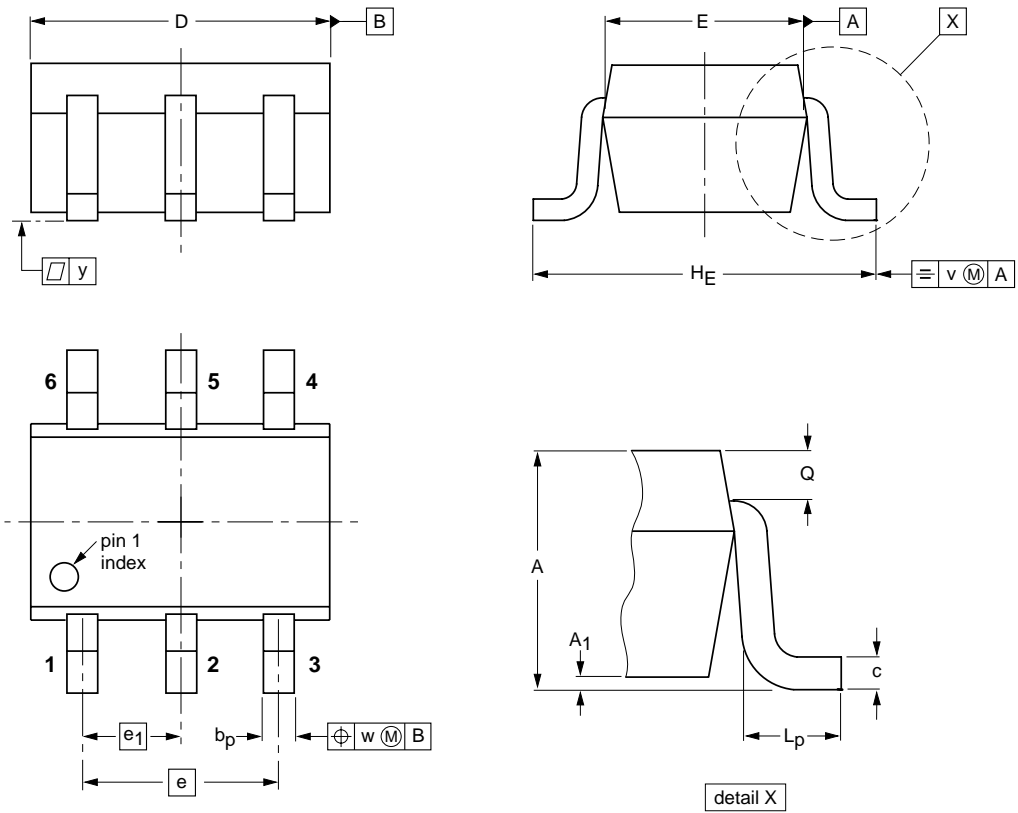


**Typical Characteristics**



Package Outline

SOT-363



DIMENSIONS (mm are the original dimensions)

UNIT	A	A <sub>1</sub> max	bp	c	D	E	e	e <sub>1</sub>	H <sub>E</sub>	L <sub>p</sub>	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

Summary of Packing Options

Package	Package Description	Packing Quantity	Industry Standard
SOT-363	Tape/Reel, 7" reel	3000	EIA-481-1