

Features

- Ultra-Small Surface Mount Package
- Halogen Free. "Green" Device (Note 1)
- Moisture Sensitivity Level 1
- Epoxy Meets UL 94 V-0 Flammability Rating
- Lead Free Finish/RoHS Compliant ("P" Suffix Designates RoHS Compliant. See Ordering Information)

Maximum Ratings @ 25°C Unless Otherwise Specified

- Operating Junction Temperature Range: -55°C to +150°C
- Storage Temperature Range: -55°C to +150°C
- Thermal Resistance: 625°C/W Junction to Ambient

NPN Pin1,2,6

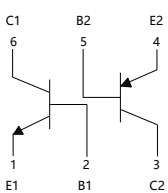
Parameter	Symbol	Rating	Unit
Collector-Base Voltage	V_{CBO}	50	V
Collector-Emitter Voltage	V_{CEO}	45	V
Emitter-Base Voltage	V_{EBO}	6	V
Collector Current	I_C	100	mA
Peak Collector Current	I_{CM}	200	mA
Power Dissipation	P_C	200	mW

PNP Pin3,4,5

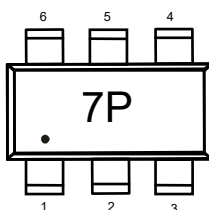
Parameter	Symbol	Rating	Unit
Collector-Base Voltage	V_{CBO}	-50	V
Collector-Emitter Voltage	V_{CEO}	-45	V
Emitter-Base Voltage	V_{EBO}	-5	V
Collector Current	I_C	-100	mA
Peak Collector Current	I_{CM}	-200	mA
Power Dissipation	P_C	200	mW

Note: 1. Halogen free "Green" products are defined as those which contain <900ppm bromine, <900ppm chlorine (<1500ppm total Br + Cl) and <1000ppm antimony compounds.

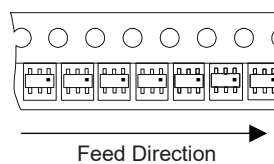
Internal Structure



Device Marking

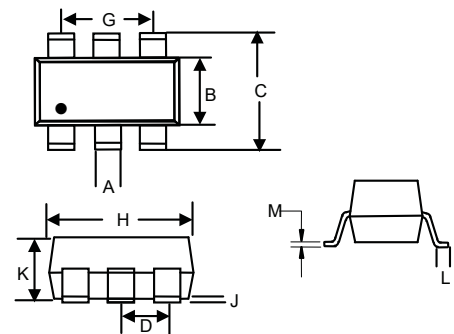


Special packing as below



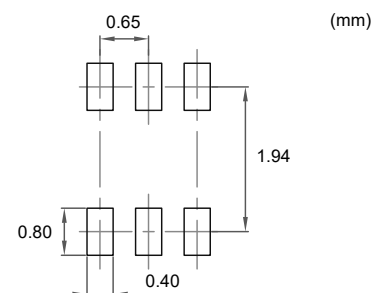
**NPN/PNP
Small Signal
Transistors**

SOT-363



DIM	DIMENSIONS				NOTE
	INCHES		MM		
	MIN	MAX	MIN	MAX	
A	0.006	0.014	0.15	0.35	
B	0.045	0.053	1.15	1.35	
C	0.079	0.096	2.00	2.45	
D	0.026		0.65		TYP.
G	0.047	0.055	1.20	1.40	
H	0.071	0.087	1.80	2.20	
J	-----	0.004	-----	0.10	
K	0.031	0.043	0.80	1.10	
L	0.010	0.018	0.26	0.46	
M	0.003	0.006	0.08	0.15	

Suggested Solder Pad Layout



NPN Electrical Characteristics @ 25°C Unless Otherwise Specified

Parameter	Symbol	Min	Typ	Max	Units	Conditions
Collector-Base Breakdown Voltage	$V_{(BR)CBO}$	50			V	$I_C=10\mu A, I_E=0$
Collector-Emitter Breakdown Voltage	$V_{(BR)CEO}$	45			V	$I_C=10mA, I_B=0$
Emitter-Base Breakdown Voltage	$V_{(BR)EBO}$	6			V	$I_E=1\mu A, I_C=0$
Collector-Base Cutoff Current	I_{CBO}			15	nA	$V_{CB}=30V, I_E=0$
Emitter-Base Cutoff Current	I_{EBO}			100	nA	$V_{EB}=5V, I_C=0$
DC Current Gain	h_{FE}	200		450		$V_{CE}=5V, I_C=2mA$
Collector-Emitter Saturation Voltage	$V_{CE(sat)}$			0.25	V	$I_C=10mA, I_B=0.5mA$
				0.6	V	$I_C=100mA, I_B=5mA$
Base-Emitter Saturation Voltage	$V_{BE(sat)}$		0.7		V	$I_C=10mA, I_B=0.5mA$
			0.9		V	$I_C=100mA, I_B=5mA$
Base-Emitter Voltage	V_{BE}	0.58		0.7	V	$V_{CE}=5V, I_C=2mA$
				0.72	V	$V_{CE}=5V, I_C=10mA$
Collector Output Capacitance	C_{ob}			6	pF	$V_{CB}=10V, f=1MHz$
Transition Frequency	f_T	100			MHz	$V_{CE}=5V, I_C=10mA, f=100MHz$
Noise Figure	NF			10	dB	$V_{CE}=5V, I_C=0.2mA, f=1KHz$ $R_g=2K\Omega, \Delta f=200Hz$

PNP Electrical Characteristics @ 25°C Unless Otherwise Specified

Parameter	Symbol	Min	Typ	Max	Units	Conditions
Collector-Base Breakdown Voltage	$V_{(BR)CBO}$	-50			V	$I_C = -10\mu A, I_E = 0$
Collector-Emitter Breakdown Voltage	$V_{(BR)CEO}$	-45			V	$I_C = -10mA, I_B = 0$
Emitter-Base Breakdown Voltage	$V_{(BR)EBO}$	-5			V	$I_E = -1\mu A, I_C = 0$
Collector-Base Cutoff Current	I_{CBO}			-15	nA	$V_{CB} = -30V, I_E = 0$
Emitter-Base Cutoff Current	I_{EBO}			-100	nA	$V_{EB} = -5V, I_C = 0$
DC Current Gain	h_{FE}	220		475		$V_{CE} = -5V, I_C = -2mA$
Collector-Emitter Saturation Voltage	$V_{CE(sat)}$			-0.3	V	$I_C = -10mA, I_B = -0.5mA$
				-0.65	V	$I_C = -100mA, I_B = -5mA$
Base-Emitter Saturation Voltage	$V_{BE(sat)}$		-0.7		V	$I_C = -10mA, I_B = -0.5mA$
				-0.95	V	$I_C = -100mA, I_B = -5mA$
Base-Emitter Voltage	V_{BE}	-0.6		-0.75	V	$V_{CE} = -5V, I_C = -2mA$
				-0.82	V	$V_{CE} = -5V, I_C = -10mA$
Collector Output Capacitance	C_{ob}			4.5	pF	$V_{CB} = -10V, I_E = 0, f = 1MHz$
Transition Frequency	f_T	100			MHz	$V_{CE} = -5V, I_C = -10mA, f = 100MHz$
Noise Figure	NF			10	dB	$V_{CE} = -5V, I_C = -0.2mA, f = 1KHz$ $R_g = 2K\Omega, \Delta f = 200Hz$

Curve Characteristics (NPN Transistor)

Fig. 1 - Static Characteristics

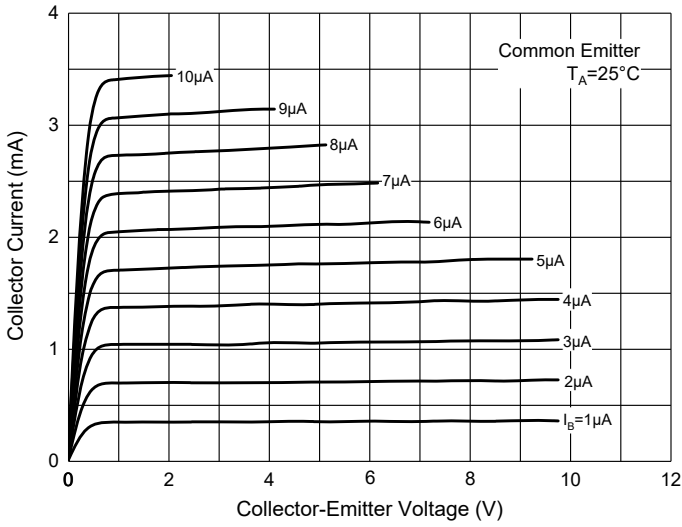


Fig. 2 - DC Current Gain Characteristics

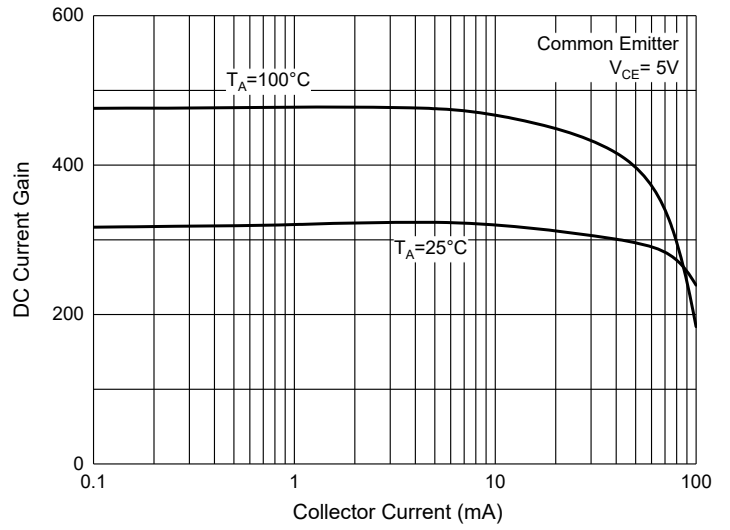


Fig. 3 - Collector-Emitter Saturation Voltage Characteristics

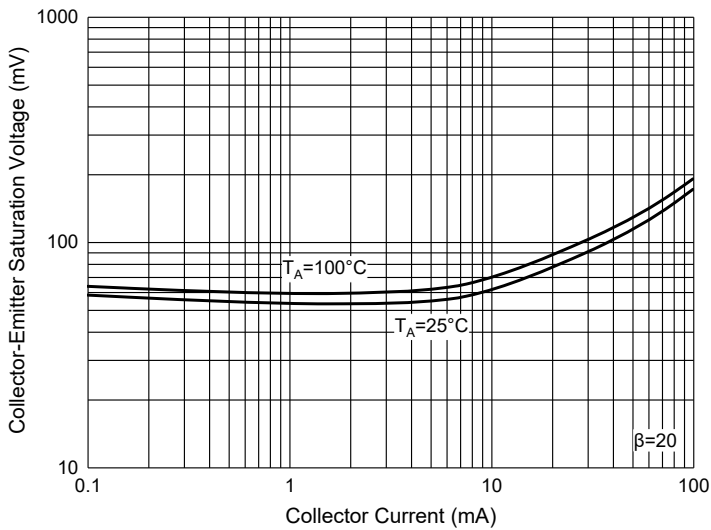


Fig. 4 - Base-Emitter Saturation Voltage Characteristics

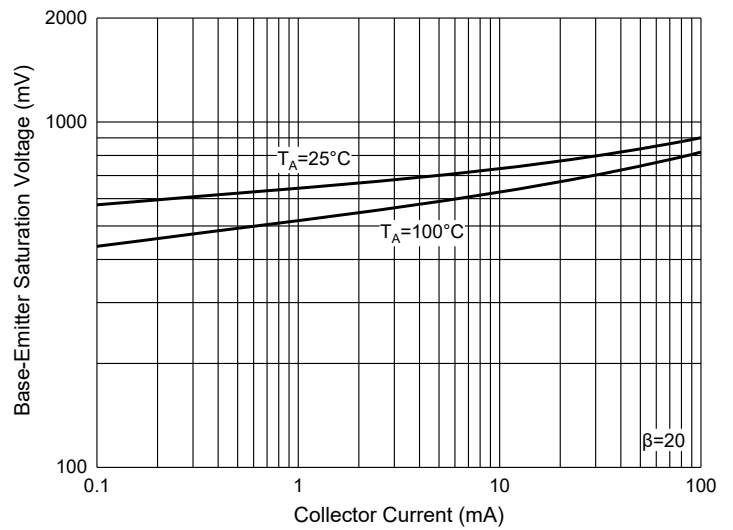


Fig. 5 - Base-Emitter Voltage Characteristics

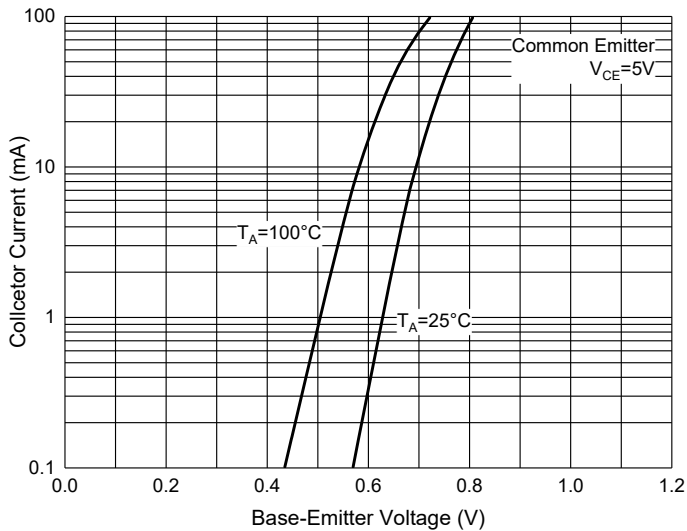
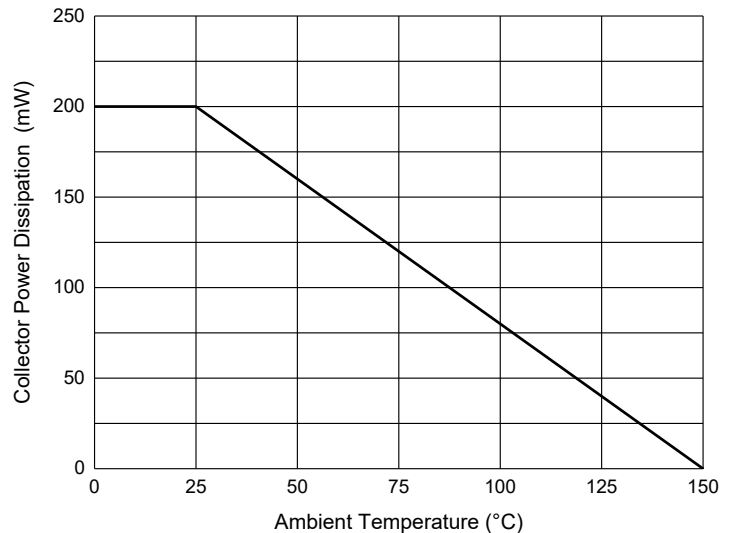


Fig. 6 - Collector Power Derating Curve



Curve Characteristics (PNP Transistor)

Fig. 7 - Static Characteristics

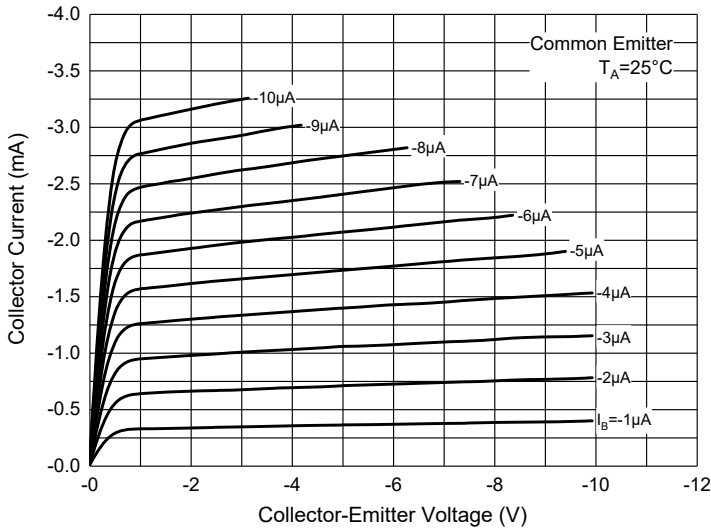


Fig. 8 - DC Current Gain Characteristics

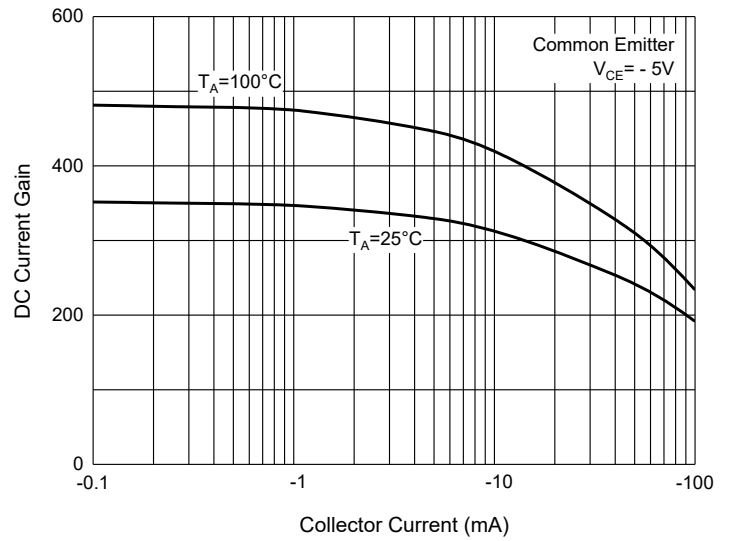


Fig. 9 - Collector-Emitter Saturation Voltage Characteristics

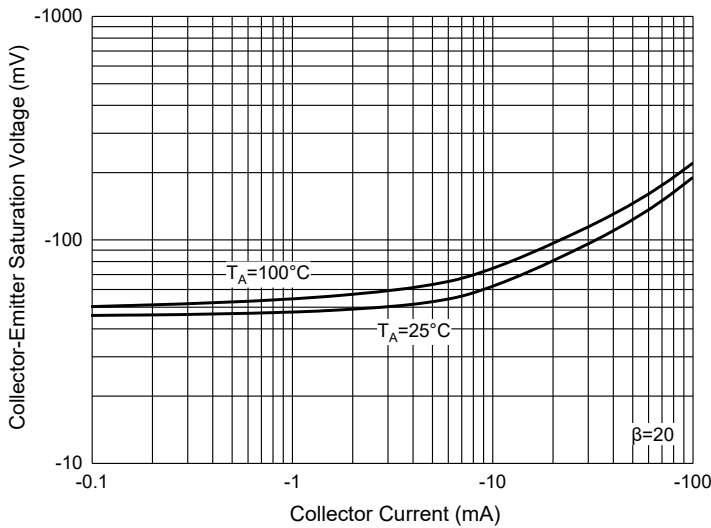


Fig. 10 - Base-Emitter Saturation Voltage Characteristics

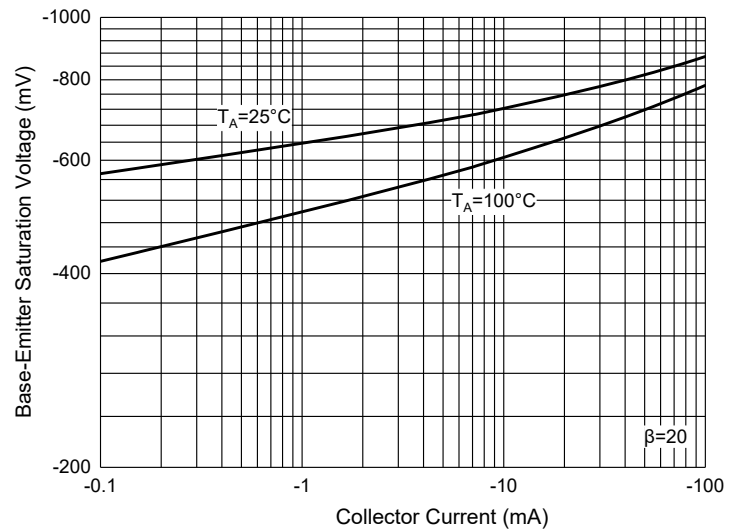


Fig. 11 - Base-Emitter Voltage Characteristics

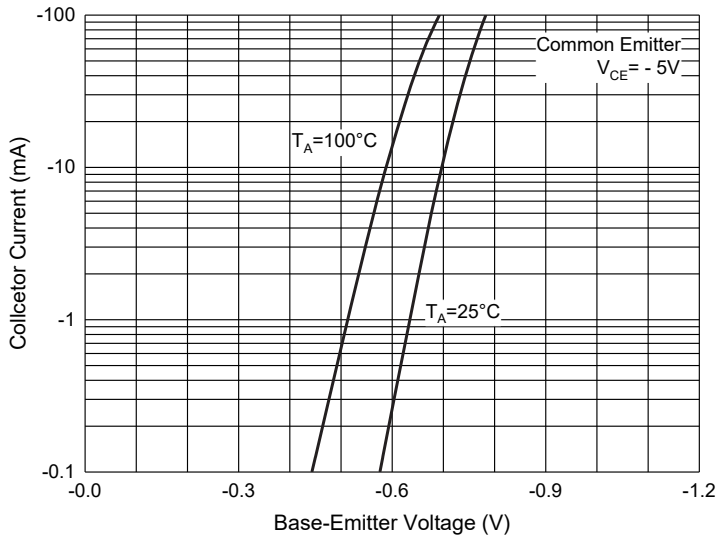
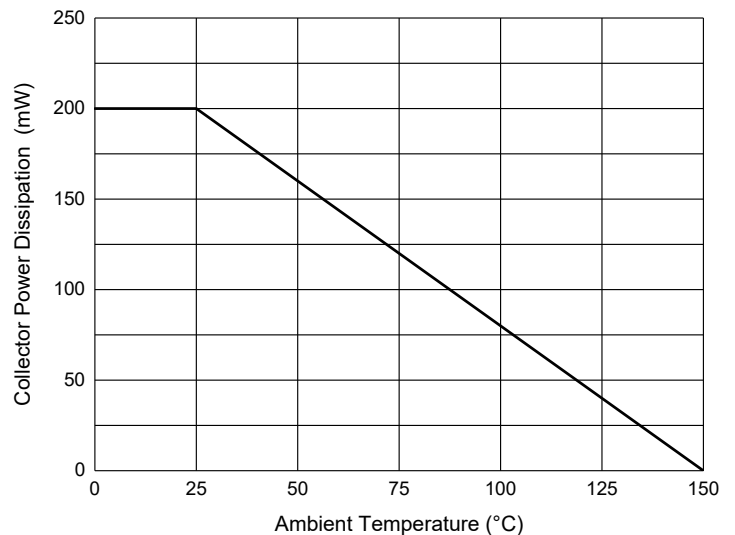


Fig. 12- Collector Power Derating Curve



Ordering Information

Device	Packing
BC847PN-TPQ2	Tape&Reel: 3Kpcs/Reel

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