

**BC856ADW / BC856BDW / BC857BDW
BC857CDW / BC858BDW / BC858CDW****List**

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BC856ADW / BC856BDW / BC857BDW BC857CDW / BC858BDW / BC858CDW

PNP Dual General Purpose Transistor

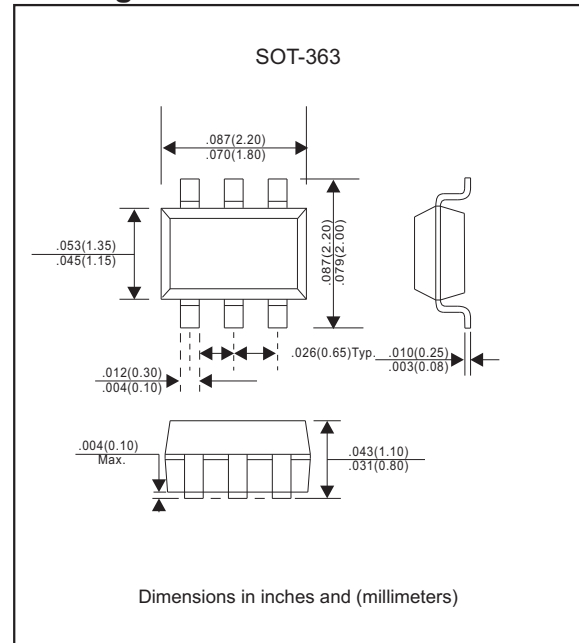
Features

- We declare that the material of product compliance with RoHS requirements.
- Suffix "-H" indicates Halogen-free part, ex. BC856ADW-H.

Mechanical data

- Epoxy: UL94-V0 rated flame retardant
- Case : Molded plastic, SOT-363
- Terminals : Solder plated, solderable per MIL-STD-750, Method 2026
- Mounting Position : Any
- Weight : Approximated 0.006 gram

Package outline



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

Rating		Symbol	Value	UNIT
Collector-Base voltage	BC856 BC857 BC858	V_{CBO}	-80 -50 -30	V
Collector-Emitter voltage	BC856 BC857 BC858	V_{CEO}	-65 -45 -30	V
Emitter-Base voltage	BC856 BC857 BC858	V_{EBO}	-5.0 -5.0 -5.0	V
Collector current-continuous		I_C	-100	mAdc

Thermal characteristics

PARAMETER		Symbol	MIN.	TYP.	MAX.	UNIT
Total device dissipation	Total Device Dissipation	P_D			380	mW
	Per Device FR-5 board(1) $T_A = 25^\circ\text{C}$				250	mW
	Derate above 25°C				3.0	mW/ $^\circ\text{C}$
Thermal resistance	Junction to ambient(1)	$R_{\theta JA}$			328	$^\circ\text{C}/\text{W}$
Operating junction temperature range		T_J	-55		+150	$^\circ\text{C}$
Storage temperature range		T_{STG}	-55		+150	$^\circ\text{C}$

1. FR-5 = 1.0 X 0.75 X 0.062 in.

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

Off characteristics

PARAMETER	CONDITIONS	Symbol	MIN.	TYP.	MAX.	UNIT
Collector-Base breakdown voltage	$I_C = -10\mu\text{A}$ BC856 SERIES BC857 SERIES BC858 SERIES	$V_{(BR)CBO}$	-80 -50 -30			V
Collector-Emitter breakdown voltage	$I_C = -10\text{mA}$ BC856 SERIES BC857 SERIES BC858 SERIES	$V_{(BR)CEO}$	-65 -45 -30			V
Emitter-Base breakdown voltage	$I_E = -1.0\mu\text{A}$ BC856 SERIES BC857 SERIES BC858 SERIES	$V_{(BR)EBO}$	-5.0 -5.0 -5.0			V
Collector-Emitter breakdown voltage	$I_C = -10\mu\text{A}$, $V_{EB} = 0$ BC856 SERIES BC857 SERIES BC858 SERIES	$V_{(BR)CES}$	-80 -50 -30			V
Collector cutoff current	$V_{CB} = -30\text{V}$ $V_{CB} = -30\text{V}$, $T_A = 150^\circ\text{C}$	I_{CBO}			-15 -4.0	nA uA

On characteristics

PARAMETER	CONDITIONS		Symbol	MIN.	TYP.	MAX.	UNIT
DC current gain	$I_c = -10\mu A, V_{CE} = -5.0V$	BC856A	h_{fe}		90		-
		BC856B, BC857B, BC858B			150		
		BC857C, BC858C			270		
	$I_c = -2.0mA, V_{CE} = -5.0V$	BC856A		125	180	250	
		BC856B, BC857B, BC858B		220	290	475	
		BC857C, BC858C		420	520	800	
Collector-Emitter saturation voltage	$I_c = -10mA, I_B = -0.5mA$	$V_{CE(sat)}$			-0.3	V	
	$I_c = -100mA, I_B = -5.0mA$				-0.65		
Base-Emitter saturation voltage	$I_c = -10mA, I_B = -0.5mA$	$V_{BE(sat)}$		-0.7		V	
	$I_c = -100mA, I_B = -5.0mA$			-0.9			
Base-Emitter voltage	$I_c = -2.0mA, V_{CE} = -5.0V$	$V_{BE(on)}$	-0.6		-0.75	V	
	$I_c = -10mA, V_{CE} = -5.0V$				-0.82		

Small-signal characteristics

PARAMETER	CONDITIONS	Symbol	MIN.	TYP.	MAX.	UNIT
Current-gain-bandwidth product	$I_C = -10\text{mA}$, $V_{CE} = -5.0\text{Vdc}$, $f = 100\text{MHz}$	f_T	100			MHz
Output capacitance	$V_{CB} = -10\text{V}$, $f = 1.0\text{MHz}$	C_{obo}			4.5	pF
Noise figure	($I_C = -0.2\text{mA}$, $V_{CE} = -5.0\text{Vdc}$, $R_s = 2.0\text{k}\Omega$, $f = 1.0\text{kHz}$, $BW = 200\text{Hz}$)	NF			10	dB

Rating and characteristic curves

BC856 Series

Fig.1- DC CURRENT GAIN

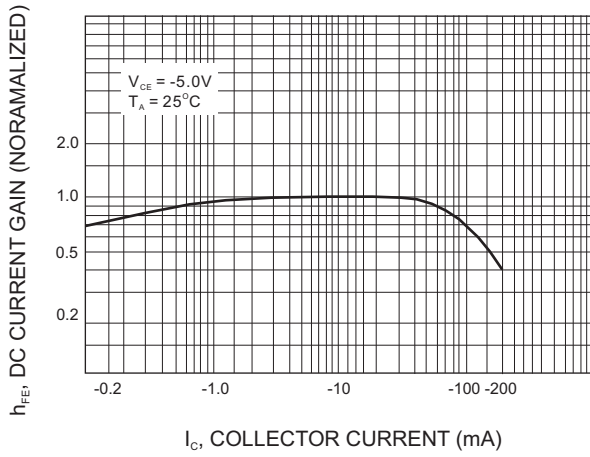


Fig. 2-"ON" VOLTAGE

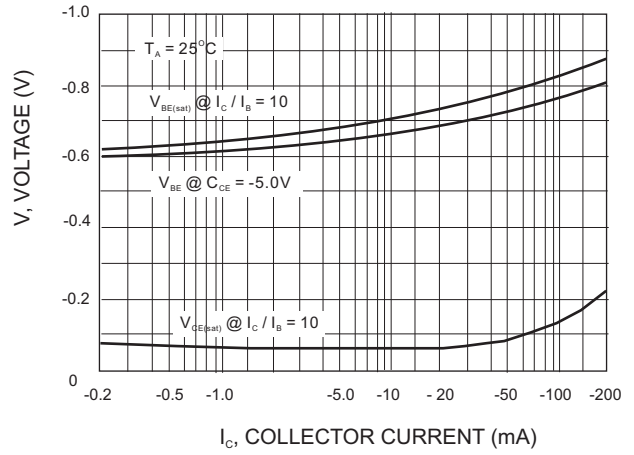


FIG.3- COLLECTOR SATURATION REGION

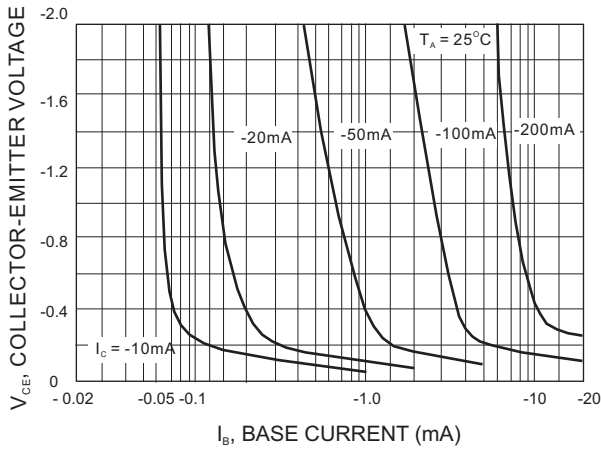


Fig. 4-BASE-EMITTER TEMPERATURE COEFFICIENT

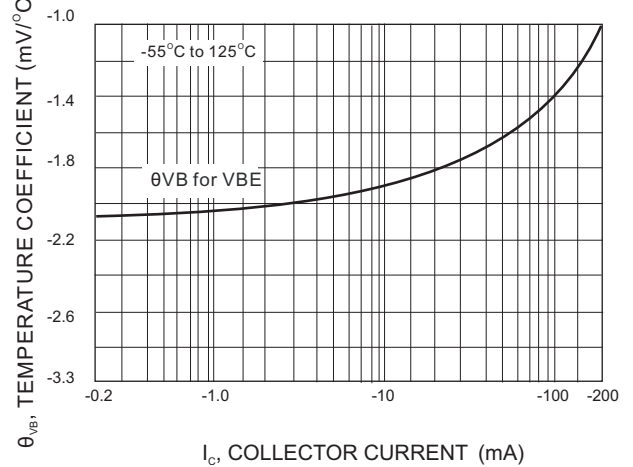


Fig. 5.-CAPACITANCE

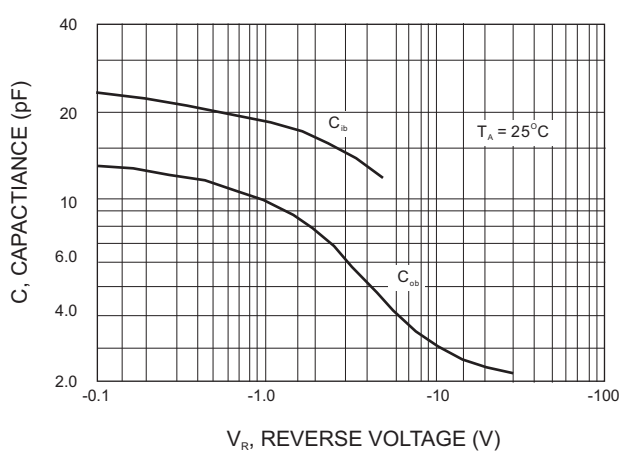
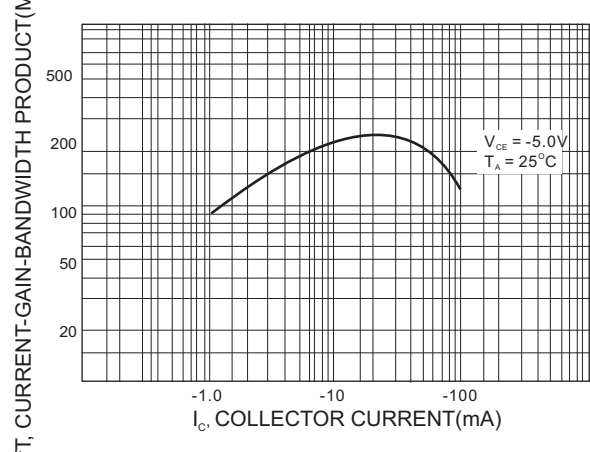


Fig. 6- CURRENT-GAIN-BANDEIDTH PRODUCT



Rating and characteristic curves

BC857/BC858 Series

Fig.7- DC CURRENT GAIN

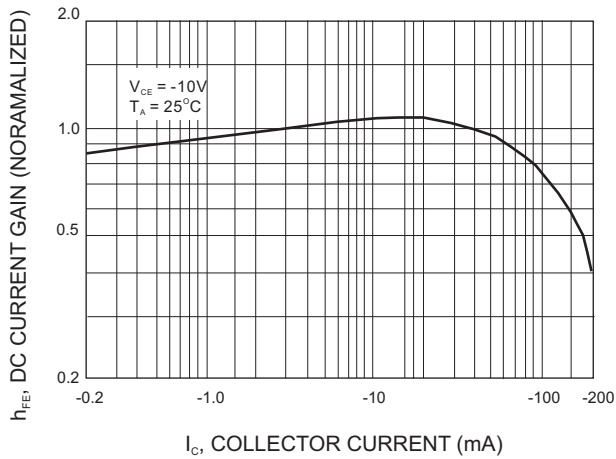


Fig. 8-"SATURATION" AND "ON" VOLTAGE

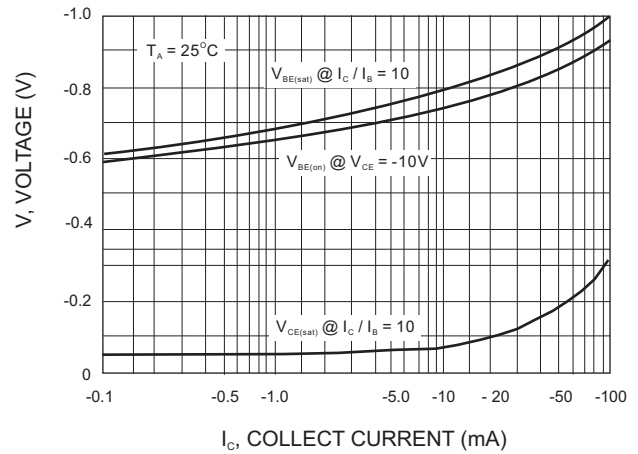


FIG.9- COLLECTOR SATURATION REGION

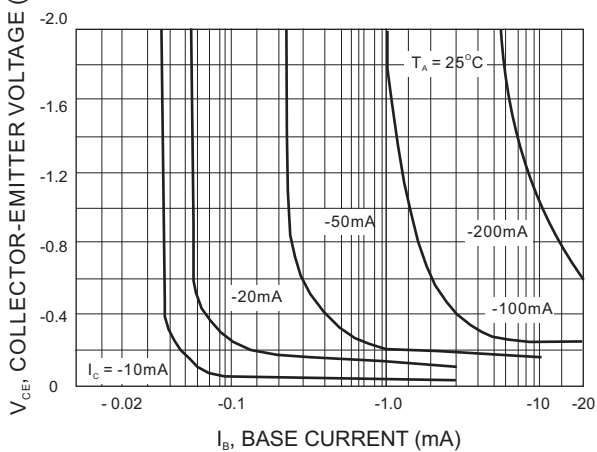


Fig. 10-BASE-EMITTER TEMPERATURE COEFFICIENT

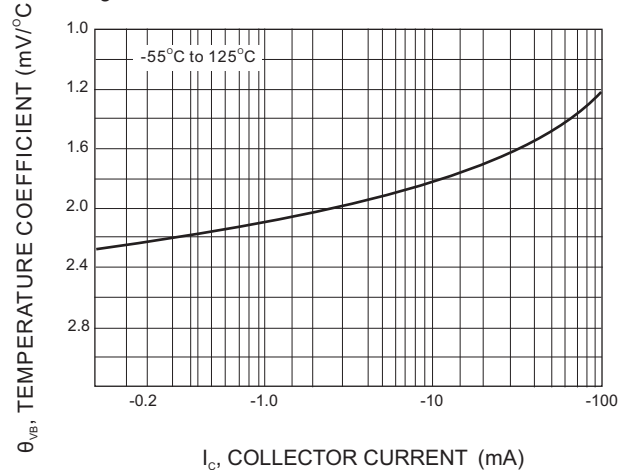


Fig. 11.-CAPACITANCE

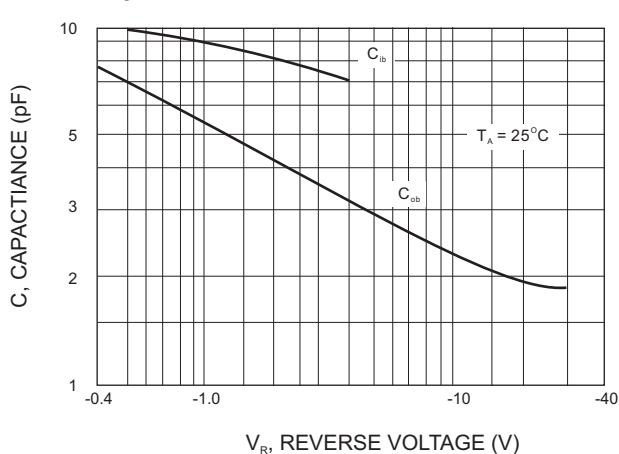
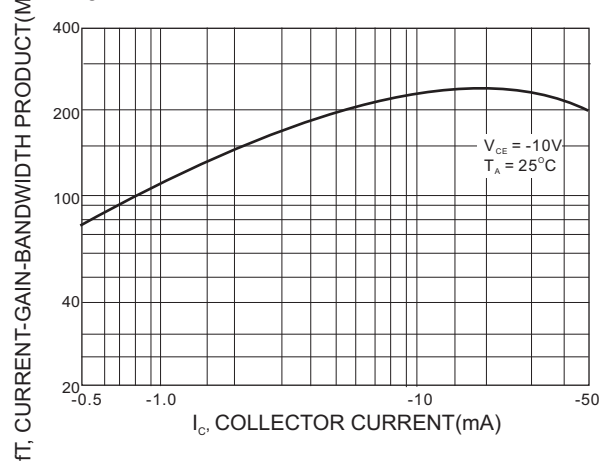
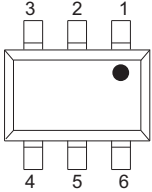
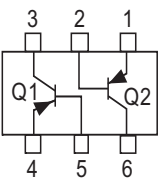


Fig. 12- CURRENT-GAIN-BANDEIDTH PRODUCT



BC856ADW / BC856BDW / BC857BDW BC857CDW / BC858BDW / BC858CDW

Pinning information

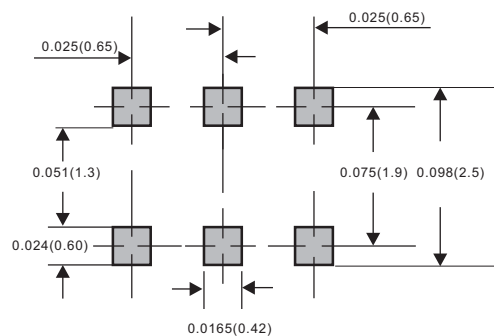
Simplified outline	Symbol
	

Marking

Type number	Marking code
BC856ADW	3A
BC856BDW	3B
BC857BDW	3F
BC857CDW	3G
BC858BDW	3K
BC858CDW	3L

Suggested solder pad layout

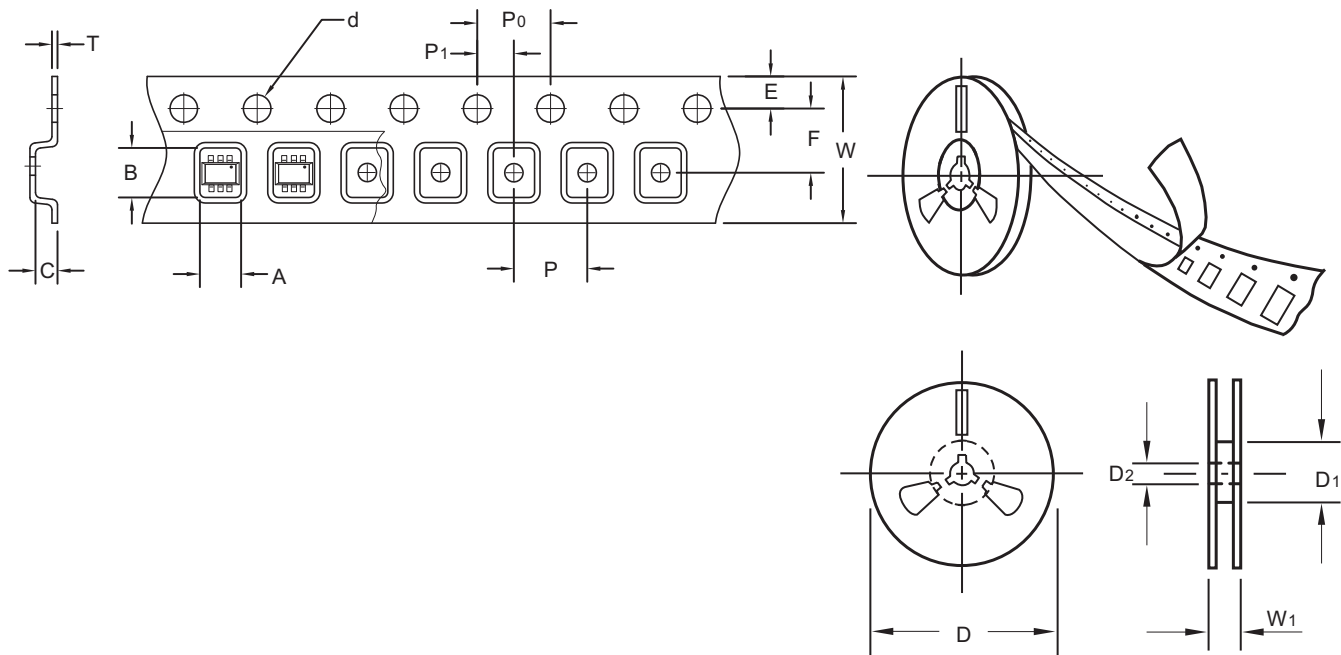
SOT-363



Dimensions in inches and (millimeters)

BC856ADW / BC856BDW / BC857BDW BC857CDW / BC858BDW / BC858CDW

Packing information



unit:mm

Item	Symbol	Tolerance	SOT-363
Carrier width	A	0.1	2.36
Carrier length	B	0.1	2.40
Carrier depth	C	0.1	1.20
Sprocket hole	d	0.1	1.50
13" Reel outside diameter	D	2.0	-
13" Reel inner diameter	D ₁	min	-
7" Reel outside diameter	D	2.0	178.00
7" Reel inner diameter	D ₁	min	62.00
Feed hole diameter	D ₂	0.5	13.00
Sprocket hole position	E	0.1	1.75
Punch hole position	F	0.1	3.50
Punch hole pitch	P	0.1	4.00
Sprocket hole pitch	P ₀	0.1	4.00
Embossment center	P ₁	0.1	2.00
Overall tape thickness	T	0.1	0.23
Tape width	W	0.3	8.00
Reel width	W ₁	1.0	11.40

Note: Devices are packed in accordance with EIA standard RS-481-A and specifications listed above.

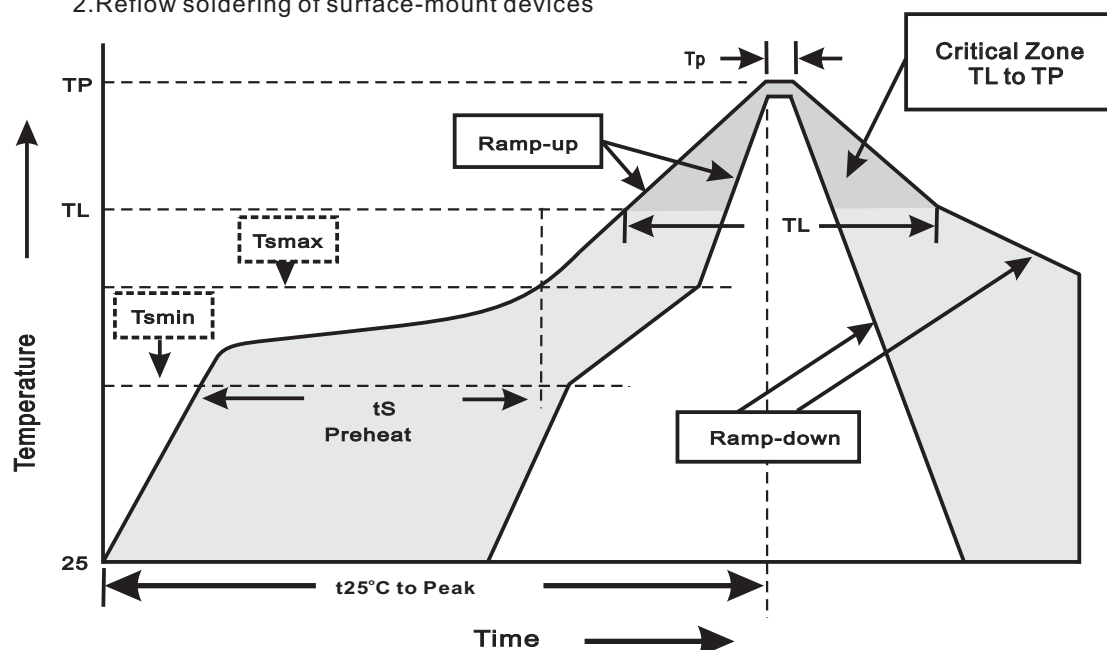
BC856ADW / BC856BDW / BC857BDW BC857CDW / BC858BDW / BC858CDW

Reel packing

PACKAGE	REEL SIZE	REEL (pcs)	COMPONENT SPACING (m/m)	BOX (pcs)	INNER BOX (m/m)	REEL DIA, (m/m)	CARTON SIZE (m/m)	CARTON (pcs)	APPROX. GROSS WEIGHT (kg)
SOT-363	7"	3,000	4.0	30,000	183*183*123	178	382*262*387	240,000	9.50

Suggested thermal profiles for soldering processes

- 1.Storage environment: Temperature=5°C~40°C Humidity=55%±25%
- 2.Reflow soldering of surface-mount devices



3.Reflow soldering

Profile Feature	Soldering Condition
Average ramp-up rate(T _L to T _P)	<3°C/sec
Preheat -Temperature Min(T _{smmin}) -Temperature Max(T _{smmax}) -Time(min to max)(t _s)	150°C 200°C 60~120sec
T _{smmax} to T _L -Ramp-upRate	<3°C/sec
Time maintained above: -Temperature(T _L) -Time(t _L)	217°C 60~260sec
Peak Temperature(T _P)	255°C-0/+5°C
Time within 5°C of actual Peak Temperature(t _P)	10~30sec
Ramp-down Rate	<6°C/sec
Time 25°C to Peak Temperature	<6minutes