Ordering number : EN3582A

SANYO Semiconductors

DATA SHEET

An ON Semiconductor Company

2SA1768 — PNP Epitaxial Planar Silicon Transistor

High-Voltage Switching Applications

Applicaitons

- Color TV sound output, converter, inverter

Features

- Adoption of MBIT process
- High breakdown voltage, large current capacity
- Fast switching speed

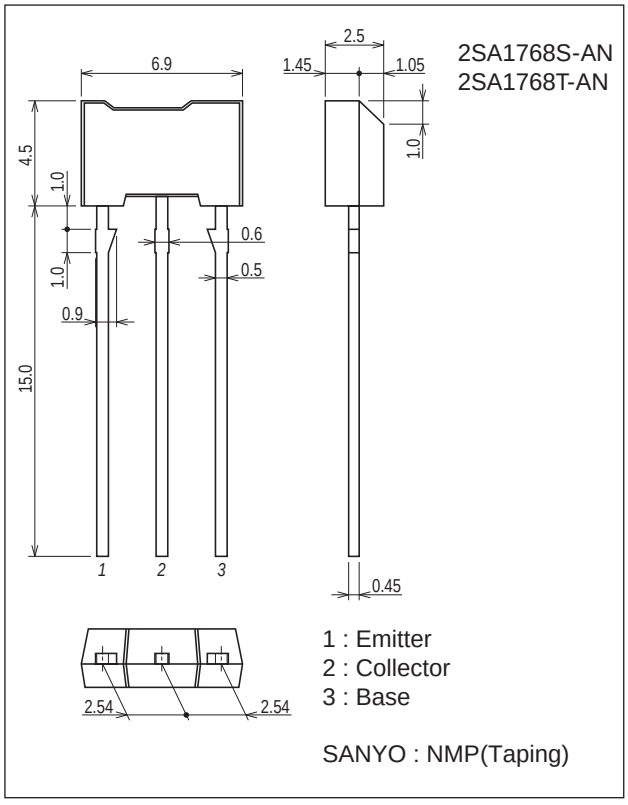
Specifications

Absolute Maximum Ratings at Ta=25°C

Parameter	Symbol	Conditions	Ratings	Unit
Collector-to-Base Voltage	V_{CBO}		−180	V
Collector-to-Emitter Voltage	V_{CEO}		−160	V
Emitter-to-Base Voltage	V_{EBO}		−6	V
Collector Current	I_C		−0.7	A
Collector Current (Pulse)	I_{CP}		−1.5	A
Collector Dissipation	P_C		1	W
Junction Temperature	Tj		150	°C
Storage Temperature	Tstg		−55 to +150	°C

Package Dimensions

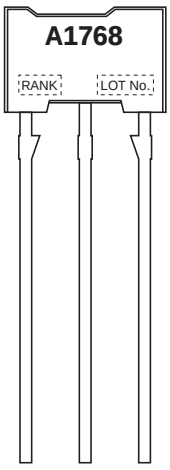
unit : mm (typ)
7540-001



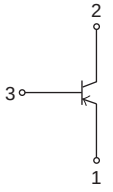
Product & Package Information

- Package : NMP(Taping)
- JEITA, JEDEC : SC-71
- Minimum Packing Quantity : 2,500 pcs./box

Marking(NMP(Taping))



Electrical Connection



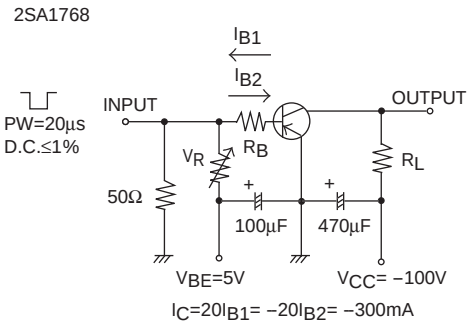
Electrical Characteristics at Ta=25°C

Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Collector Cutoff Current	I_{CBO}	V_{CB}=−120V, I_E=0A			−0.1	μA
Emitter Cutoff Current	I_{EBO}	V_{EB}=−4V, I_C=0A			−0.1	μA
DC Current Gain	$h_{FE}1$	V_{CE}=−5V, I_C=−100mA	140*		400*	
	$h_{FE}2$	V_{CE}=−5V, I_C=−10mA	90			
Gain-Bandwidth Product	f_T	V_{CE}=−10V, I_C=−50mA		120		MHz
Output Capacitance	Cob	V_{CB}=−10V, f=1MHz		11		pF
Collector-to-Emitter Saturation Voltage	V_{CE}(sat)	I_C=−250mA, I_B=−25mA		−0.2	−0.5	V
Base-to-Emitter Saturation Voltage	V_{BE}(sat)			−0.85	−1.2	V
Collector-to-Base Breakdown Voltage	$V_{(BR)CBO}$	I_C=−10μA, I_E=0A	−180			V
Collector-to-Emitter Breakdown Voltage	$V_{(BR)CEO}$	I_C=−1mA, R_{BE}=∞	−160			V
Emitter-to-Base Breakdown Voltage	$V_{(BR)EBO}$	I_E=−10μA, I_C=0A	−6			V
Turn-ON Time	t_{on}	See specified Test Circuit.		60		ns
Storage Time	t_{stg}			900		ns
Fall Time	t_f			60		ns

* : The 2SA1768 is classified by 100mA h_{FE} as follows :

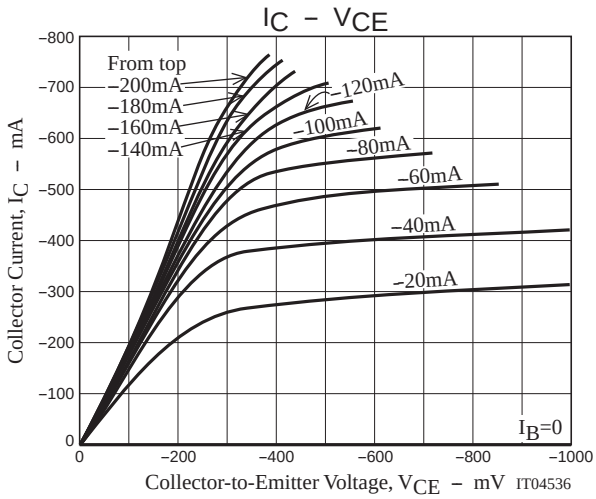
Rank	S	T
h_{FE}	140 to 280	200 to 400

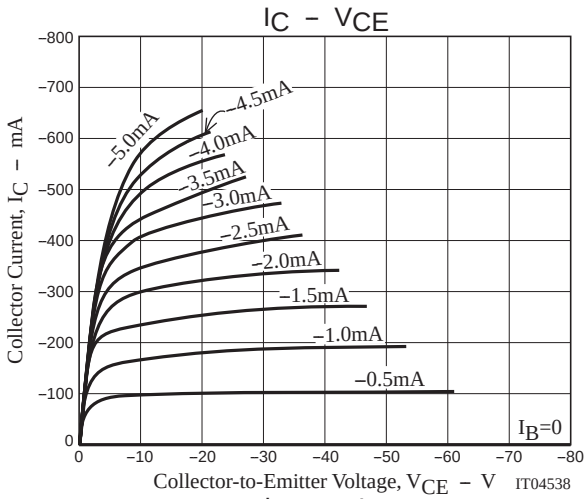
Switching Time Test Circuit

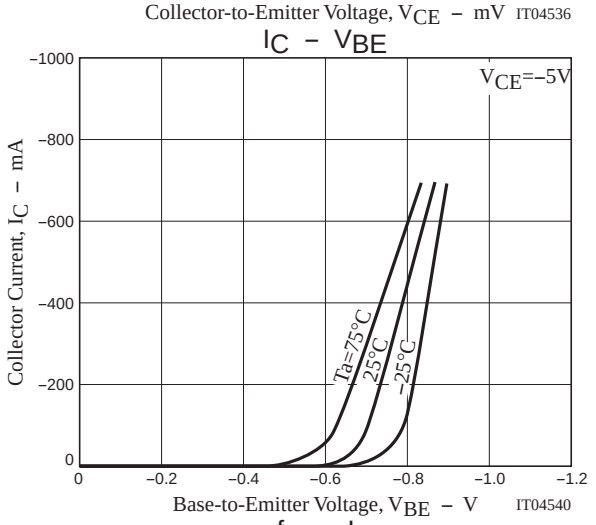


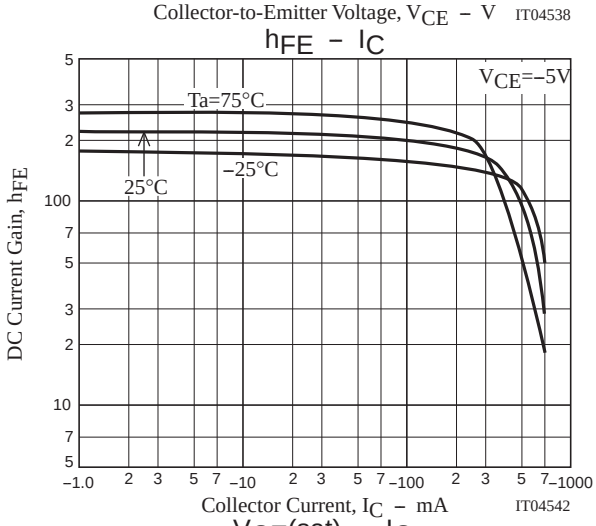
Ordering Information

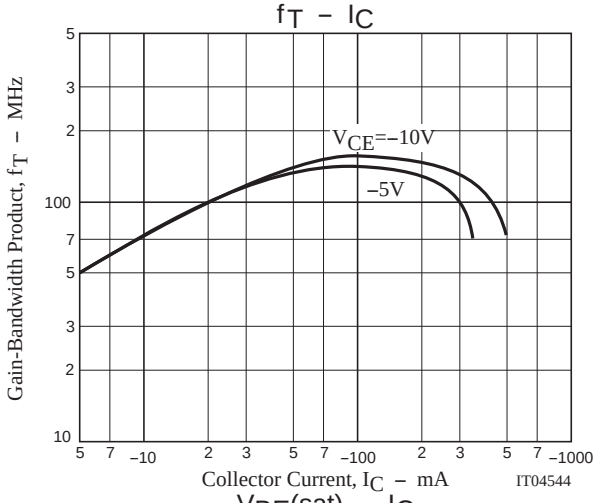
Device	Package	Shipping	memo
2SA1768S-AN	NMP(Taping)	2,500pcs./box	Pb Free
2SA1768T-AN	NMP(Taping)	2,500pcs./box	

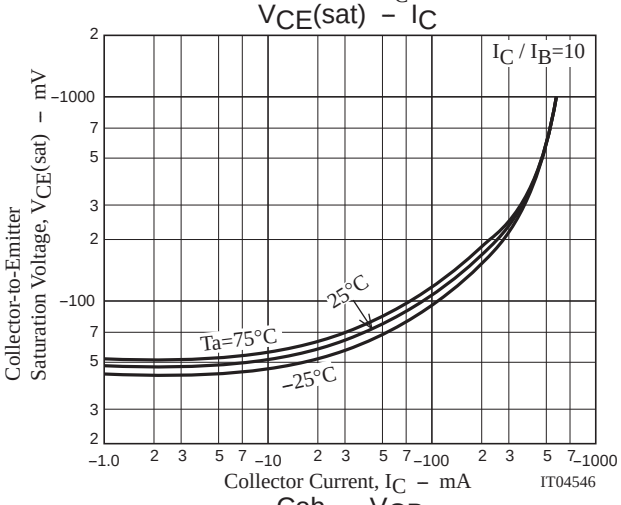

IC – VCE
From top
–200mA
–180mA
–160mA
–140mA
–120mA
–100mA
–80mA
–60mA
–40mA
–20mA
IB=0
Collector Current, IC – mA
Collector-to-Emitter Voltage, VCE – mV
IT04536

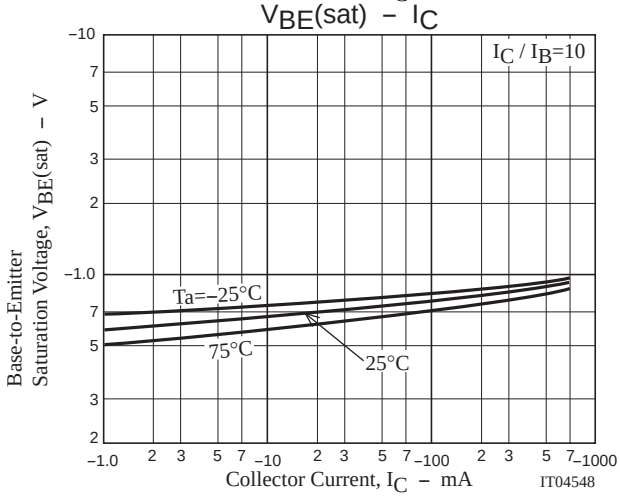

IC – VCE
–4.5mA
–5.0mA
–4.0mA
–3.5mA
–3.0mA
–2.5mA
–2.0mA
–1.5mA
–1.0mA
–0.5mA
IB=0
Collector Current, IC – mA
Collector-to-Emitter Voltage, VCE – V
IT04538

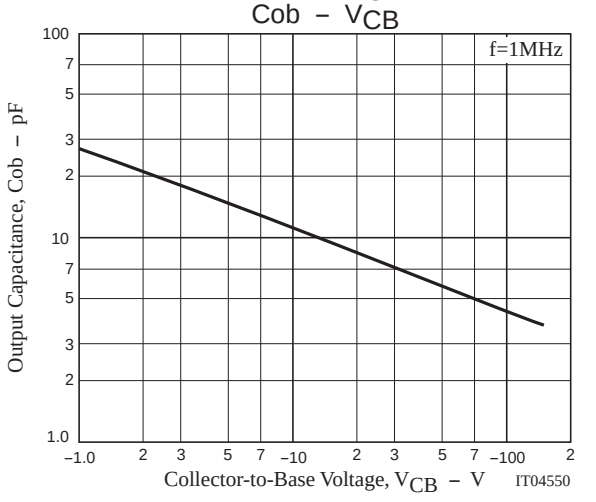

IC – VBE
VCE=–5V
Ta=75°C
25°C
–25°C
Collector Current, IC – mA
Base-to-Emitter Voltage, VBE – V
IT04540


hFE – IC
VCE=–5V
Ta=75°C
25°C
–25°C
DC Current Gain, hFE
Collector Current, IC – mA
IT04542

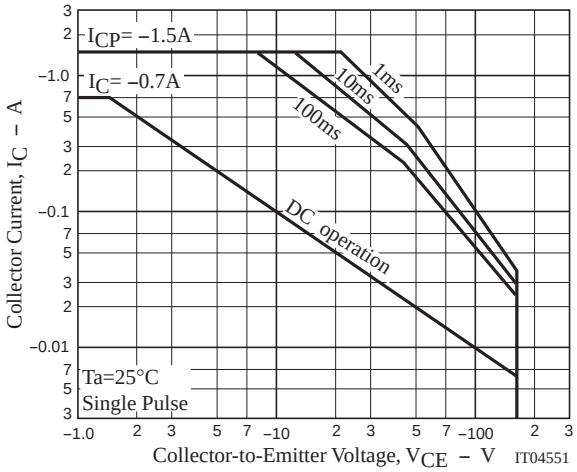

fT – IC
VCE=–10V
–5V
Gain-Bandwidth Product, fT – MHz
Collector Current, IC – mA
IT04544


VCE(sat) – IC
IC / IB=10
25°C
Ta=75°C
–25°C
Collector-to-Emitter Saturation Voltage, VCE(sat) – mV
Collector Current, IC – mA
IT04546

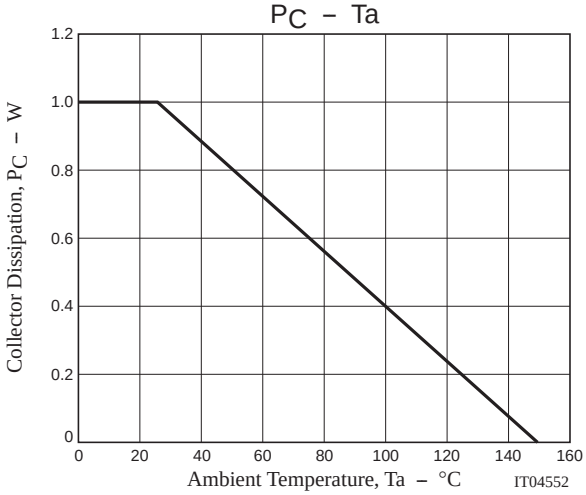

VBE(sat) – IC
IC / IB=10
Ta=–25°C
75°C
25°C
Base-to-Emitter Saturation Voltage, VBE(sat) – V
Collector Current, IC – mA
IT04548


Cob – VCB
f=1MHz
Output Capacitance, Cob – pF
Collector-to-Base Voltage, VCB – V
IT04550

ASO


ICP= –1.5A
IC= –0.7A
1ms
10ms
100ms
DC operation
Ta=25°C
Single Pulse
Collector Current, IC – A
Collector-to-Emitter Voltage, VCE – V
IT04551

PC – Ta


Collector Dissipation, PC – W
Ambient Temperature, Ta – °C
IT04552

Bag Packing Specification

2SA1768S-AN, 2SA1768T-AN

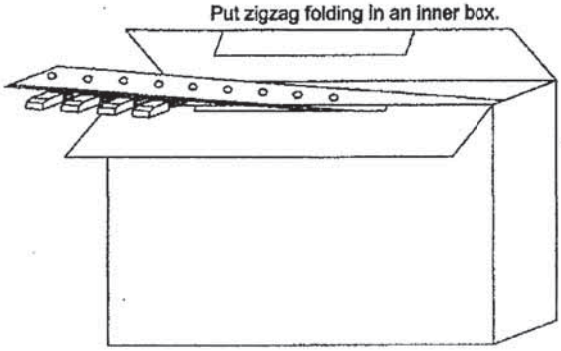
NMP (Zigzag folding)

Storage package Outline name	Package type	Maximum Number of devices contained (pcs.)		Packing format	
		Inner box No.	Storage quantity	Outer box (C—6)	Outer box (C—8)
NMP	AN/AZ	C—3 Inner box Dimensions :mm(external) 330×45×125	2,500	8 inner boxes contained(20,000pcs.) Outer box Dimensions:mm(external) 585×345×195	4 inner boxes contained(10,000pcs.) Outer box Dimensions:mm(external) 345×300×195

1. Packing format

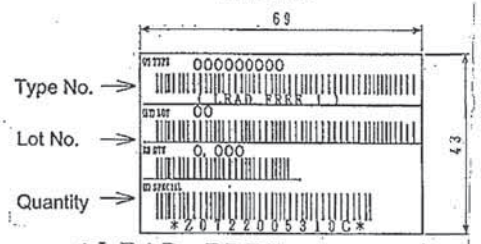
Packing method

Put zigzag folding in an inner box.



2. Bar code label

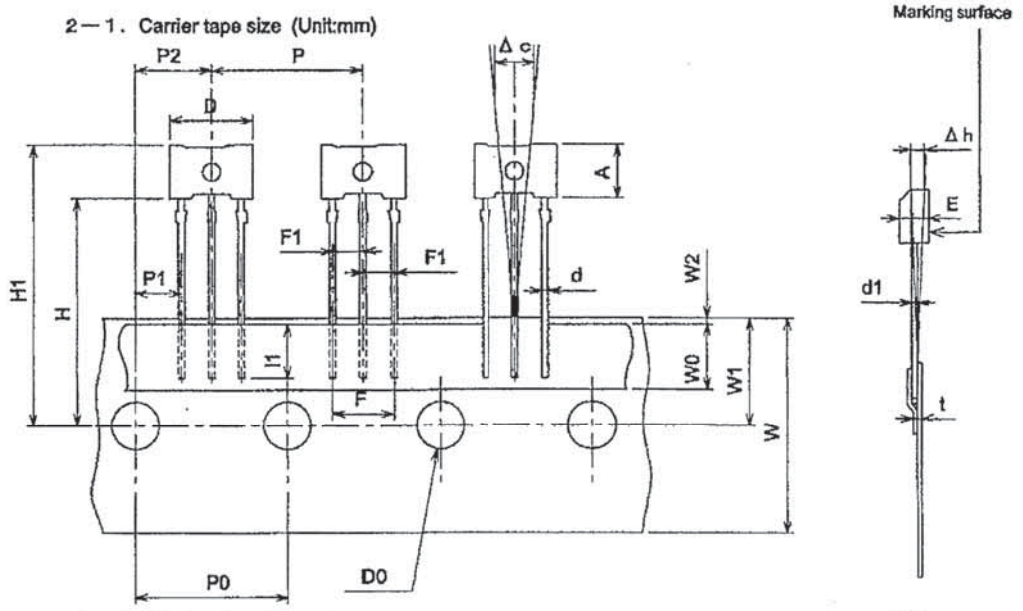
(Unit : mm)



*LEAD FREE 1:
Lead-free External terminal surface treatment product.

2. Taping specifications

2—1. Carrier tape size (Unit:mm)



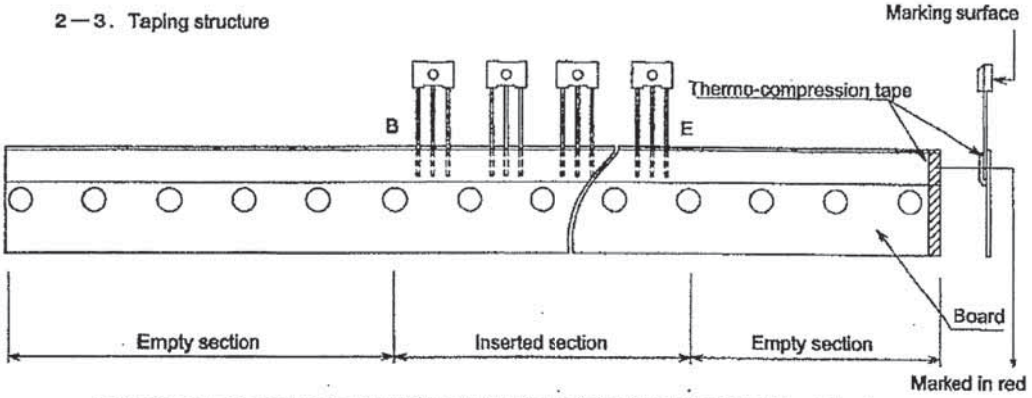
2—2. Taping size standard

Unit:mm

Item	Symbol	Standard	Tolerance
Work piece outside diameter	D	6.9	±0.2
	E	2.5	±0.2
Work piece height	A	4.5	±0.2
Lead wire diameter	d	0.5	±0.1
Lead wire thickness	d1	0.45	±0.1
Bonded lead wire	I1	3.0MIN	
Pitch between products	P	12.7	±0.5
Pitch between perforations	P0	12.7	±0.2
Total pitch for 21 perforations	P0×20	254.0	±1.0
Distance between lead wire	F	5.0	+0.8 -0.2
Lead wire pitch distance	F1	2.54	+0.4 -0.1
Displacement of perforations	P1	3.81	±0.3
	P2	6.35	±0.3
Displacement of tape	W2	0～0.5	

Item	Symbol	Standard	Tolerance
Tape width	W	18.0	±0.5
Adhesive tape	W0	6.0	±0.5
Displacement of perforations	W1	9.0	±0.5
Work piece bottom surface position	H	19.0	+1.0 -0.5
Work piece upper limit position	H1	23.5	±1.0
Perforations diameter	D0	φ4.0	±0.2
Tape thickness (total thickness)	t	0.6	±0.2
Product inclination	Δc	0	±0.7
Product inclination	Δh	0	±1.0

2—3. Taping structure



- Provide an empty section for about three to five pieces in leading and end portions of the tape.
- Provide an empty section in the fold-back portion.
- Provide marking in red to the E-side end of the board.

Outline Drawing

2SA1768S-AN, 2SA1768T-AN