



# 2SA2210

## Bipolar Transistor -50V, -20A, Low VCE(sat) PNP TO-220F-3SG

ON Semiconductor®

<http://onsemi.com>

### Applications

- Relay drivers, lamp drivers, motor drivers.

### Features

- Adoption of MBIT processes
- Low collector-to-emitter saturation voltage
- Large current capacitance
- High-speed switching

### Specifications

#### Absolute Maximum Ratings at Ta=25°C

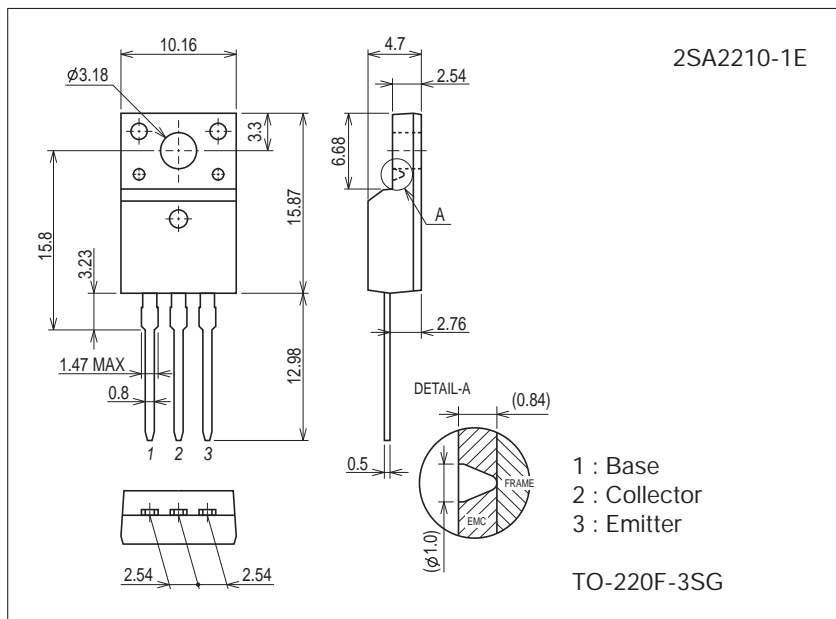
Parameter	Symbol	Conditions	Ratings	Unit
Collector-to-Base Voltage	V <sub>CBO</sub>		-50	V
Collector-to-Emitter Voltage	V <sub>CEO</sub>		-50	V
Emitter-to-Base Voltage	V <sub>EBO</sub>		-6	V
Collector Current	I <sub>C</sub>		-20	A
Collector Current (Pulse)	I <sub>CP</sub>		-25	A
Base Current	I <sub>B</sub>		-3	A
Collector Dissipation	P <sub>C</sub>		2	W
		T <sub>c</sub> =25°C	30	W
Junction Temperature	T <sub>j</sub>		150	°C
Storage Temperature	T <sub>stg</sub>		-55 to +150	°C

Stresses exceeding Maximum Ratings may damage the device. Maximum Ratings are stress ratings only. Functional operation above the Recommended Operating Conditions is not implied. Extended exposure to stresses above the Recommended Operating Conditions may affect device reliability.

### Package Dimensions

unit : mm (typ)

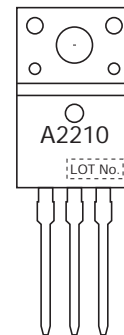
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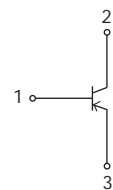
### Product & Package Information

- Package : TO-220F-3SG
- JEITA, JEDEC : SC-67
- Minimum Packing Quantity : 50 pcs./magazine

### Marking



### Electrical Connection

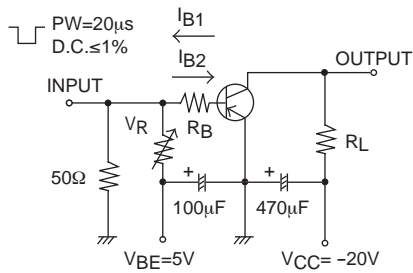


## 2SA2210

### Electrical Characteristics at $T_a=25^\circ\text{C}$

Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Collector Cutoff Current	$I_{CBO}$	$V_{CB} = -40\text{V}, I_E = 0\text{A}$			-10	$\mu\text{A}$
Emitter Cutoff Current	$I_{EBO}$	$V_{EB} = -4\text{V}, I_C = 0\text{A}$			-10	$\mu\text{A}$
DC Current Gain	$h_{FE}$	$V_{CE} = -2\text{V}, I_C = -1\text{A}$	150		450	
Gain-Bandwidth Product	$f_T$	$V_{CE} = -10\text{V}, I_C = -1\text{A}$		140		MHz
Output Capacitance	$C_{ob}$	$V_{CB} = -10\text{V}, f = 1\text{MHz}$		215		pF
Collector-to-Emitter Saturation Voltage	$V_{CE(sat)}$	$I_C = -7\text{A}, I_B = -350\text{mA}$		-200	-500	mV
Base-to-Emitter Saturation Voltage	$V_{BE(sat)}$	$I_C = -7\text{A}, I_B = -350\text{mA}$			-1.2	V
Collector-to-Base Breakdown Voltage	$V_{(BR)CBO}$	$I_C = -100\mu\text{A}, I_E = 0\text{A}$	-50			V
Collector-to-Emitter Breakdown Voltage	$V_{(BR)CEO}$	$I_C = -1\text{mA}, R_{BE} = \infty$	-50			V
Emitter-to-Base Breakdown Voltage	$V_{(BR)EBO}$	$I_E = -100\mu\text{A}, I_C = 0\text{A}$	-6			V
Turn-On Time	$t_{on}$	See specified Test Circuit		60		ns
Storage Time	$t_{stg}$			270		ns
Fall Time	$t_f$			20		ns

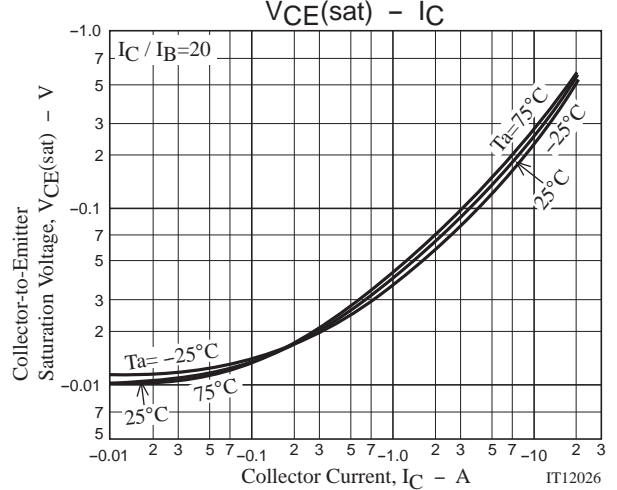
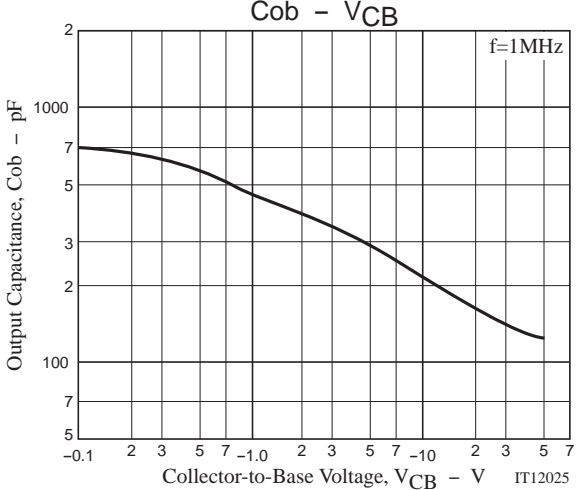
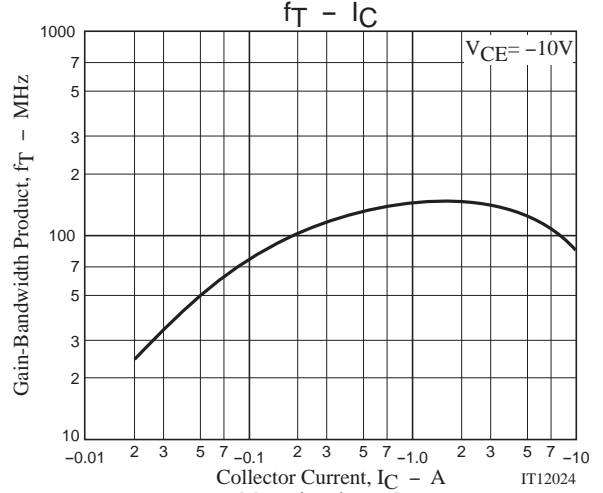
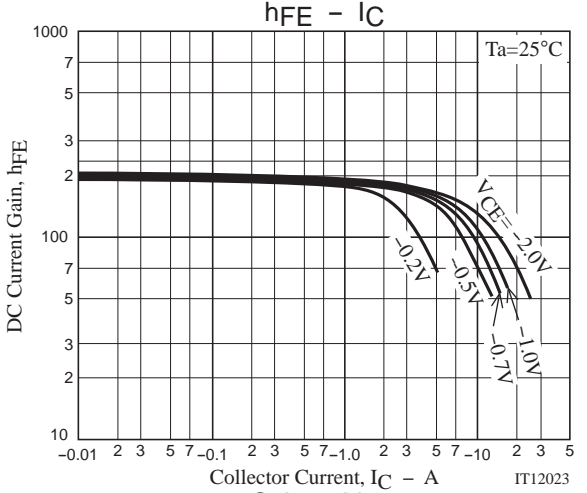
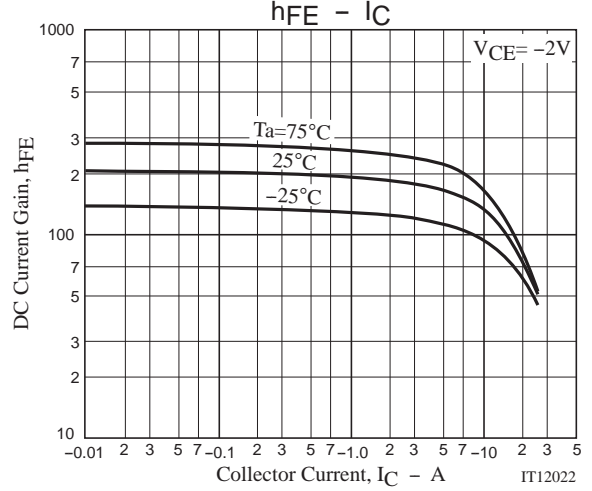
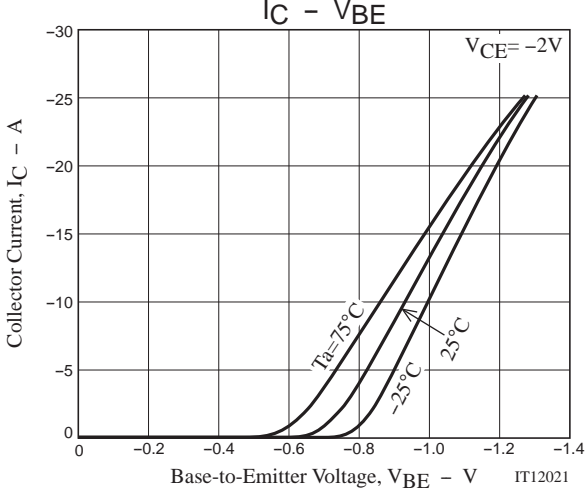
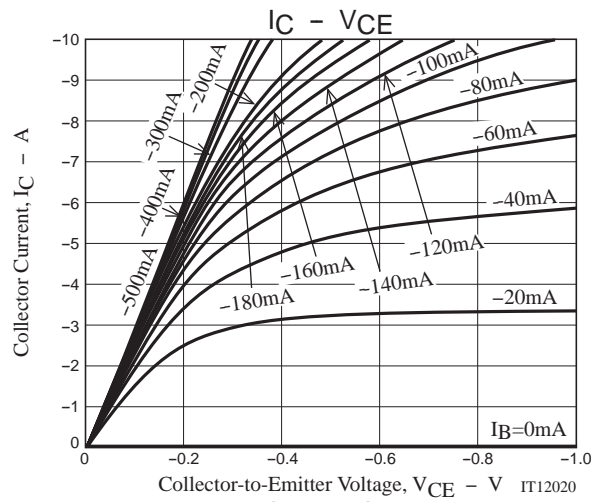
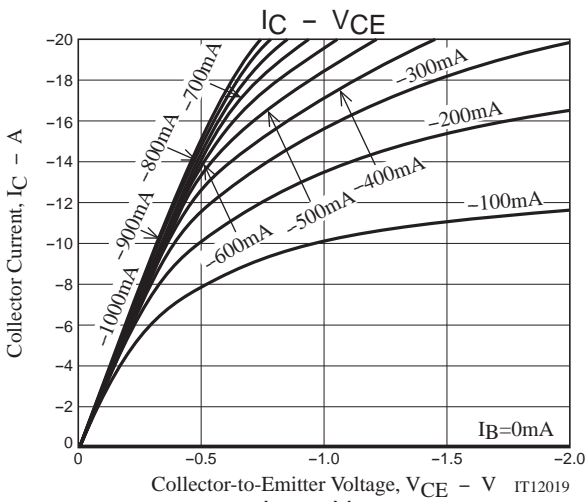
### Switching Time Test Circuit

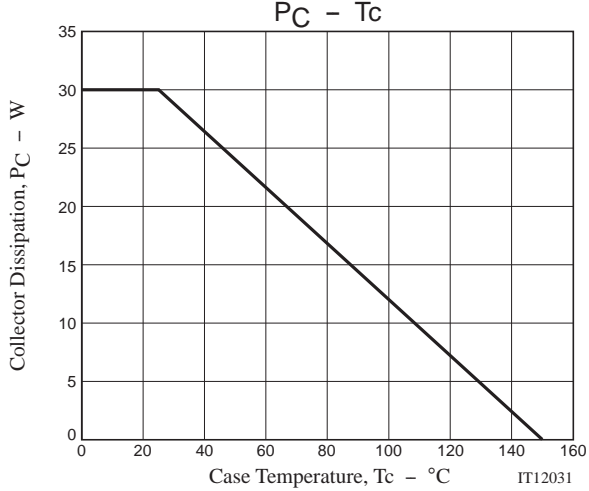
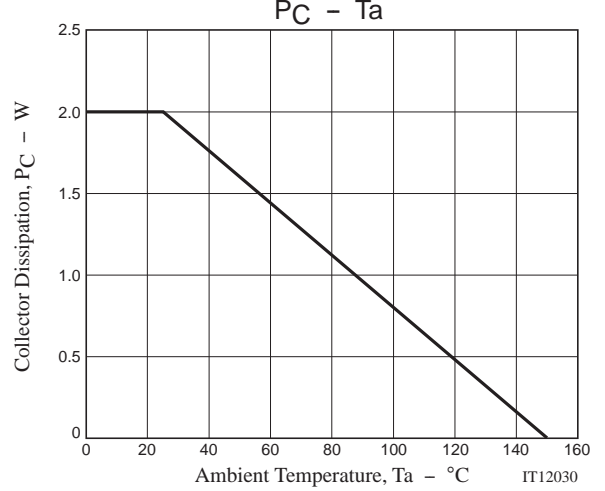
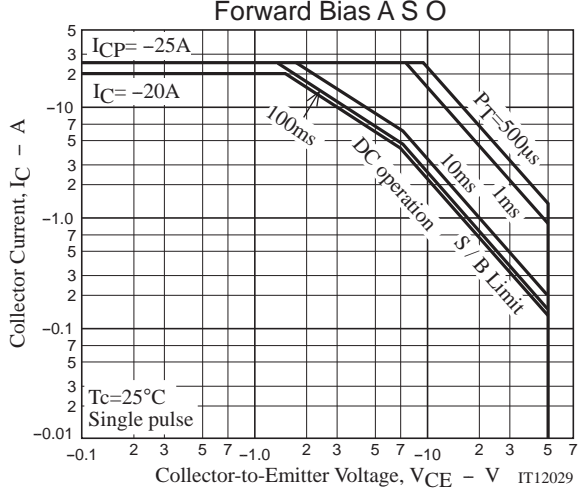
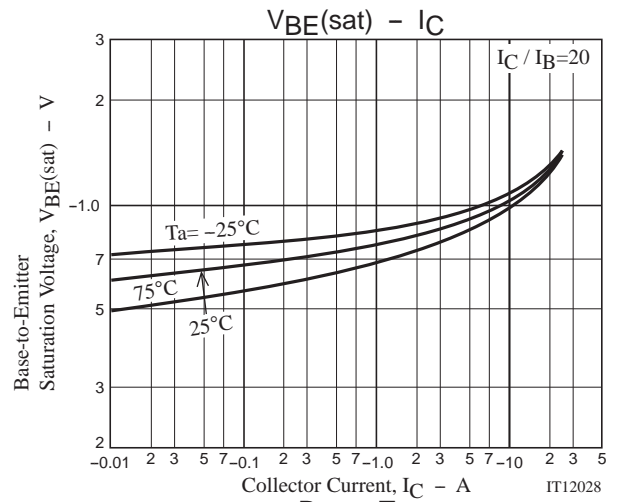
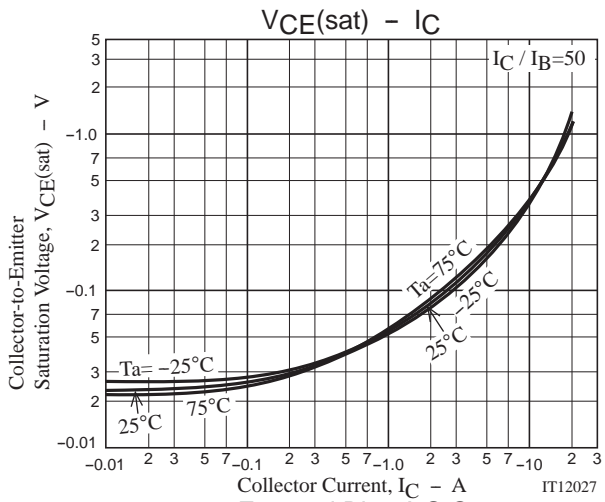


$$I_C = 20I_{B1} = -20I_{B2} = -7\text{A}$$

### Ordering Information

Device	Package	Shipping	memo
2SA2210-1E	TO-220F-3SG	50pcs./magazine	Pb Free





Magazine Specification

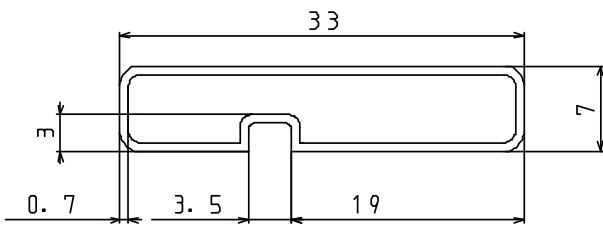
2SA2210-1E

1. Packing Format

Package Name	Magazine Name	Maximum Number of devices contained (pcs)			Packing format	
		Magazine	Inner box	Outer box	Inner BOX	Outer BOX
TO-220F-3SG	TO-220F	50	1,000	4,000	SPD-0V0001 20 magazines contained Dimensions:mm (external) 568×150×55	SPT-081029 4 inner boxes contained Dimensions:mm (external) 590×225×178

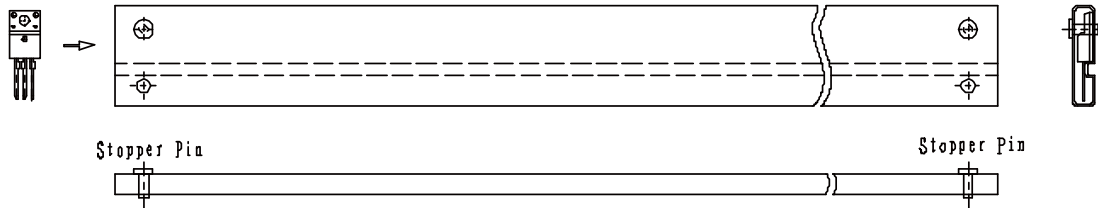
2. Magazine dimensions

(unit:mm)

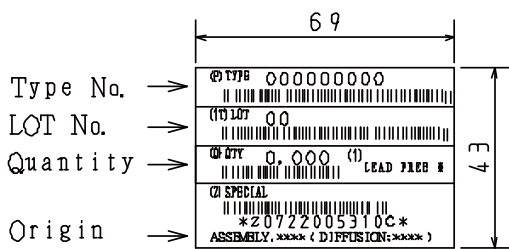


Tolerance=±0.3mm  
 Thickness=0.7±0.2mm  
 Length =532.5±2mm  
 Material =PVC (Antistatic treatment)

3. Storage method to magazine

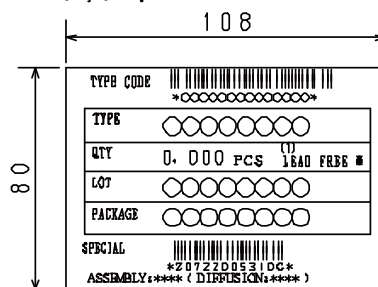


4. Inner box label (unit:mm)



5. Outer box label (unit:mm)

It is a label at the time of factory shipments.  
 The form of a label may change in physical  
 distribution process.



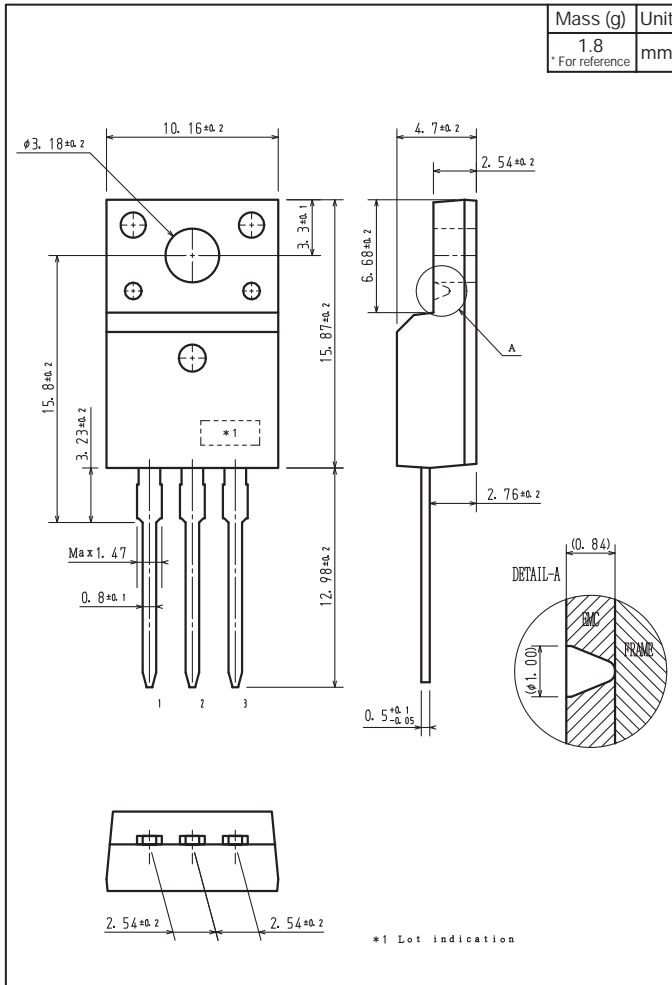
NOTE (1)

The LEAD FREE \* description shows that the surface treatment of the terminal is lead free.

Label	JEITA Phase
LEAD FREE 3	JEITA Phase 3A

Outline Drawing

2SA2210-1E



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