Ordering number : ENA1799B

2SA2222SG

Bipolar Transistor
−50V, −10A, Low V_{CE}(sat) PNP TO-220F-3FS

ON Semiconductor®
http://onsemi.com

Applications

・ Relay drivers, lamp drivers, motor drivers

Features

・ Adoption of MBIT process
・ Large current capacity (I_C=−10A)
・ Low collector-to-emitter saturation voltage (V_{CE}(sat)=−250mV(typ.))
・ High-speed switching (t_f=22ns(typ.))

Specifications

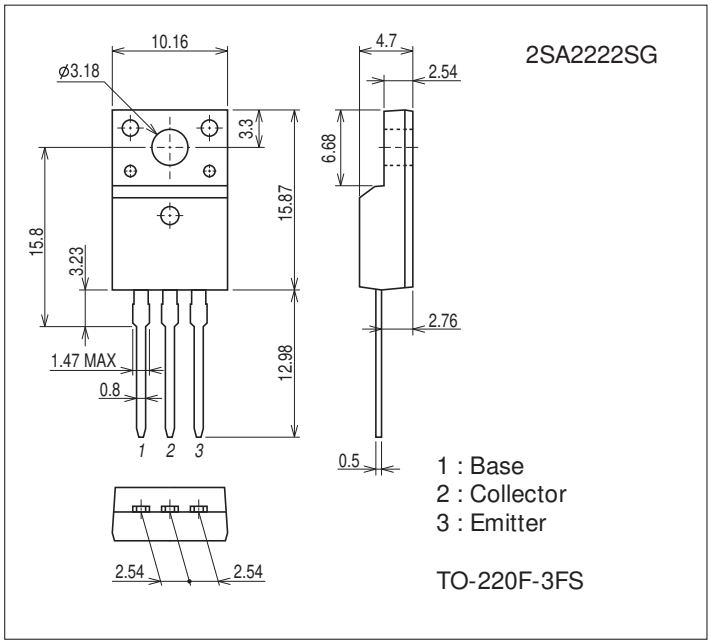
Absolute Maximum Ratings at Ta=25°C

Parameter	Symbol	Conditions	Ratings	Unit
Collector-to-Base Voltage	V_{CBO}		−50	V
Collector-to-Emitter Voltage	V_{CEO}		−50	V
Emitter-to-Base Voltage	V_{EBO}		−6	V
Collector Current	I_C		−10	A
Collector Current (Pulse)	I_{CP}		−13	A
Base Current	I_B		−2	A
Collector Dissipation	P_C	Tc=25°C, P_T≤1s	25	W
Junction Temperature	Tj		150	°C
Storage Temperature	Tstg		−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

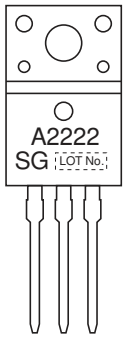
unit : mm (typ)
7528-003



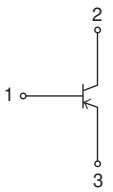
Product & Package Information

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

Marking



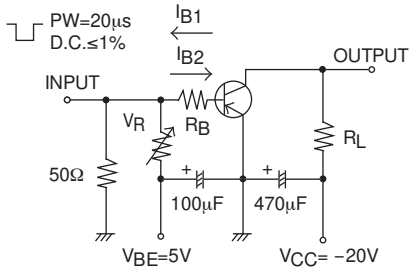
Electrical Connection



Electrical Characteristics at Ta=25°C

Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Collector Cutoff Current	I_{CBO}	V_{CB}=−40V, I_E=0A			−10	μA
Emitter Cutoff Current	I_{EBO}	V_{EB}=−4V, I_C=0A			−10	μA
DC Current Gain	h_{FE}	V_{CE}=−2V, I_C=−270mA	150		450	
Gain-Bandwidth Product	f_T	V_{CE}=−10V, I_C=−1A		230		MHz
Output Capacitance	Cob	V_{CB}=−10V, f=1MHz		115		pF
Collector-to-Emitter Saturation Voltage	V_{CE}(sat)	I_C=−6A, I_B=−300mA		−250	−500	mV
Base-to-Emitter Saturation Voltage	V_{BE}(sat)	I_C=−6A, I_B=−300mA			−1.2	V
Collector-to-Base Breakdown Voltage	$V_{(BR)CBO}$	I_C=−100μA, I_E=0A	−50			V
Collector-to-Emitter Breakdown Voltage	$V_{(BR)CEO}$	I_C=−1mA, R_{BE}=∞	−50			V
Emitter-to-Base Breakdown Voltage	$V_{(BR)EBO}$	I_E=−100μA, I_C=0A	−6			V
Turn-On Time	t_{on}	See specified Test Circuit.		40		ns
Storage Time	t_{stg}			240		ns
Fall Time	t_f			22		ns

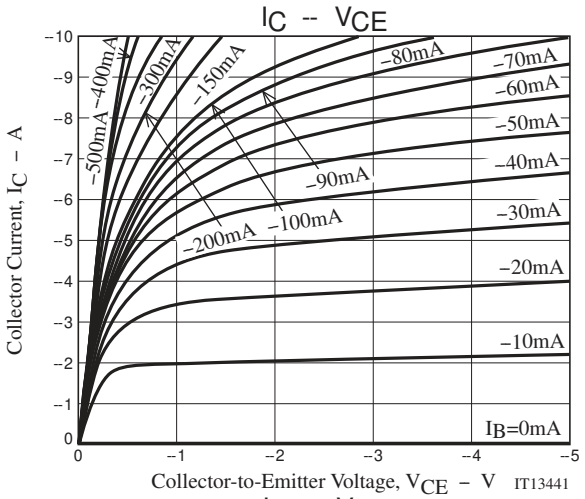
Switching Time Test Circuit

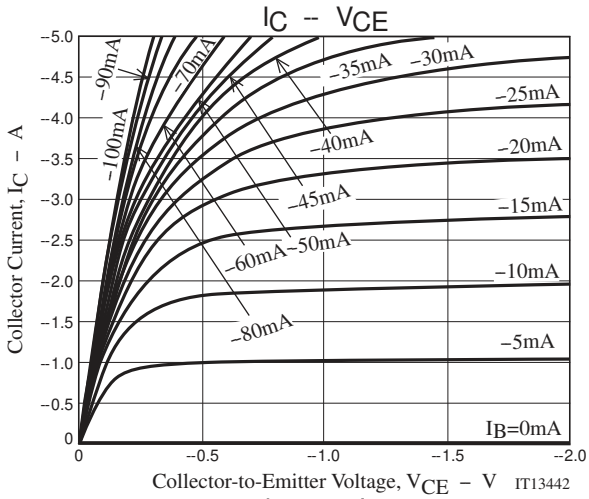


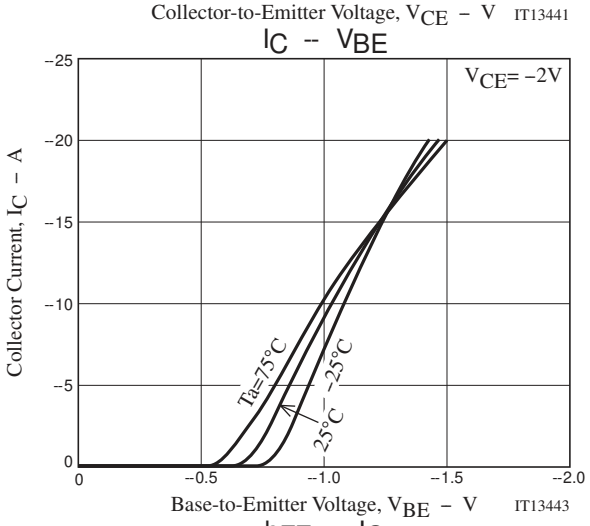
I_C=20I_{B1}= −20I_{B2}= −5A

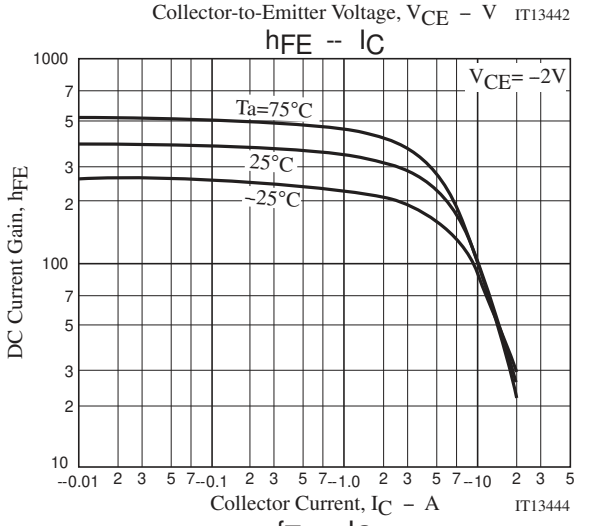
Ordering Information

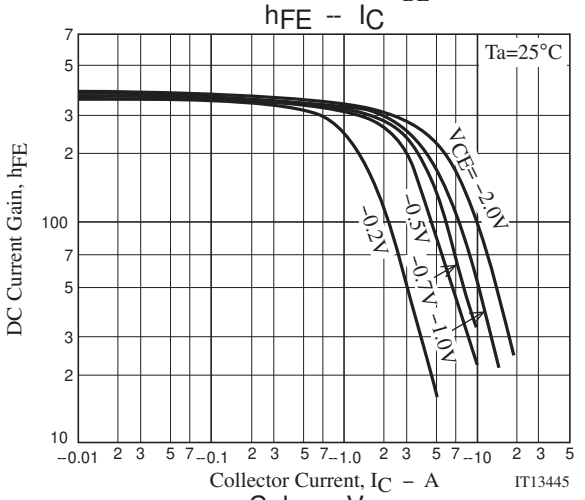
Device	Package	Shipping	memo
2SA2222SG	TO-220F-3FS	50pcs./magazine	Pb Free

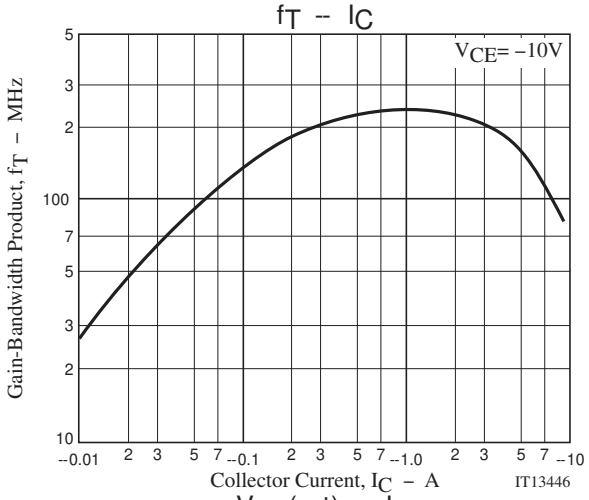

IC -- VCE
Collector Current, IC – A
Collector-to-Emitter Voltage, VCE – V
IT13441
–500mA
–400mA
–300mA
–150mA
–200mA
–100mA
–90mA
–80mA
–70mA
–60mA
–50mA
–40mA
–30mA
–20mA
–10mA
IB=0mA

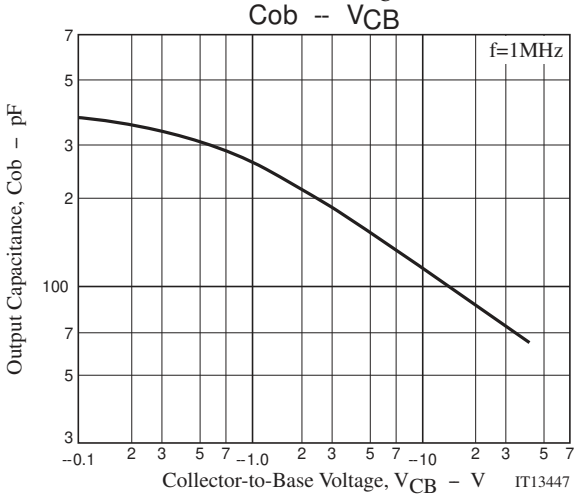

IC -- VCE
Collector Current, IC – A
Collector-to-Emitter Voltage, VCE – V
IT13442
–90mA
–70mA
–100mA
–35mA
–30mA
–25mA
–40mA
–20mA
–45mA
–15mA
–60mA
–50mA
–10mA
–80mA
–5mA
IB=0mA

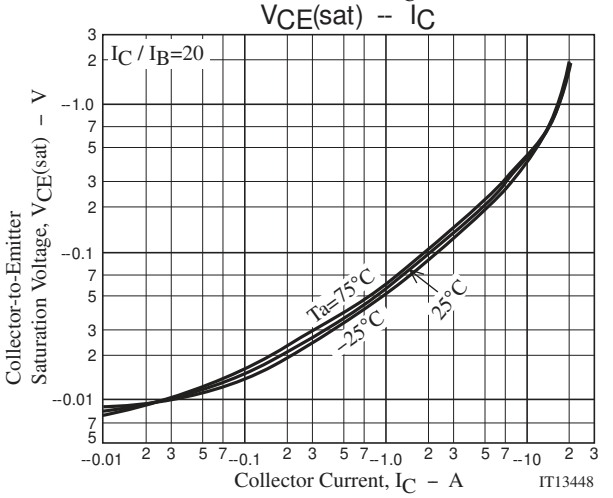

IC -- VBE
VCE= –2V
Collector Current, IC – A
Base-to-Emitter Voltage, VBE – V
IT13443
Ta=75°C
–25°C
25°C

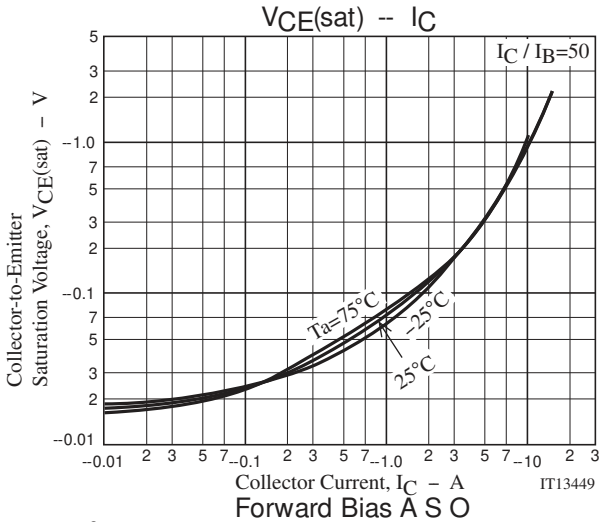

hFE -- IC
VCE= –2V
Ta=75°C
25°C
–25°C
DC Current Gain, hFE
Collector Current, IC – A
IT13444

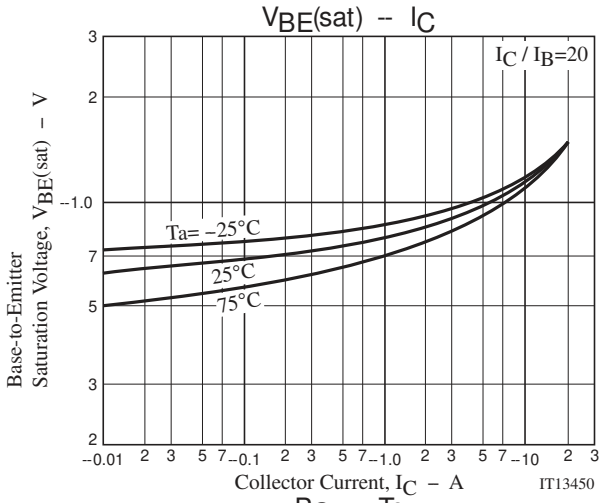

hFE -- IC
Ta=25°C
VCE= –2.0V
–0.5V
–0.2V
–0.7V
–1.0V
DC Current Gain, hFE
Collector Current, IC – A
IT13445

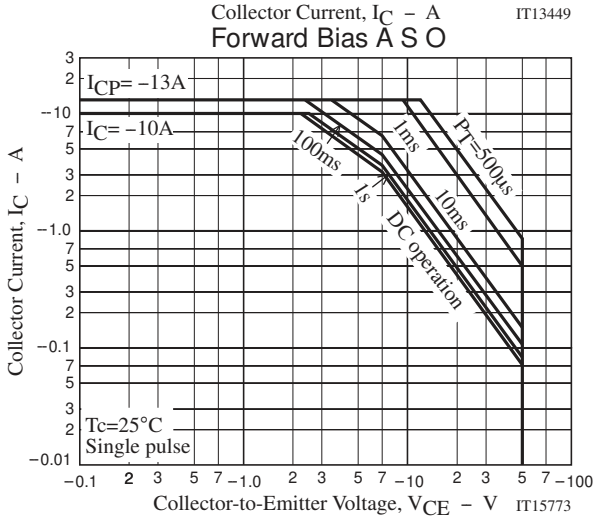

fT -- IC
VCE= –10V
Gain-Bandwidth Product, fT – MHz
Collector Current, IC – A
IT13446

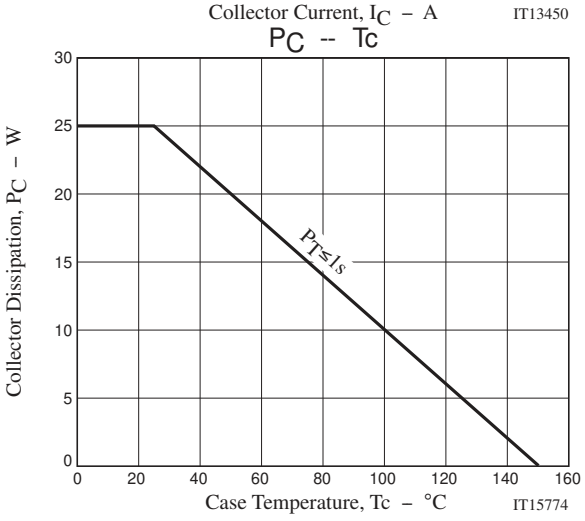

Cob -- VCB
f=1MHz
Output Capacitance, Cob – pF
Collector-to-Base Voltage, VCB – V
IT13447


VCE(sat) -- IC
IC / IB=20
Collector-to-Emitter Saturation Voltage, VCE(sat) – V
Ta=75°C
–25°C
25°C
Collector Current, IC – A
IT13448


VCE(sat) -- IC
IC / IB=50
Ta=75°C
25°C
–25°C
Collector-to-Emitter Saturation Voltage, VCE(sat) – V
Collector Current, IC – A
IT13449


VBE(sat) -- IC
IC / IB=20
Ta= –25°C
25°C
75°C
Base-to-Emitter Saturation Voltage, VBE(sat) – V
Collector Current, IC – A
IT13450


Forward Bias A S O
ICP= –13A
IC= –10A
100ms
1s
1ms
PT=500µs
10ms
DC operation
Tc=25°C
Single pulse
Collector Current, IC – A
Collector-to-Emitter Voltage, VCE – V
IT15773


PC -- Tc
PT≤1s
Collector Dissipation, PC – W
Case Temperature, Tc – °C
IT15774

Magazine Specification

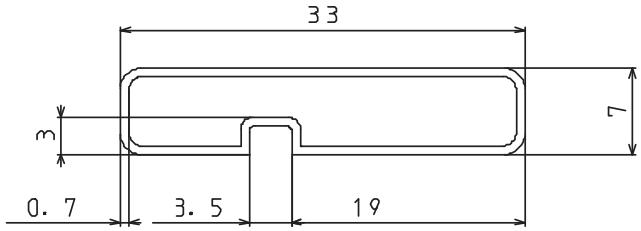
2SA2222SG

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-3FS	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

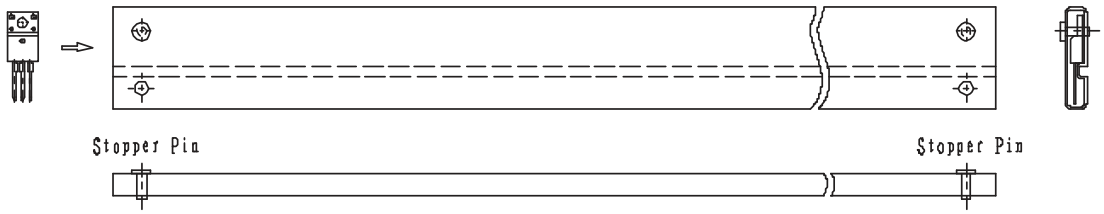
2. Magazine dimensions

(unit:mm)

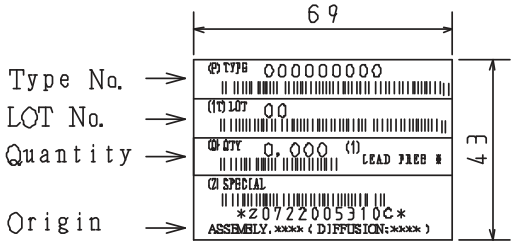


Tolerance=±0.3mm
Thickness=0.7±0.2mm
Length =532.5±2mm
Material =PVC (Antistatic treatment)

3. Storage method to magazine

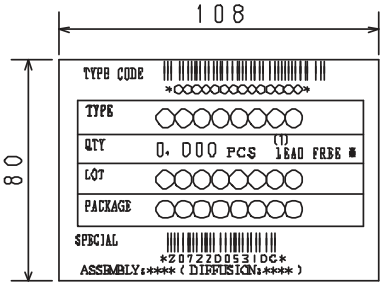


4. Inner box label (unit:mm)



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

2SA2222SG