

**2SD1235**



2010A

NPN/PNP Epitaxial Planar Silicon Transistors

T-33-09

**2SB919**

# High Current Switching Applications

©1046A

**Use**

- Large current switching of relay drivers, high-speed inverters, converters

**Features**

- Low collector-to-emitter saturation voltage:  $V_{CE(sat)} = -0.5V$  (PNP),  $0.4V$  (NPN) max.
- Large current capacity

( ) : 2SB919

**Absolute Maximum Ratings/ $T_a=25^\circ C$**

			unit
Collector to Base Voltage	$V_{CBO}$	(-)60	V
Collector to Emitter Voltage	$V_{CEO}$	(-)30	V
Emitter to Base Voltage	$V_{EBO}$	(-)6	V
Collector Current	$I_C$	(-)8	A
Peak Collector Current	$i_{cp}$	(-)15	A
Collector Dissipation	$P_C$	1.75	W
		$T_c=25^\circ C$	30
Junction Temperature	$T_j$		150 $^\circ C$
Storage Temperature	$T_{stg}$		-55 to +150 $^\circ C$

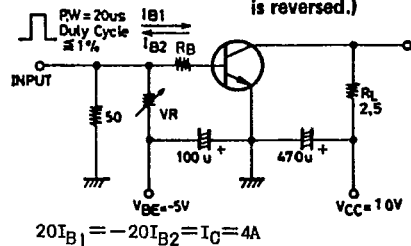
**Electrical Characteristics/ $T_a=25^\circ C$**

			min	typ	max	unit
Collector Cutoff Current	$I_{CBO}$	$V_{CB} = (-)40V, I_E = 0$			(-)0.1	mA
Emitter Cutoff Current	$I_{EBO}$	$V_{EB} = (-)4V, I_C = 0$			(-)0.1	mA
Common Emitter DC Current Gain	$h_{FE}(1)$	$V_{CE} = (-)2V, I_C = (-)1A$	70*		280*	
	$h_{FE}(2)$	$V_{CE} = (-)2V, I_C = (-)4A$	30			
Gain Band-width Product	$f_T$	$V_{CE} = (-)5V, I_C = (-)1A$		120		MHz
Collector to Emitter Saturation Voltage	$V_{CE(sat)}$	$I_C = (-)3A, I_B = (-)0.15A$			0.4 (-0.5)	V
Collector to Base Breakdown Voltage	$V_{(BR)CBO}$	$I_C = (-)1mA, I_E = 0$	(-)60			V
Collector to Emitter Breakdown Voltage	$V_{(BR)CEO}$	$I_C = (-)1mA, R_{BE} = \infty$	(-)30			V
Emitter to Base Breakdown Voltage	$V_{(BR)EBO}$	$I_E = (-)1mA, I_C = 0$	(-)6			V
Turn-on Time	$t_{on}$	See specified Test Circuit		0.1		$\mu s$
Storage Time	$t_{stg}$	"		(0.2)0.5		$\mu s$
Fall Time	$t_f$	"		0.03		$\mu s$

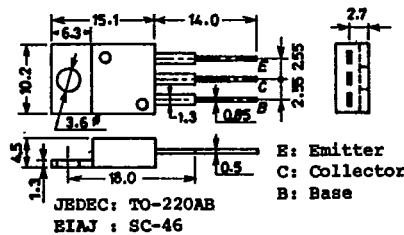
\* The 2SB919/2SD1235 are classified as follows according to  $h_{FE}$  at 1A.

70	Q	140	100	R	200	140	S	280
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**Switching Time Test Circuit (For PNP, the polarity is reversed.)**

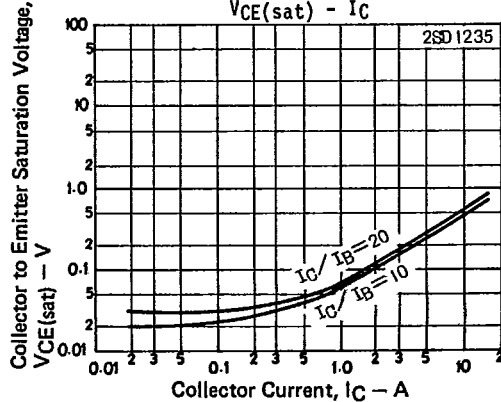
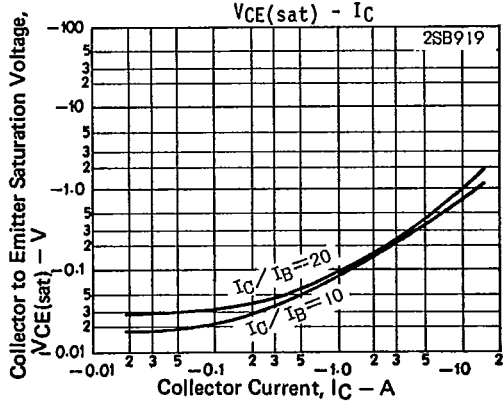
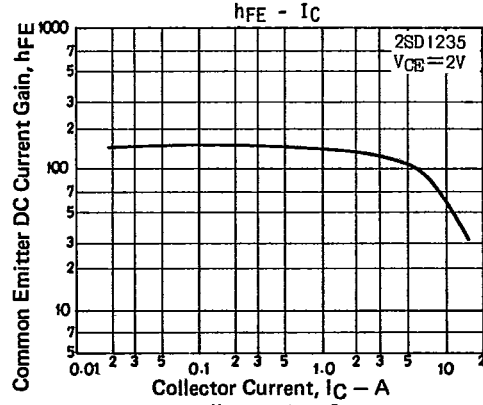
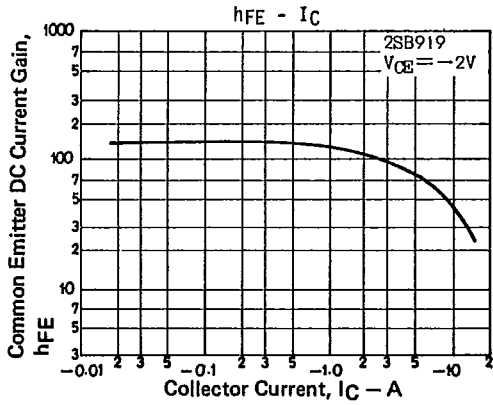
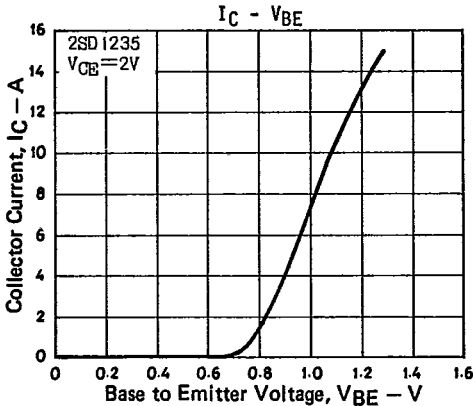
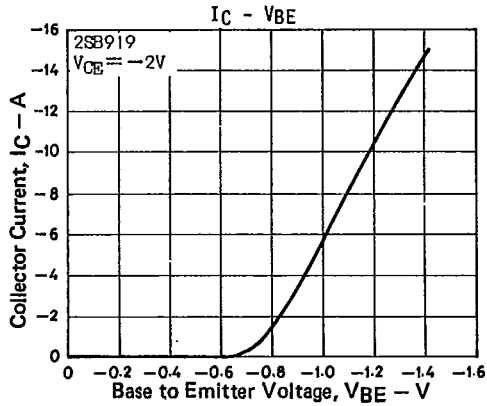
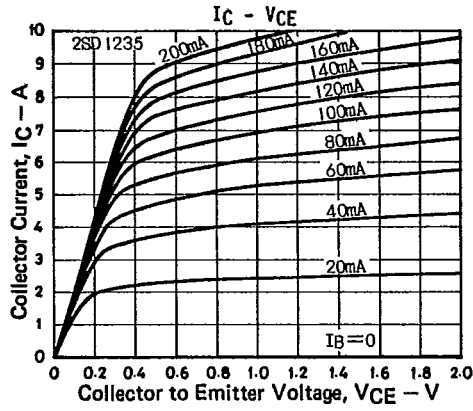
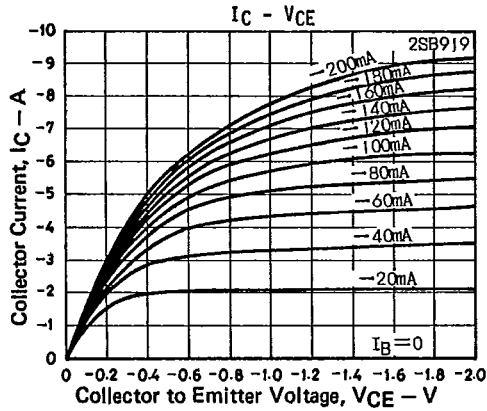


**Case Outline 2010A (unit: mm)**



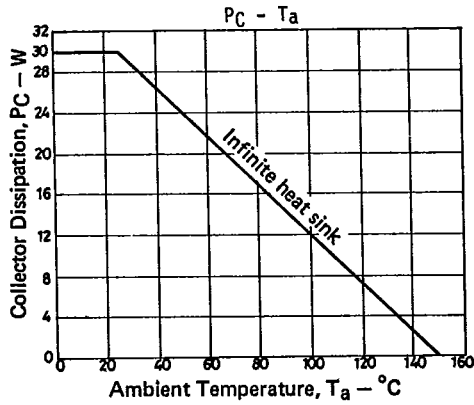
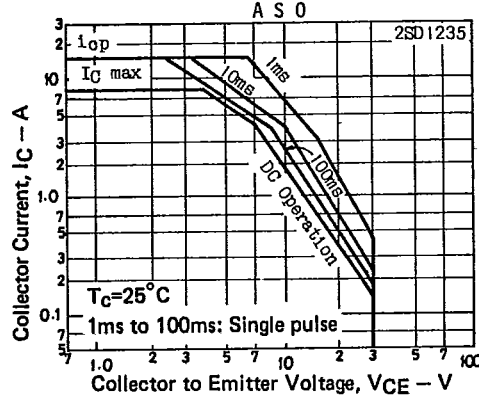
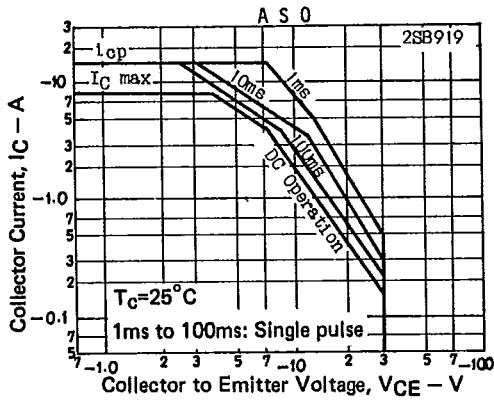
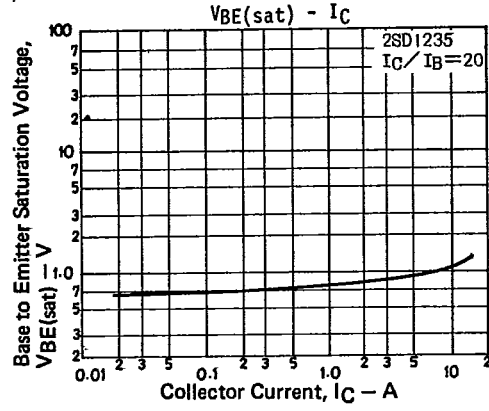
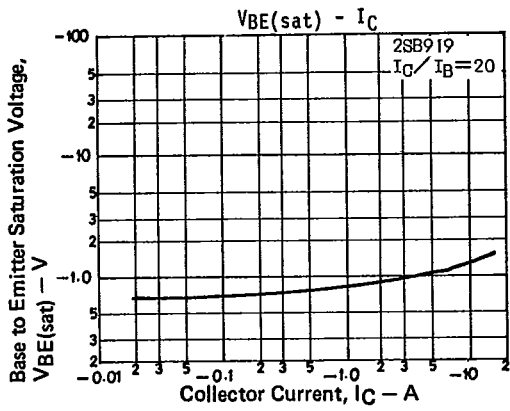
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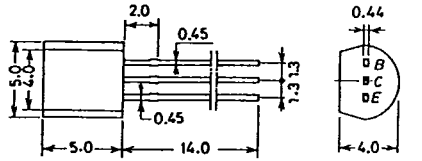
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# CASE OUTLINES AND ATTACHMENTS

- All of Sanyo Transistor case outlines are illustrated below.
- All dimensions are in mm, and dimensions which are not followed by min. or max. are represented by typical values.
- No marking is indicated.

Case Outline-[2003A]

unit:mm

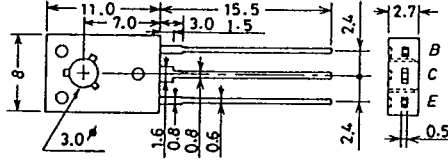


JEDEC: TO-92  
EIAJ: SC-43  
SANYO: NP

B. Base  
C. Collector  
E. Emitter

Case Outline-[2009A]

unit:mm

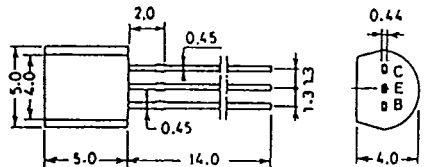


JEDEC: TO-126

B: Base  
C: Collector  
E: Emitter

Case Outline-[2004A]

unit:mm

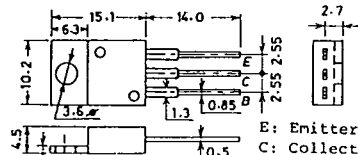


JEDEC: TO-92  
EIAJ: SC-43  
SANYO: NP

C. Collector  
E. Emitter  
B. Base

Case Outline-[2010A]

unit:mm

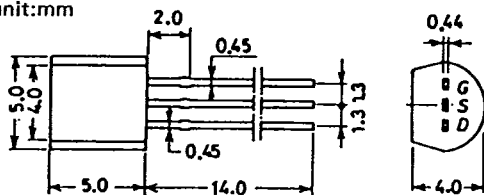


JEDEC: TO-220AB  
EIAJ: SC-46

E: Emitter  
C: Collector  
B: Base

Case Outline-[2005A]

unit:mm

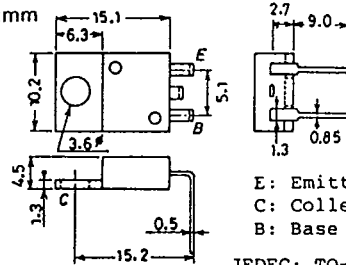


JEDEC: TO-92  
EIAJ: SC-43  
SANYO: NP

G: Gate  
S: Source  
D: Drain  
B: Base  
C: Collector

Case Outline-[2012]

unit:mm

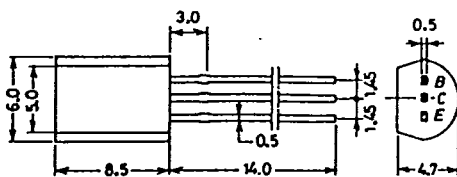


JEDEC: TO-220AA  
EIAJ: SC-45

E: Emitter  
C: Collector  
B: Base

Case Outline-[2006A]

unit:mm

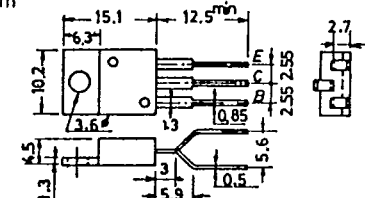


EIAJ: SC-51  
SANYO: MP

B: Base  
C: Collector  
E: Emitter

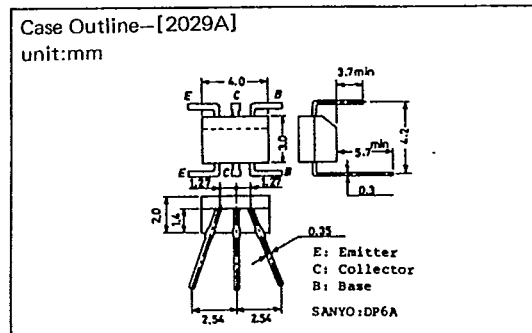
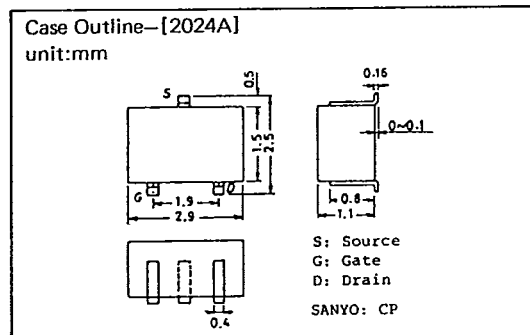
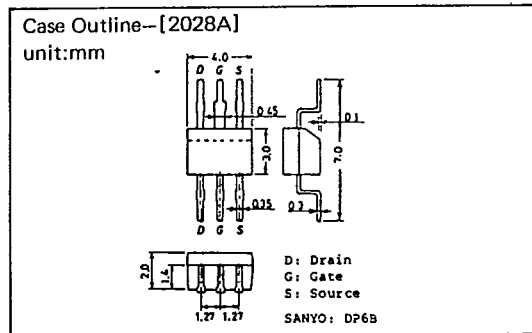
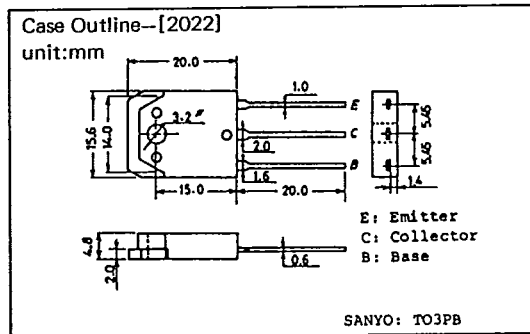
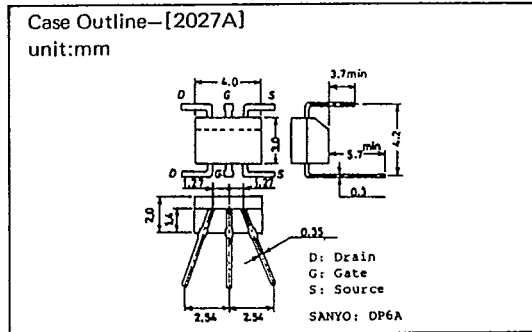
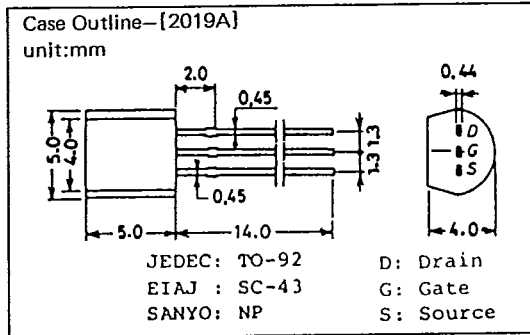
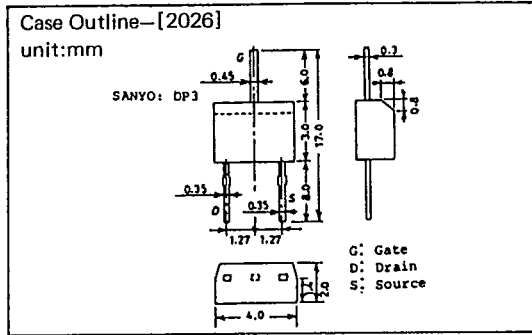
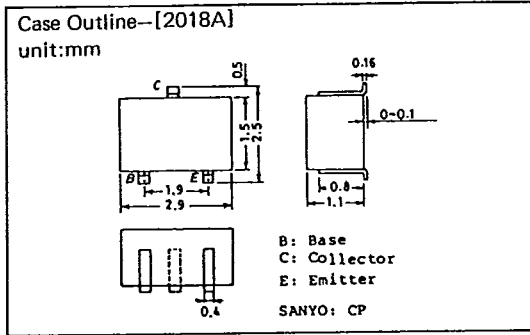
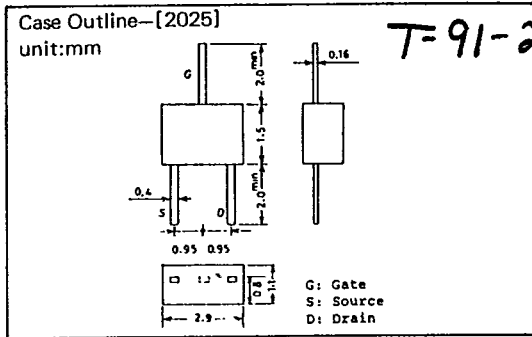
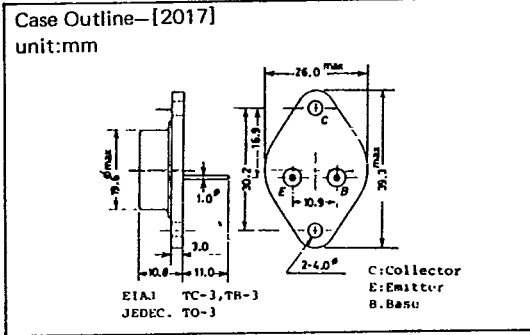
Case Outline-[2013]

unit:mm

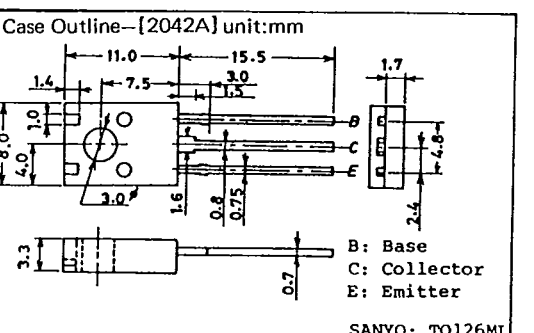
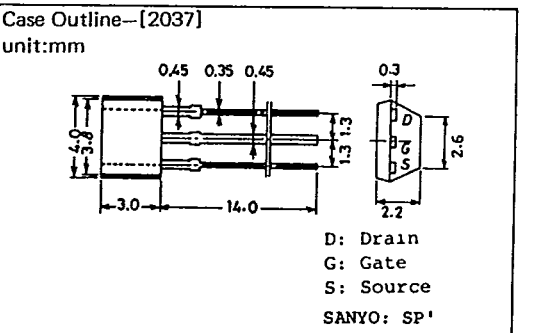
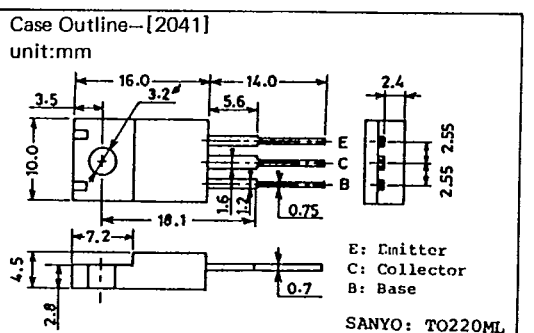
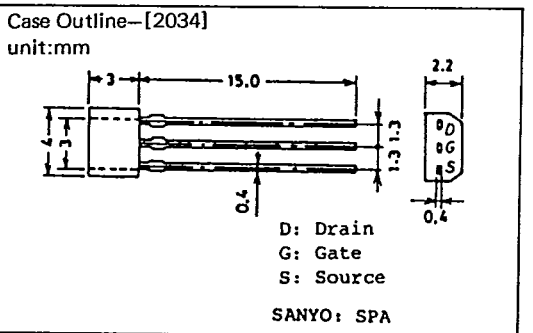
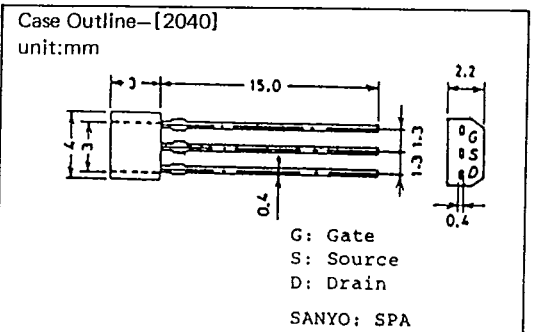
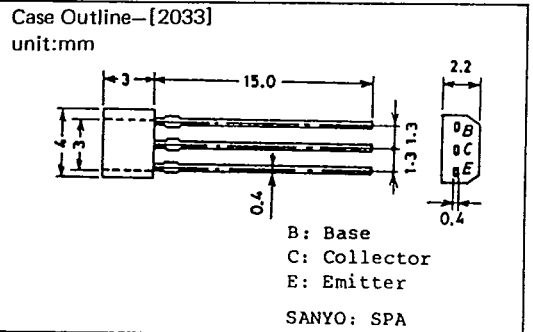
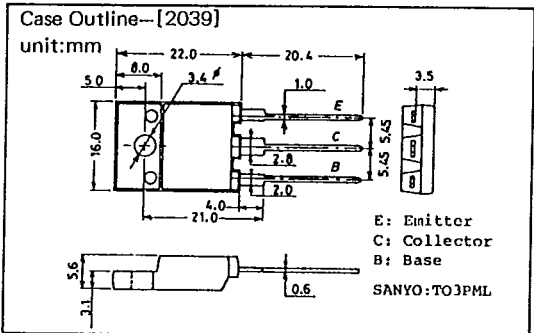
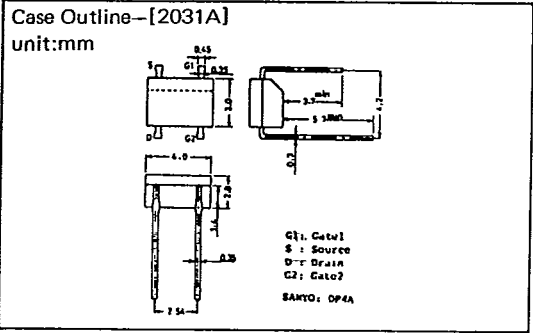
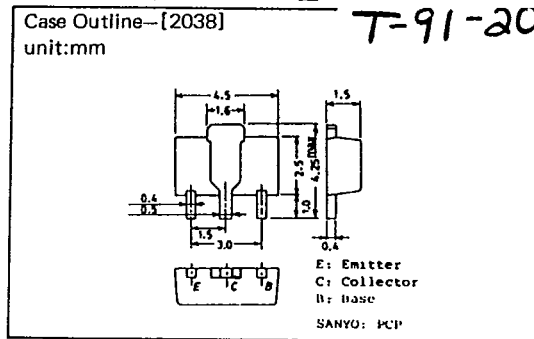
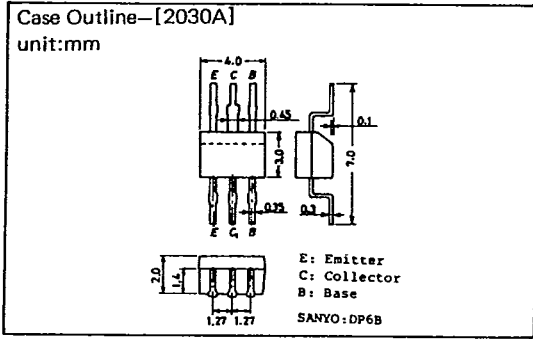


JEDEC TO-220

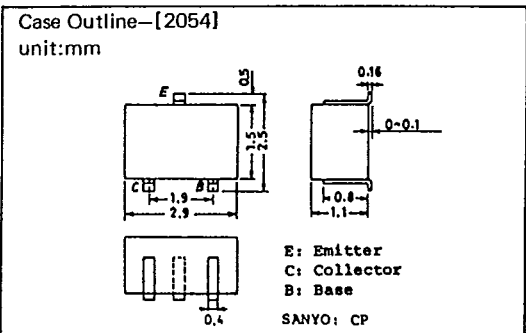
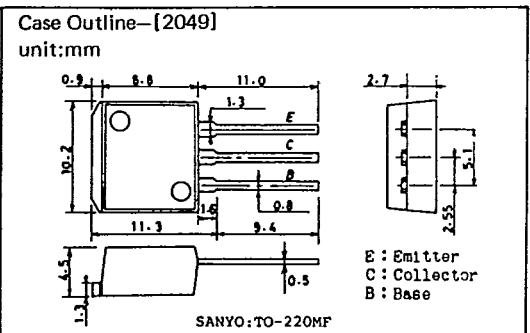
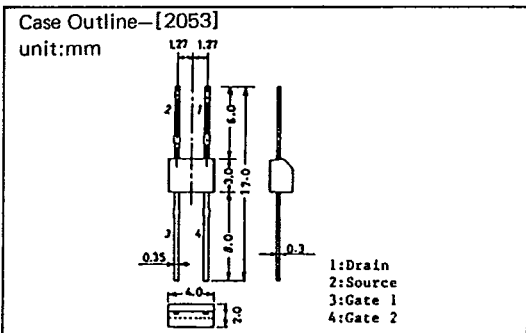
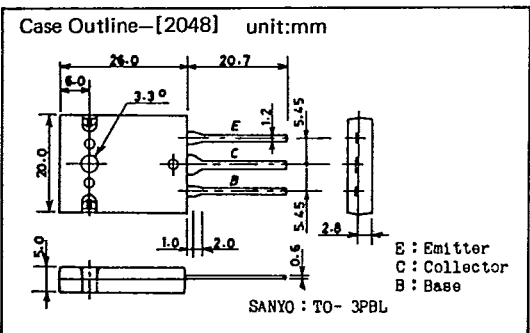
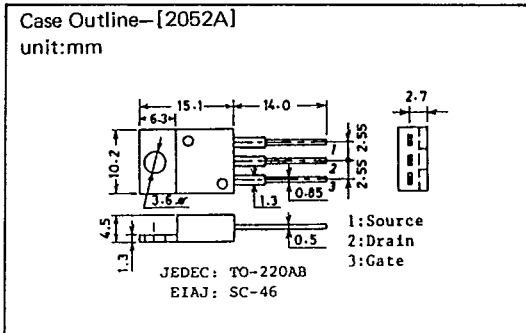
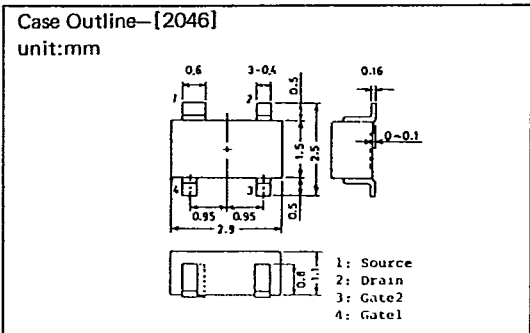
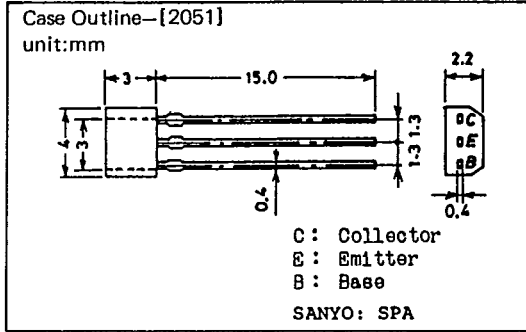
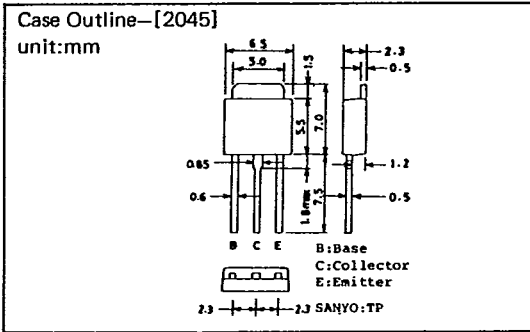
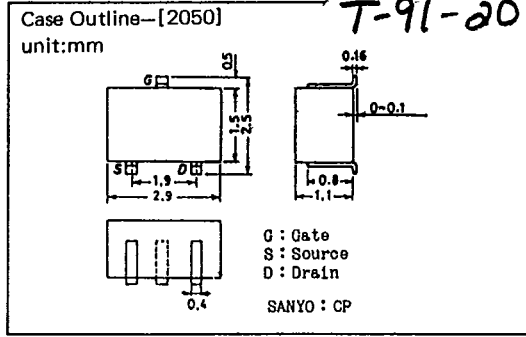
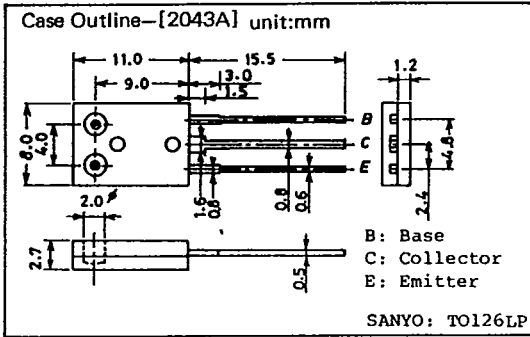
B: Base  
C: Collector  
E: Emitter



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