

# 2SD1649



2039

NPN Triple Diffused Planar Silicon Transistor

T-33-11

## Color TV Horizontal Deflection Output Applications(with Damper Diode)

©1755B

### Applications

- High-voltage, power switching

### Features

- Fast speed ( $t_{max}=0.4\mu s$ ).
- High reliability (Adoption of HVP process).
- High breakdown voltage ( $V_{CBO}=1500V$ ).
- Micaless package facilitating mounting operation.

### Absolute Maximum Ratings at $T_a=25^\circ C$

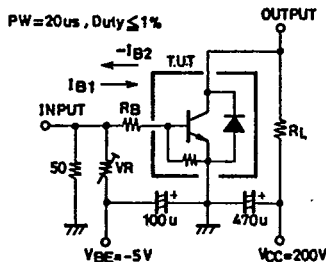
Parameter	Symbol	Value	unit
Collector to Base Voltage	$V_{CBO}$	1500	V
Collector to Emitter Voltage	$V_{CEO}$	800	V
Emitter to Base Voltage	$V_{EBO}$	6	V
Collector Current	$I_C$	2.5	A
Peak Collector Current	$i_{cp}$	10	A
Collector Dissipation	$P_C$	50	W
Junction Temperature	$T_j$	150	$^\circ C$
Storage Temperature	$T_{stg}$	-55 to +150	$^\circ C$

$T_C=25^\circ C$

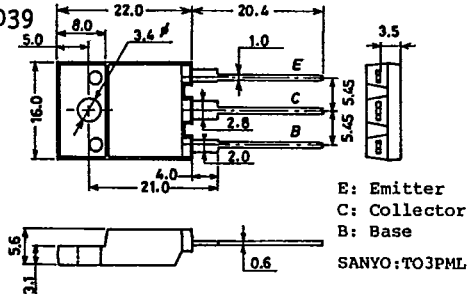
### Electrical Characteristics at $T_a=25^\circ C$

Parameter	Symbol	Test Conditions	min	typ	max	unit
Collector Cutoff Current	$I_{CBO}$	$V_{CB}=800V, I_E=0$			10	$\mu A$
Emitter Cutoff Current	$I_{EBO}$	$V_{EB}=4V, I_C=0$	40		130	mA
DC Current Gain	$h_{FE}$	$V_{CE}=5V, I_C=0.5A$	8			
Gain Bandwidth Product	$f_T$	$V_{CE}=10V, I_C=0.5A$		3		MHz
Collector to Emitter Saturation Voltage	$V_{CE(sat)}$	$I_C=2A, I_B=0.6A$			8	V
Base to Emitter Saturation Voltage	$V_{BE(sat)}$	$I_C=2A, I_B=0.6A$			1.5	V
Collector to Base Breakdown Voltage	$V_{(BR)CBO}$	$I_C=5mA, I_E=0$	1500			V
Collector to Emitter Breakdown Voltage	$V_{(BR)CEO}$	$I_C=100mA, R_{BE}=\infty$	800			V
Emitter to Base Breakdown Voltage	$V_{(BR)EBO}$	$I_E=200mA, I_C=0$	7			V
Diode Forward Voltage	$V_F$	$I_{EC}=2.5A$			2	V
Fall Time	$t_f$	$I_C=2A, I_{B1}=0.6A, I_{B2}=-1.2A, V_{CC}=200V, R_L=100\Omega$			0.4	$\mu s$

### Switching Time Test Circuit

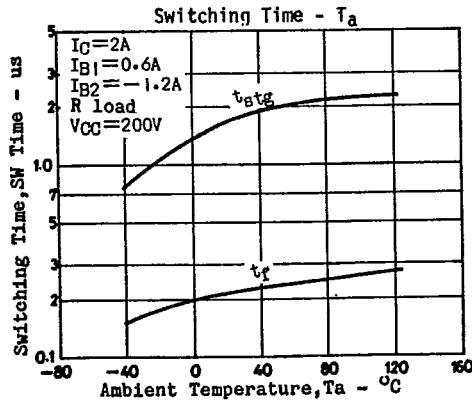
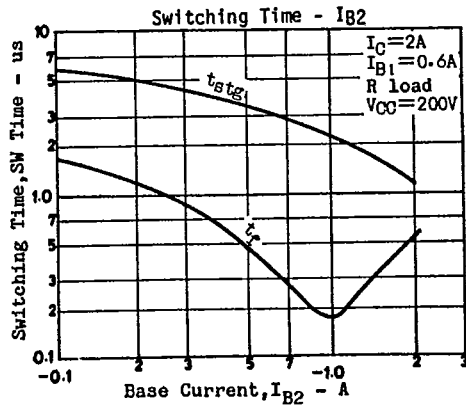
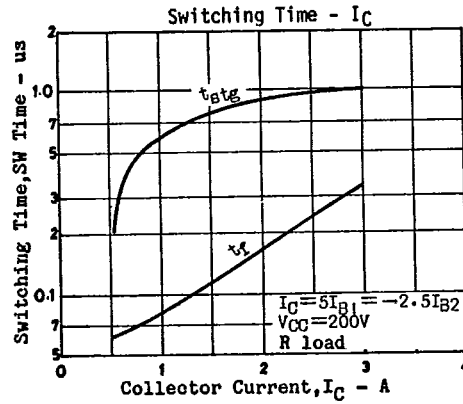
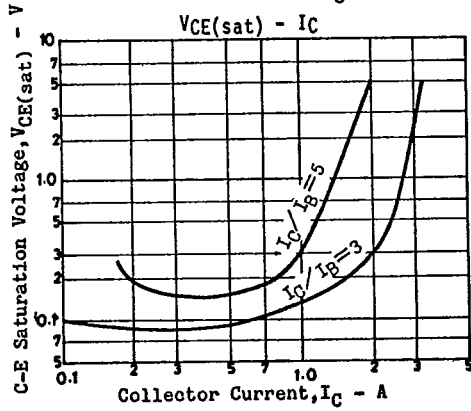
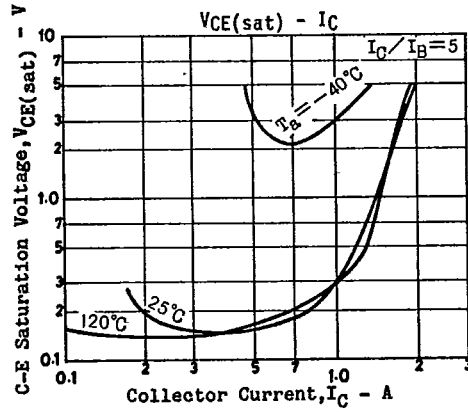
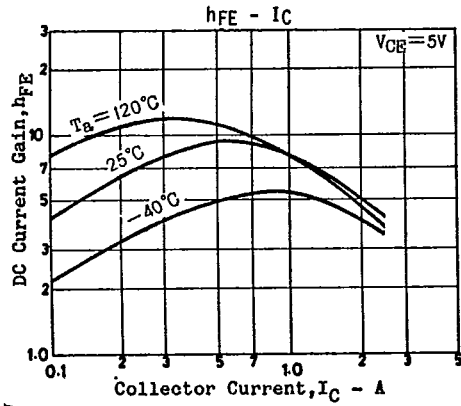
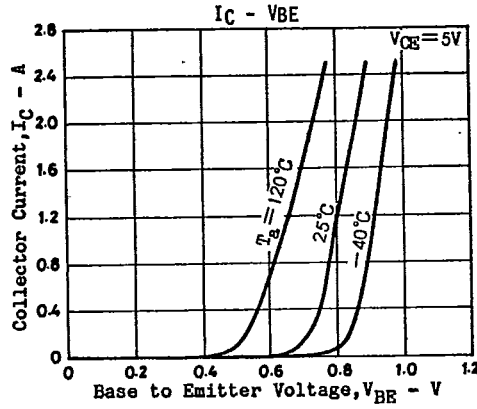
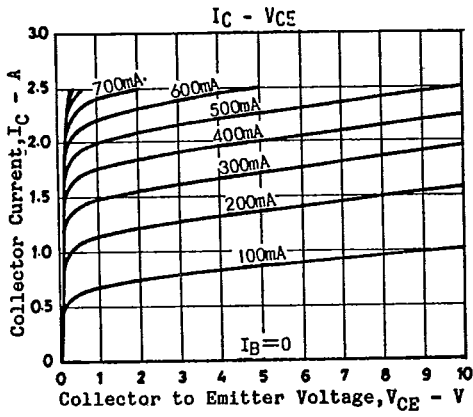


### Case Outline 2039 (unit:mm)



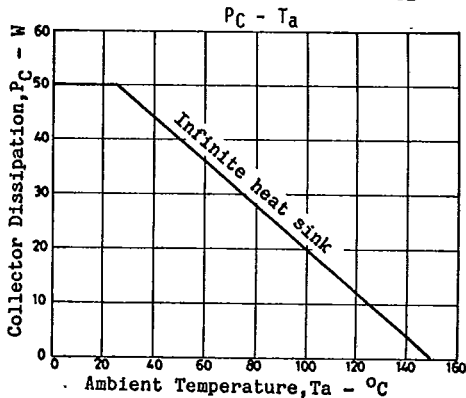
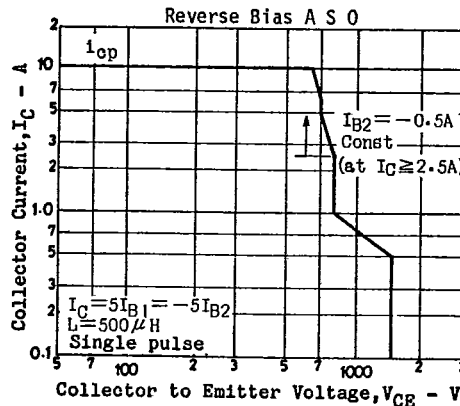
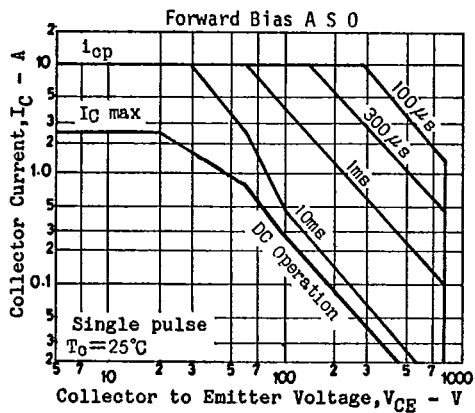
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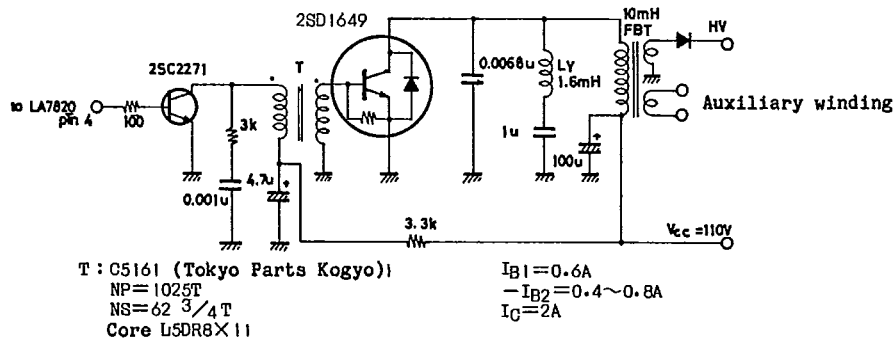


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Sample Application Circuit



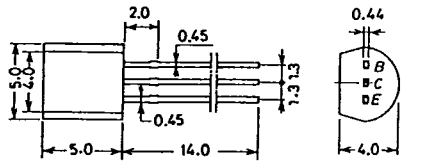
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# CASE OUTLINES AND ATTACHMENTS

- 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

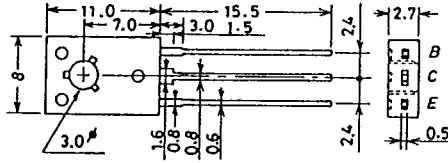


JEDEC: TO-92  
EIAJ: SC-43  
SANYO: NP

B. Base  
C. Collector  
E. Emitter

Case Outline-[2009A]

unit:mm

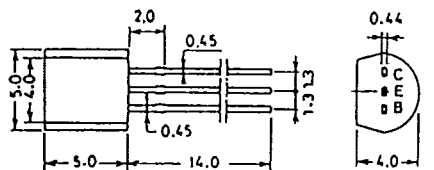


JEDEC: TO-126

B: Base  
C: Collector  
E: Emitter

Case Outline-[2004A]

unit:mm

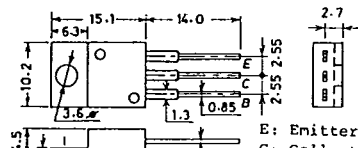


JEDEC: TO-92  
EIAJ: SC-43  
SANYO: NP

C. Collector  
E. Emitter  
B. Base

Case Outline-[2010A]

unit:mm

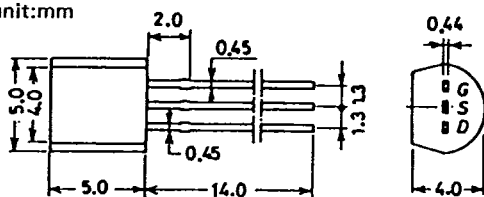


JEDEC: TO-220AB  
EIAJ: SC-46

E: Emitter  
C: Collector  
B: Base

Case Outline-[2005A]

unit:mm

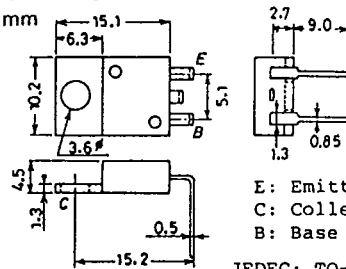


JEDEC: TO-92  
EIAJ: SC-43  
SANYO: NP

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

Case Outline-[2012]

unit:mm

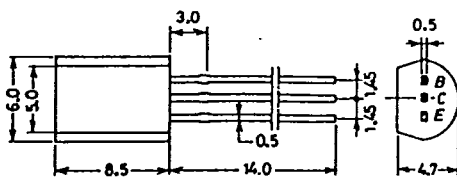


JEDEC: TO-220AA  
EIAJ: SC-45

E: Emitter  
C: Collector  
B: Base

Case Outline-[2006A]

unit:mm

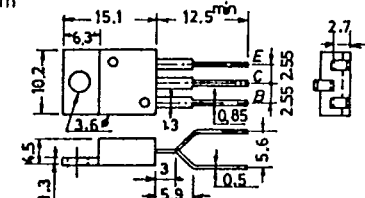


EIAJ: SC-51  
SANYO: MP

B: Base  
C: Collector  
E: Emitter

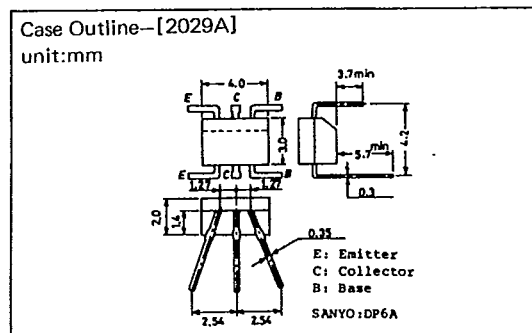
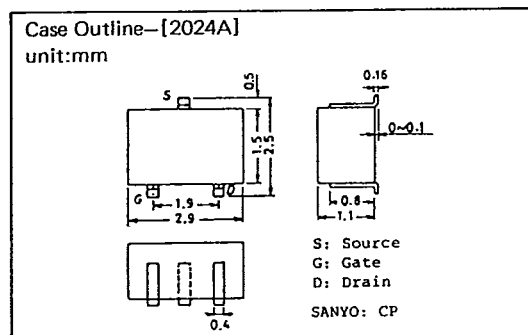
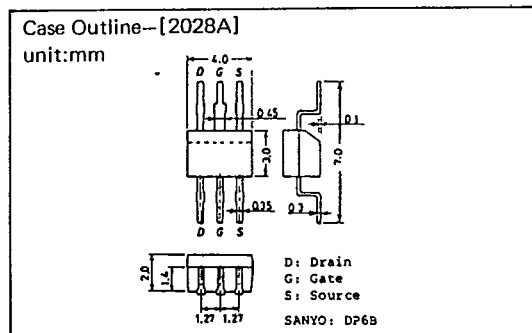
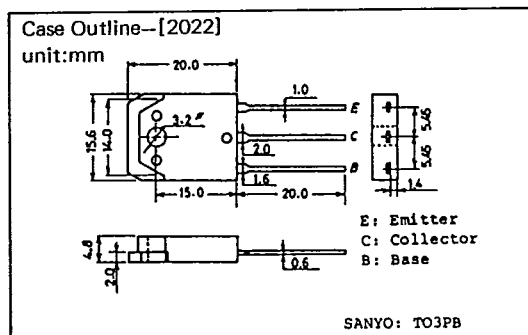
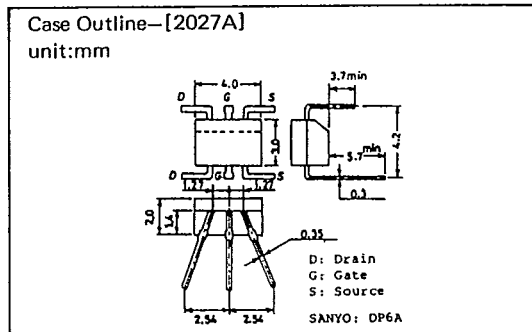
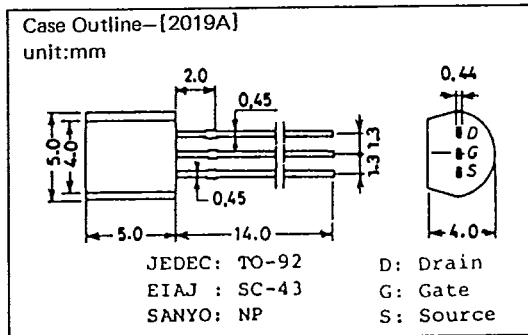
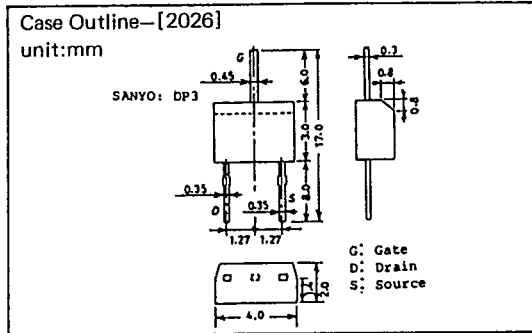
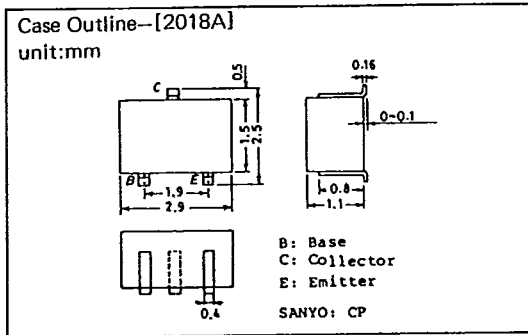
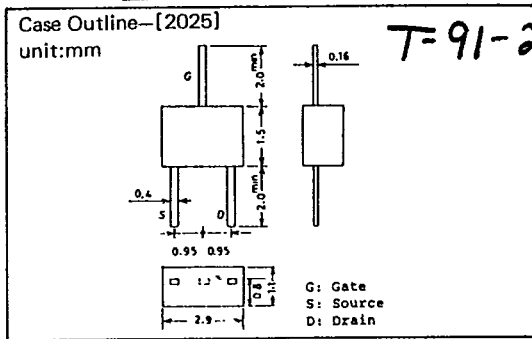
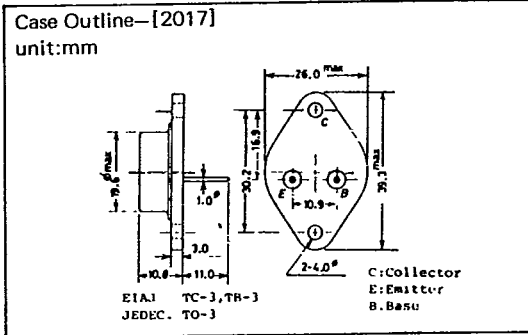
Case Outline-[2013]

unit:mm

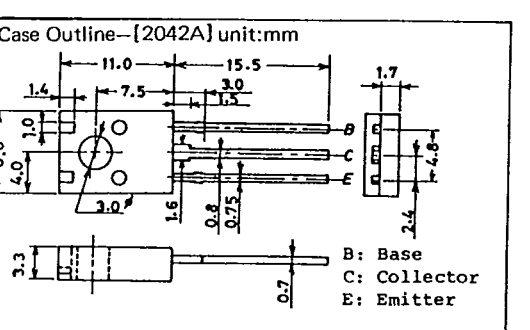
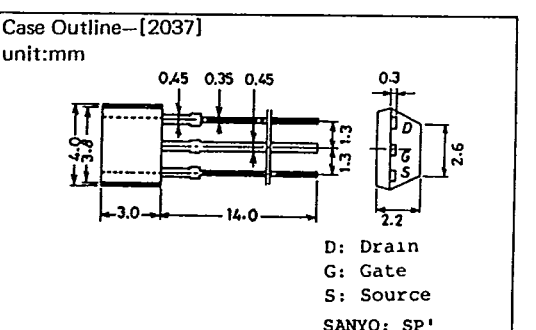
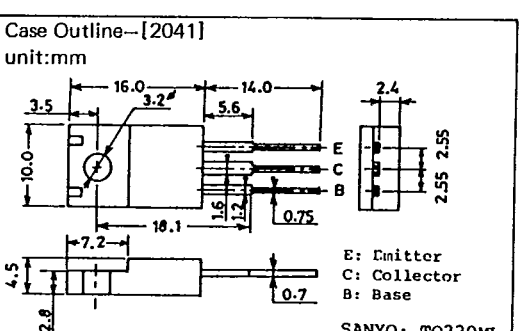
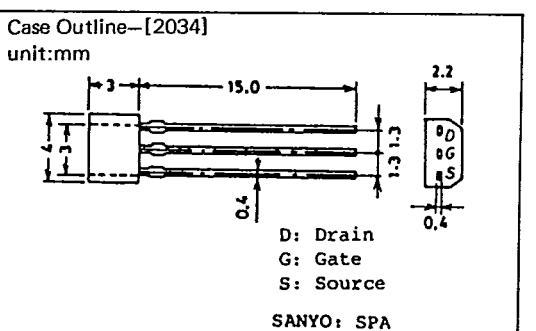
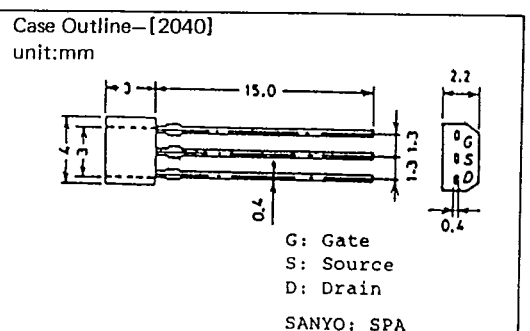
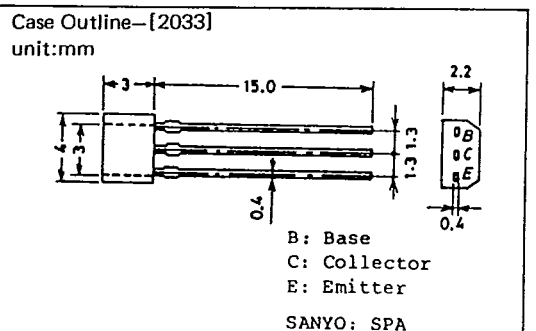
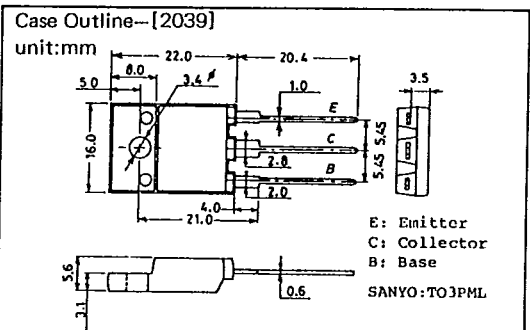
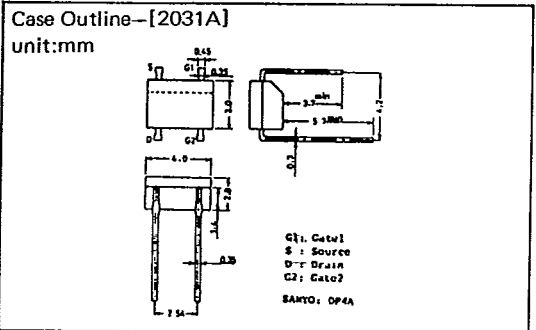
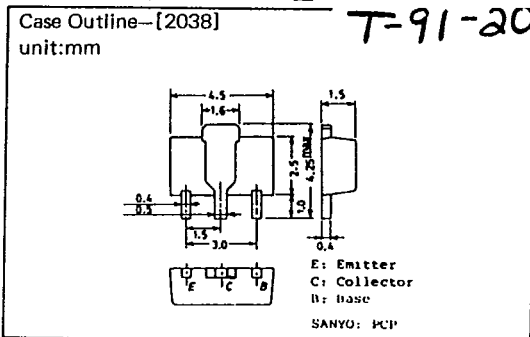
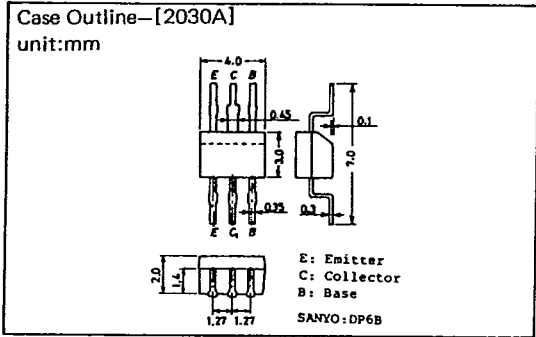


JEDEC TO-220

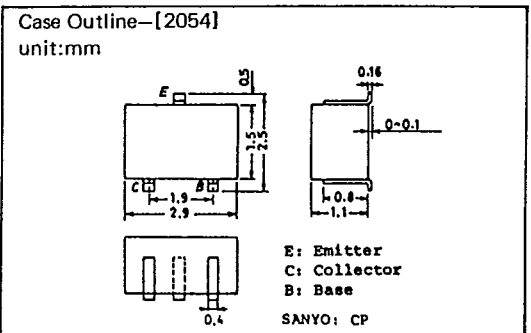
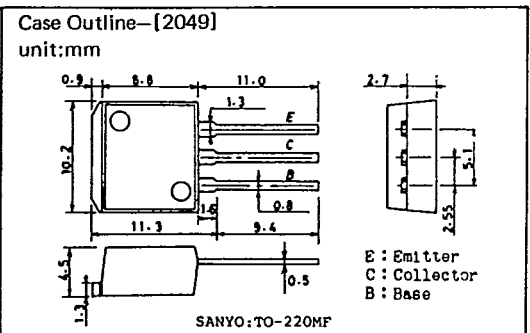
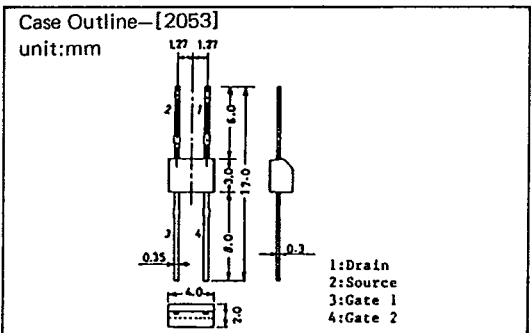
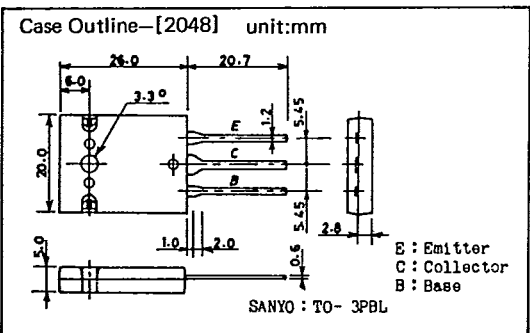
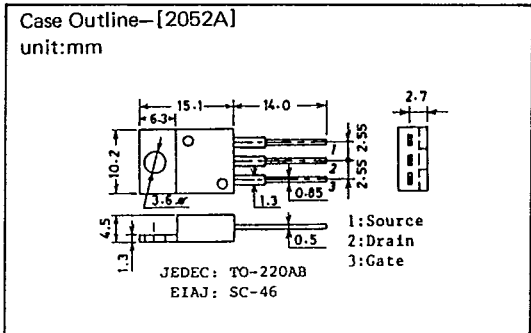
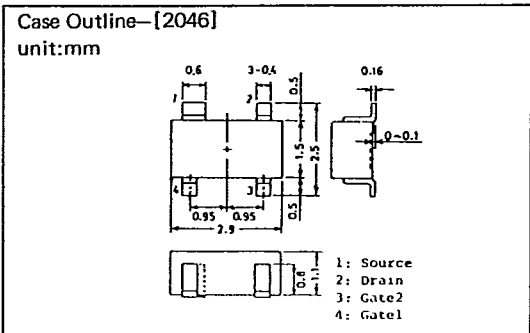
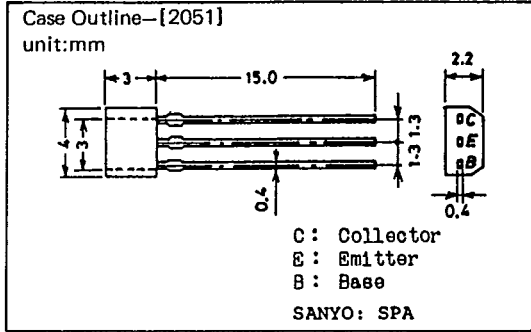
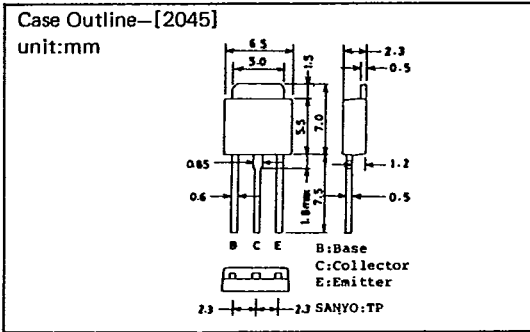
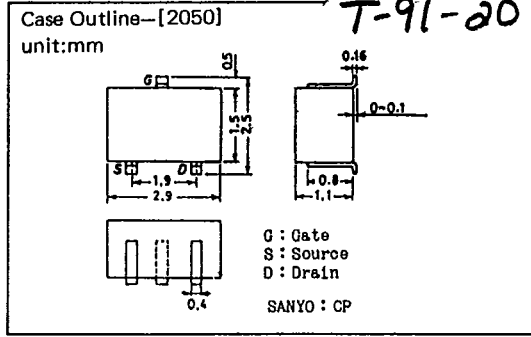
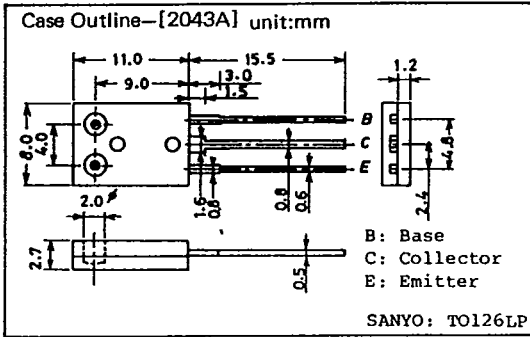
B: Base  
C: Collector  
E: Emitter



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T-91-20



T-91-20

