

## Horizontal Deflection Transistor Series for TV

### ■ Overview

Based on accumulated manufacturing technology, these horizontal deflection transistors for TVs offer high performance and compact design. They can also withstand high voltage and maintain low loss. They also have a broad area of safe-operation, despite an absolutely minimal chip area which allows very compact package configuration. These advanced features contribute to higher performing, more reliable home-use TVs that cost less.

### ■ Features

- Withstands ultrahigh voltage : 1500V/1600V/1700V/1800V/2000V
- Low loss:  $V_{CE(sat)} < 3V$
- Broad area of safe-operation.

### ■ Specifications

Parameter Part No.	Package		Electric Characteristics			Recommended condition	
	Now	Compact packaging	I <sub>c</sub> (A)	V <sub>CB0</sub> (V)	Damper diode	f <sub>H</sub> (kHz)	Screen size (inch)
2SC5657	TOP-3E	Possible	4	1500	Built-in	15.75	to 14
2SC5622/2SC5572	TOP-3E/3D	Possible	6				to 25
2SC5518/2SC5523	TOP-3E/3D	Possible	7				to 29
2SC5514/2SC5521	TOP-3E/3D	Possible	13		Not built-in	32	to 32
2SC5517/2SC5522	TOP-3E/3D	Possible	6	1600/1700	Built-in	15.75	to 29
2SC5519/2SC5524	TOP-3E/3D	Possible	8				to 36
2SC5516/2SC5584	TOP-3E/3L	—	20	1500	Not built-in	32	to 36
2SC5546	TOP-3E	—	18	1700			
2SC5553/2SC5597	TOP-3E/3L	—	22			1700/1800	64
2SC5591/2SC5591A	TOP-3E	—	20				
2SC5686	TOP-3E	—	20	2000			

### ■ Applications

- TVs ●Wide-screen TVs ●Digital TVs

† The products and specifications are subject to change without any notice. Please ask for the latest product standards to guarantee the satisfaction of your product requirements.

Semiconductor Company, Matsushita Electronics Corporation

**2SC5514**

## ■ Absolute Maximum Ratings

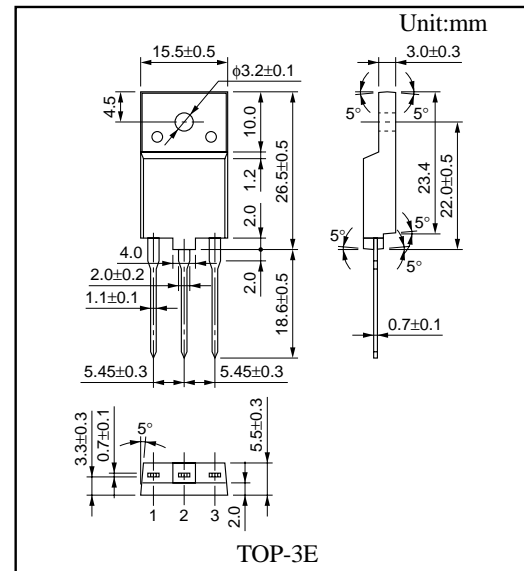
Parameter	Symbol	Rating	Unit
Collector to base voltage	VCBO	1500	V
Collector to emitter voltage	VCES	1500	V
Collector to emitter voltage	VCEO	600	V
Emitter to base voltage	VEBO	7	V
Peak collector current	ICP	23*3	A
Collector current	IC	13	A
Base current	IB	6	A
Collector power dissipation	PC	50*1 3.0*2	W
Junction temperature	Tj	150	°C
Storage temperature	Tstg	-55 to +150	°C

\*1)TC=25°C \*2)Ta=25°C (Without heat sink)

\*3)Non-repetitive peak collector current.

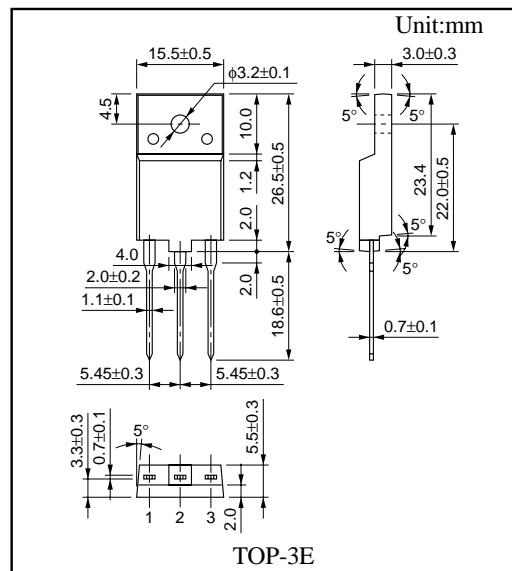
## ■ Electrical Characteristics(TC=25°C)

Parameter	Symbol	Conditions	min	typ	max	Unit
Collector cutoff current	ICBO	VCB=1000V,IE=0	-	-	50	μA
	ICBO	VCB=1500V,IE=0	-	-	1	mA
Emitter cutoff current	IEBO	VEB=7V,IC=0	-	-	50	μA
Forward current transfer ratio	fFE	VCE=5V,IC=6.5A	5	-	9	
Collector to emitter saturation voltage	VCE(sat)	IC=6.5A,IB=1.63A	-	-	3	V
Base to emitter saturation voltage	VBE(sat)	IC=6.5A,IB=1.63A	-	-	1.5	V
Transition frequency	fT	VCE=10V,IC=0.1A,f=0.5MHz	-	3	-	MHz
Fall time	Tf	IC=6.5A,IB1=1.63A,IB2=-3.25A	-	-	0.2	μs
Storage time	Tstg	IC=6.5A,IB1=1.63A,IB2=-3.25A	-	-	2.7	μs



**2SC5516****■ Absolute Maximum Ratings**

Parameter	Symbol	Rating	Unit
Collector to base voltage	VCBO	1500	V
Collector to emitter voltage	VCES	1500	V
Collector to emitter voltage	VCEO	600	V
Emitter to base voltage	VEBO	7	V
Peak collector current	ICP	30 <sup>*3</sup>	A
Collector current	IC	20	A
Base current	IB	8	A
Collector power dissipation	PC	70 <sup>*1</sup> 3.5 <sup>*2</sup>	W
Junction temperature	T <sub>j</sub>	150	°C
Storage temperature	T <sub>stg</sub>	-55 to +150	°C



\*1)TC=25°C \*2)Ta=25°C (Without heat sink)

\*3)Non-repetitive peak collector current.

**■ Electrical Characteristics(TC=25°C)**

Parameter	Symbol	Conditions	min	typ	max	Unit
Collector cutoff current	ICBO	V <sub>CB</sub> =1000V, I <sub>E</sub> =0	-	-	50	μA
	ICBO	V <sub>CB</sub> =1500V, I <sub>E</sub> =0	-	-	1	mA
Emitter cutoff current	IEBO	V <sub>EB</sub> =7V, I <sub>C</sub> =0	-	-	50	μA
Forward current transfer ratio	f <sub>FE</sub>	V <sub>CE</sub> =5V, I <sub>C</sub> =10A	7	-	14	
Collector to emitter saturation voltage	V <sub>CE(sat)</sub>	I <sub>C</sub> =10A, I <sub>B</sub> =2.5A	-	-	3	V
Base to emitter saturation voltage	V <sub>BE(sat)</sub>	I <sub>C</sub> =10A, I <sub>B</sub> =2.5A	-	-	1.5	V
Transition frequency	f <sub>T</sub>	V <sub>CE</sub> =10V, I <sub>C</sub> =0A, f=0.5MHz	-	3	-	MHz
Fall time	T <sub>f</sub>	I <sub>C</sub> =10A, I <sub>B1</sub> =2.5A, I <sub>B2</sub> =-5.0A	-	-	0.2	μs
Storage time	T <sub>stg</sub>	I <sub>C</sub> =10A, I <sub>B1</sub> =2.5A, I <sub>B2</sub> =-5.0A	-	-	2.7	μs



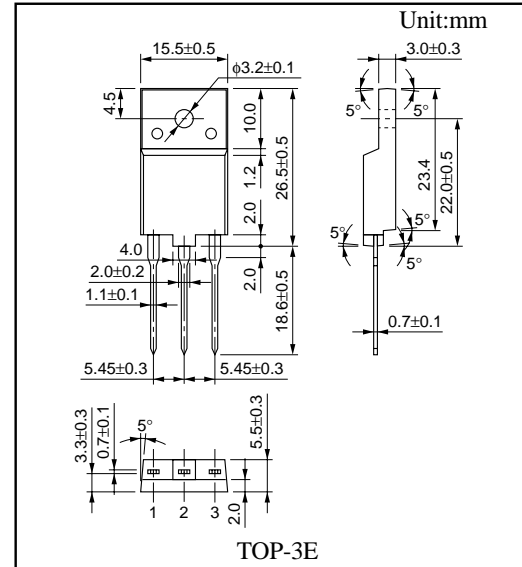




**2SC5572**

## ■ Absolute Maximum Ratings

Parameter	Symbol	Rating	Unit
Collector to base voltage	VCBO	1500	V
Collector to emitter voltage	VCES	1500	V
Emitter to base voltage	VEBO	7	V
Peak collector current	ICP	12 <sup>*3</sup>	A
Collector current	IC	6	A
Base current	IB	3	A
Collector power dissipation	PC	40 <sup>*1</sup> 3 <sup>*2</sup>	W
Junction temperature	T <sub>j</sub>	150	°C
Storage temperature		-55 to +150	°C



\*1)TC=25°C, \*2)Ta=25°C(Without heat sink)

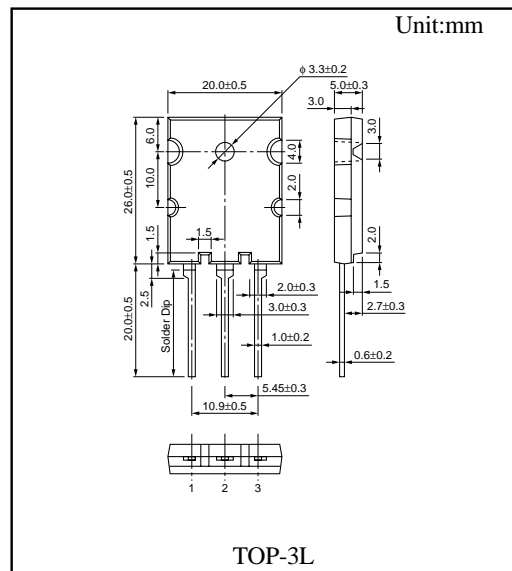
\*3)Non-repetitive peak collector current.

## ■ Electrical Characteristics(TC=25°C)

Parameter	Symbol	Conditions	min	typ	max	Unit
Collector cutoff current	ICBO	V <sub>CB</sub> =1000V, I <sub>E</sub> =0	-	-	50	μA
	ICBO	V <sub>CB</sub> =1500V, I <sub>E</sub> =0	-	-	1	mA
Emitter to base voltage	VEBO	I <sub>E</sub> =500mA, I <sub>C</sub> =0	7	-	-	V
Forward current transfer ratio	f <sub>FE</sub>	V <sub>CE</sub> =5V, I <sub>C</sub> =4A	5	-	9	
Collector to emitter saturation voltage	V <sub>CE(sat)</sub>	I <sub>C</sub> =4A, I <sub>B</sub> =0.8A	-	-	3	V
Base to emitter saturation voltage	V <sub>BE(sat)</sub>	I <sub>C</sub> =4A, I <sub>B</sub> =0.8A	-	-	1.5	V
Transition frequency	f <sub>T</sub>	V <sub>CE</sub> =10V, I <sub>C</sub> =0.1A, f=0.5MHz	-	3	-	MHz
Storage time	T <sub>stg</sub>	I <sub>C</sub> =4A, I <sub>B1</sub> =0.8A, I <sub>B2</sub> =-1.6A	-	-	5.0	μs
Fall time	T <sub>f</sub>	I <sub>C</sub> =4A, I <sub>B1</sub> =0.8A, I <sub>B2</sub> =-1.6A	-	-	0.5	μs
Diode characteristics	V <sub>F</sub>	I <sub>F</sub> =4A	-	-	-2	V

**2SC5584****■ Absolute Maximum Ratings**

Parameter	Symbol	Rating	Unit
Collector to base voltage	VCBO	1500	V
Collector to emitter voltage	VCES	1500	V
Collector to emitter voltage	VCEO	600	V
Emitter to base voltage	VEBO	7	V
Peak collector current	ICP	30 <sup>*3</sup>	A
Collector current	IC	20	A
Base current	IB	8	A
Collector power dissipation	PC	150 <sup>*1</sup> 3.5 <sup>*2</sup>	W
Junction temperature	T <sub>j</sub>	150	°C
Storage temperature	T <sub>stg</sub>	-55 to +150	°C



\*1)TC=25°C \*2)Ta=25°C (Without heat sink)

\*3)Non-repetitive peak collector current.

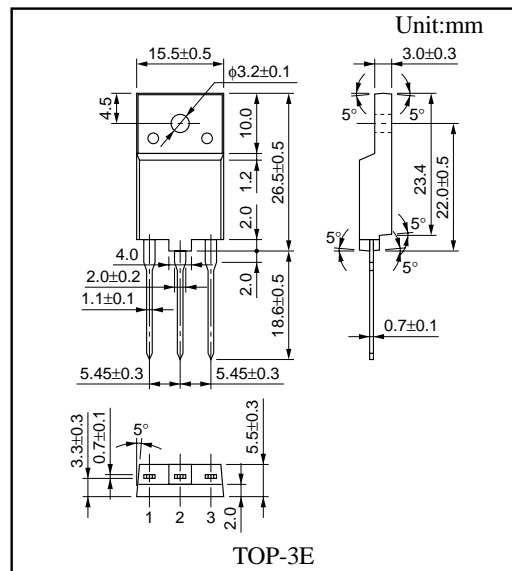
**■ Electrical Characteristics(TC=25°C)**

Parameter	Symbol	Conditions	min	typ	max	Unit
Collector cutoff current	ICBO	V <sub>CB</sub> =1000V, I <sub>E</sub> =0	-	-	50	μA
	ICBO	V <sub>CB</sub> =1500V, I <sub>E</sub> =0	-	-	1	mA
Emitter cutoff current	IEBO	V <sub>EB</sub> =7V, I <sub>C</sub> =0	-	-	50	μA
Forward current transfer ratio	f <sub>FE</sub>	V <sub>CE</sub> =5V, I <sub>C</sub> =10A	7	-	14	
Collector to emitter saturation voltage	V <sub>CE(sat)</sub>	I <sub>C</sub> =10A, I <sub>B</sub> =2.5A	-	-	3	V
Base to emitter saturation voltage	V <sub>BE(sat)</sub>	I <sub>C</sub> =10A, I <sub>B</sub> =2.5A	-	-	1.5	V
Transition frequency	f <sub>T</sub>	V <sub>CE</sub> =10V, I <sub>C</sub> =0.1A, f=0.5MHz	-	3	-	MHz
Fall time	T <sub>f</sub>	I <sub>C</sub> =10A, I <sub>B1</sub> =2.5A, I <sub>B2</sub> =-5.0A	-	-	0.2	μs
Storage time	T <sub>stg</sub>	I <sub>C</sub> =10A, I <sub>B1</sub> =2.5A, I <sub>B2</sub> =-5.0A	-	-	2.7	μs



**2SC5591****■ Absolute Maximum Ratings**

Parameter	Symbol	Rating	Unit
Collector to base voltage	VCBO	1700	V
Collector to emitter voltage	VCES	1700	V
Collector to emitter voltage	VCEO	600	V
Emitter to base voltage	VEBO	7	V
Peak collector current	ICP	30 <sup>*3</sup>	A
Collector current	IC	20	A
Base current	IB	11	A
Collector power dissipation	PC	70 <sup>*1</sup> 3.5 <sup>*2</sup>	W
Junction temperature	T <sub>j</sub>	150	°C
Storage temperature	T <sub>stg</sub>	-55 to +150	°C



\*1)TC=25°C \*2)Ta=25°C (Without heat sink)

\*3)Non-repetitive peak collector current.

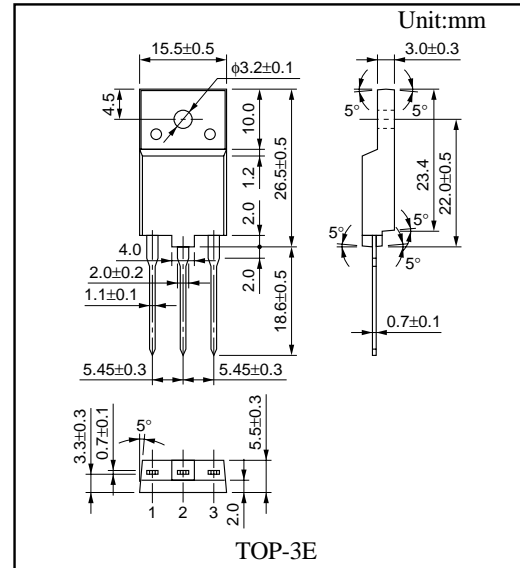
**■ Electrical Characteristics(TC=25°C)**

Parameter	Symbol	Conditions	min	typ	max	Unit
Collector cutoff current	ICBO	V <sub>CB</sub> =1000V, I <sub>E</sub> =0	-	-	50	μA
	ICBO	V <sub>CB</sub> =1700V, I <sub>E</sub> =0	-	-	1	mA
Emitter cutoff current	IEBO	V <sub>EB</sub> =7V, I <sub>C</sub> =0	-	-	50	μA
Forward current transfer ratio	f <sub>FE</sub>	V <sub>CE</sub> =5V, I <sub>C</sub> =10A	7	-	14	
Collector to emitter saturation voltage	V <sub>CE(sat)</sub>	I <sub>C</sub> =10A, I <sub>B</sub> =2.5A	-	-	3	V
Base to emitter saturation voltage	V <sub>BE(sat)</sub>	I <sub>C</sub> =10A, I <sub>B</sub> =2.5A	-	-	1.5	V
Transition frequency	f <sub>T</sub>	V <sub>CE</sub> =10V, I <sub>C</sub> =0.1A, f=0.5MHz	-	3	-	MHz
Fall time	T <sub>f</sub>	I <sub>C</sub> =10A, I <sub>B1</sub> =2.5A, I <sub>B2</sub> =-5.0A	-	-	0.2	μs
Storage time	T <sub>stg</sub>	I <sub>C</sub> =10A, I <sub>B1</sub> =2.5A, I <sub>B2</sub> =-5.0A	-	-	3.0	μs

**2SC5657**

## ■ Absolute Maximum Ratings

Parameter	Symbol	Rating	Unit
Collector to base voltage	VCBO	1500	V
Collector to emitter voltage	VCEs	1500	V
Emitter to base voltage	VEBO	7	V
Peak collector current	ICP	8*3	A
Collector current	IC	4	A
Base current	IB	2	A
Collector power dissipation	PC	40*1 3*2	W
Junction temperature	Tj	150	°C
Storage temperature		-55 to +150	°C



\*1)TC=25°C ,\*2)Ta=25°C(Without heat sink)

\*3)Non-repetitive peak collector current.

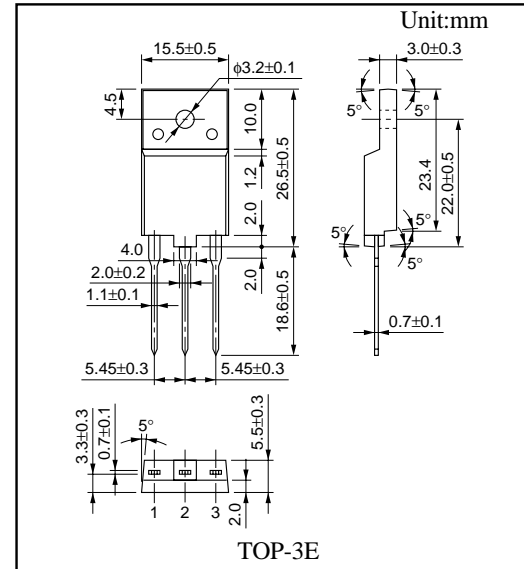
## ■ Electrical Characteristics(TC=25°C)

Parameter	Symbol	Conditions	min	typ	max	Unit
Collector cutoff current	ICBO	V <sub>CB</sub> =1000V,I <sub>E</sub> =0	-	-	50	μA
	ICBO	V <sub>CB</sub> =1500V,I <sub>E</sub> =0	-	-	1	mA
Emitter to base voltage	VEBO	I <sub>E</sub> =500mA,I <sub>C</sub> =0	7	-	-	V
Forward current transfer ratio	f <sub>FE</sub>	V <sub>CE</sub> =5V,I <sub>C</sub> =2A	5	-	9	
Collector to emitter saturation voltage	V <sub>CE(sat)</sub>	I <sub>C</sub> =2A,I <sub>B</sub> =0.5A	-	-	5	V
Base to emitter saturation voltage	V <sub>BE(sat)</sub>	I <sub>C</sub> =2A,I <sub>B</sub> =0.5A	-	-	1.5	V
Transition frequency	f <sub>T</sub>	V <sub>CE</sub> =10V,I <sub>C</sub> =0.1A,f=0.5MHz	-	3	-	MHz
Storage time	T <sub>stg</sub>	I <sub>C</sub> =2A,I <sub>B1</sub> =0.4A,I <sub>B2</sub> =-0.8A	-	-	5.0	μs
Fall time	T <sub>f</sub>	I <sub>C</sub> =2A,I <sub>B1</sub> =0.4A,I <sub>B2</sub> =-0.8A	-	-	0.5	μs
Diode characteristics	V <sub>F</sub>		-	-	-2	V

**2SC5686**

## ■ Absolute Maximum Ratings

Parameter	Symbol	Rating	Unit
Collector to base voltage	VCBO	2000	V
Collector to emitter voltage	VCES	2000	V
Collector to emitter voltage	VCEO	600	V
Emitter to base voltage	VEBO	7	V
Peak collector current	ICP	30 <sup>*3</sup>	A
Collector current	IC	20	A
Base current	IB	11	A
Collector power dissipation	PC	70 <sup>*1</sup> 3.5 <sup>*2</sup>	W
Junction temperature	T <sub>j</sub>	150	°C
Storage temperature	T <sub>stg</sub>	-55 to +150	°C



\*1)T<sub>C</sub>=25°C \*2)T<sub>a</sub>=25°C (Without heat sink)

\*3)Non-repetitive peak collector current.

■ Electrical Characteristics(T<sub>C</sub>=25°C)

Parameter	Symbol	Conditions	min	typ	max	Unit
Collector cutoff current	ICBO	V <sub>CB</sub> =1000V, I <sub>E</sub> =0	-	-	50	μA
	ICBO	V <sub>CB</sub> =2000V, I <sub>E</sub> =0	-	-	1	mA
Emitter cutoff current	IEBO	V <sub>EB</sub> =7V, I <sub>C</sub> =0	-	-	50	μA
Forward current transfer ratio	f <sub>FE</sub>	V <sub>CE</sub> =5V, I <sub>C</sub> =10A	7	-	14	
Collector to emitter saturation voltage	V <sub>CE(sat)</sub>	I <sub>C</sub> =10A, I <sub>B</sub> =2.5A	-	-	3	V
Base to emitter saturation voltage	V <sub>BE(sat)</sub>	I <sub>C</sub> =10A, I <sub>B</sub> =2.5A	-	-	1.5	V
Transition frequency	f <sub>T</sub>	V <sub>CE</sub> =10V, I <sub>C</sub> =0.1A, f=0.5MHz	-	3	-	MHz
Fall time	T <sub>f</sub>	I <sub>C</sub> =10A, I <sub>B1</sub> =2.5A, I <sub>B2</sub> =-5.0A	-	-	0.2	μs
Storage time	T <sub>stg</sub>	I <sub>C</sub> =10A, I <sub>B1</sub> =2.5A, I <sub>B2</sub> =-5.0A	-	-	3.0	μs