

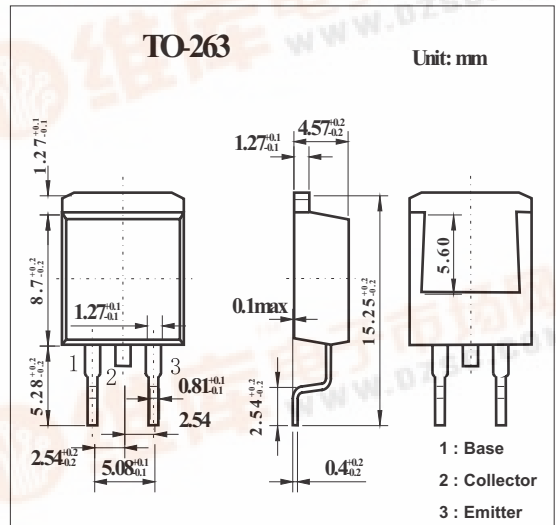
SMD Type Transistors

Switching Applications

2SD2199

■ Features

- Surface mount type device making the following possible.
- Low collector-to-emitter saturation voltage.



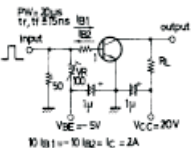
■ Absolute Maximum Ratings Ta = 25°C

Parameter	Symbol	Rating	Unit
Collector-base voltage	V <sub>CB0</sub>	60	V
Collector-emitter voltage	V <sub>CE0</sub>	50	V
Emitter-base voltage	V <sub>EB0</sub>	6	V
Collector current	I <sub>C</sub>	7	A
Collector current (pulse)	I <sub>CP</sub>	12	A
Collector dissipation	P <sub>C</sub>	1.65	W
Jumction temperature	T <sub>J</sub>	150	°C
Storage temperature	T <sub>stg</sub>	-55 to +150	°C



## 2SD2199

## ■ Electrical Characteristics Ta = 25°C

Parameter	Symbol	Testconditions	Min	Typ	Max	Unit	
Collector cutoff current	IcBO	V <sub>CB</sub> = 40V , I <sub>E</sub> = 0			0.1	mA	
Emitter cutoff current	I <sub>EBO</sub>	V <sub>EB</sub> = 4V , I <sub>C</sub> = 0			0.1	mA	
DC current Gain	h <sub>FE</sub>	V <sub>CE</sub> = 2V , I <sub>C</sub> = 1A	70		280		
		V <sub>CE</sub> = 2V , I <sub>C</sub> = 5A	30				
Gain bandwidth product	f <sub>T</sub>	V <sub>CE</sub> = 5V , I <sub>C</sub> = 1A		10		MHz	
Collector-emitter saturation voltage	V <sub>CE(sat)</sub>	I <sub>C</sub> = 4A , I <sub>B</sub> = 0.4A			0.4	V	
Collector-to-base breakdown voltage	V <sub>(BR)CBO</sub>	I <sub>C</sub> = 1mA , I <sub>E</sub> = 0	60			V	
Collector-to-emitter breakdown voltage	V <sub>(BR)CEO</sub>	I <sub>C</sub> = 1mA , R <sub>BE</sub> = ∞	50			V	
Emitter-base breakdown voltage	V <sub>(BR)EBO</sub>	I <sub>E</sub> = 1mA , I <sub>C</sub> = 0	6			V	
Turn-on time	t <sub>on</sub>	 <p> <math>P_{W} = 20\mu s</math>  <math>t_r, t_f = 10ns</math>  <math>I_{B1} = 10\mu A</math>  <math>I_{C1} = 10mA</math>  <math>V_{BE} = 5V</math>  <math>V_{CC} = 20V</math>  <math>R_{B1} = 10k\Omega</math>  <math>R_{C1} = 10k\Omega</math>  <math>I_C = 2A</math>            For PNP, the polarity is reversed.            Unit (resistance : <math>\Omega</math>, capacitance : F)         </p>		0.2		$\mu s$	
Storage time	t <sub>stg</sub>				0.3		$\mu s$
Fall time	t <sub>f</sub>				0.9		$\mu s$

## ■ hFE Classification

Rank	Q	R	S
hFE	70~140	100~200	140~280