2SD2399

Transistor, NPN, Darlington

Features

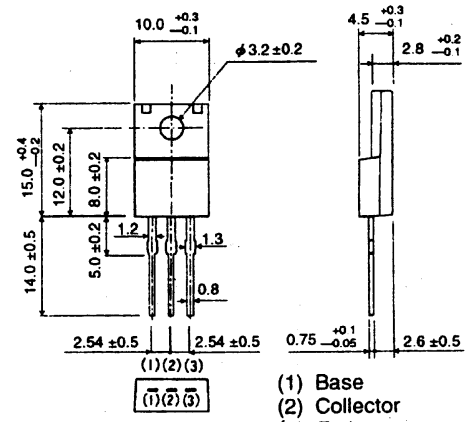
- available in TO-220FN package
- Darlington connection provides high dc current gain (h_{FE})
- damper diode is incorporated
- built-in resistors between base and emitter
- 2 mm lower than the TO-220FP package which allows higher density mounting
- complementary pair with 2SB1568

Applications

- low frequency power amplifier

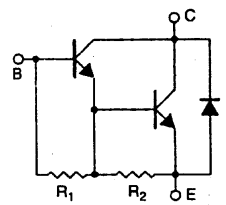
Dimensions (Units : mm)

2SD2399 (TO-220FN)



(1) Base
(2) Collector
(3) Emitter

Equivalent circuit



$R_1 \cong 3.0\ k\Omega$
$R_2 \cong 300\ \Omega$

B: Base
C: Collector
E: Emitter

Absolute maximum ratings (T_a = 25°C)

Parameter	Symbol	Limits	Unit	Conditions
Collector-to-base voltage	V_{CBO}	80	V	
Collector-to-emitter voltage	V_{CEO}	80	V	
Emitter-to-base voltage	V_{EBO}	7	V	
Collector current	I_C	4	A	Continuous (dc)
		6	A	Single pulse, P_W = 100 ms
Collector dissipation	P_C	2	W	
		30	W	T_C = 25°C
Junction temperature	T_j	150	°C	
Storage temperature	T_{stg}	−55 ~ +150	°C	

Electrical characteristics (unless otherwise noted, T_a = 25°C)

Parameter	Symbol	Min	Typical	Max	Unit	Conditions
Collector-to-base breakdown voltage	BV_{CBO}	80			V	I_C = 50 µA
Collector-to-emitter breakdown voltage	BV_{CEO}	80			V	I_C = 1 mA
Collector cutoff current	I_{CBO}			100	µA	V_{CB} = 80 V
Emitter cutoff current	I_{EBO}			3	mA	V_{EB} = 5 V
DC current gain	h_{FE}	1 k		10 k		V_{CE} = 3 V, I_C = 2 A, single pulse
Collector-to-emitter saturation voltage	$V_{CE(sat)}$			1.5	V	I_C/I_B = 2 A/4 mA, single pulse
Transition frequency	f_T		40		MHz	V_{CE} = 5 V, I_E = –0.2 A, f = 10 MHz
Output capacitance	C_{ob}		35		pF	V_{CB} = 10 V, I_E = 0 A, f = 1 MHz

Electrical characteristic curves

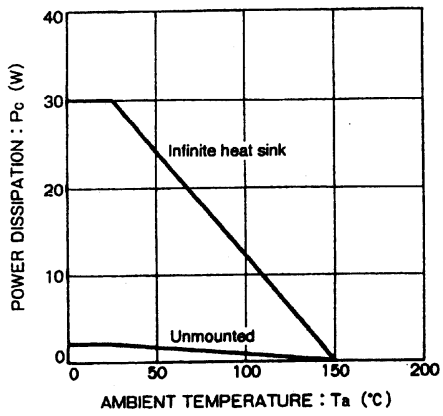


Figure 1

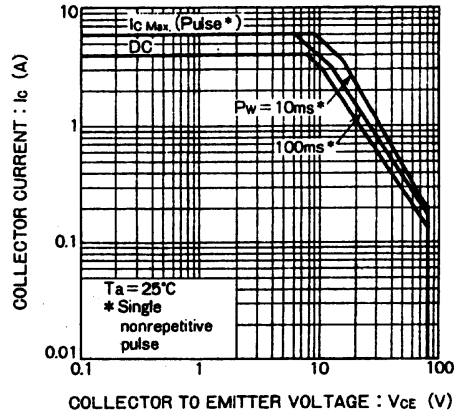


Figure 2

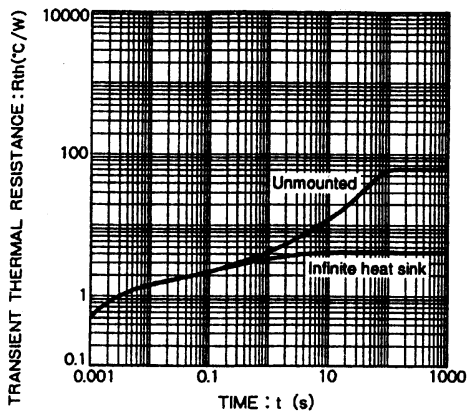


Figure 3

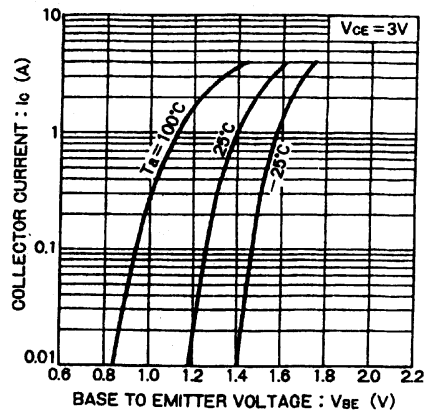


Figure 4

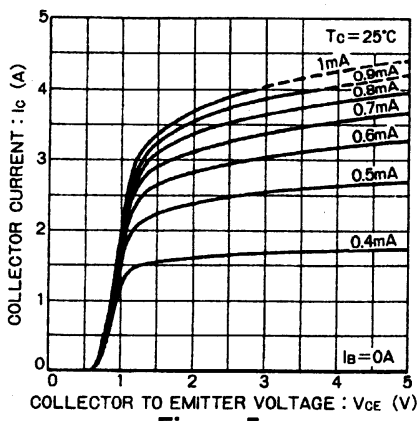


Figure 5

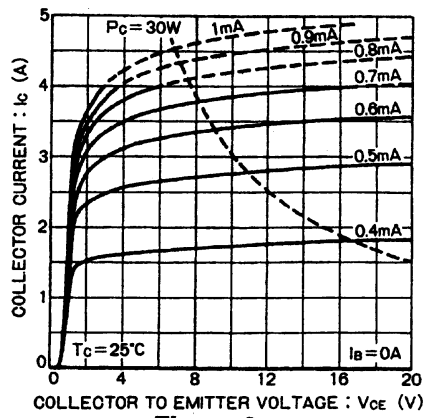


Figure 6

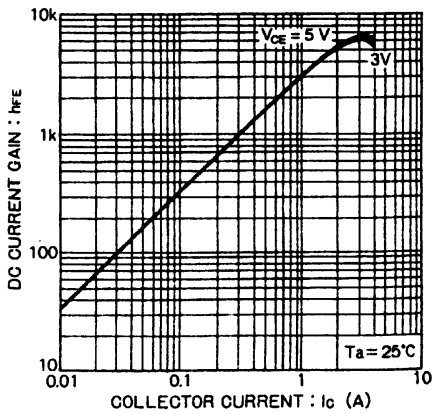


Figure 7

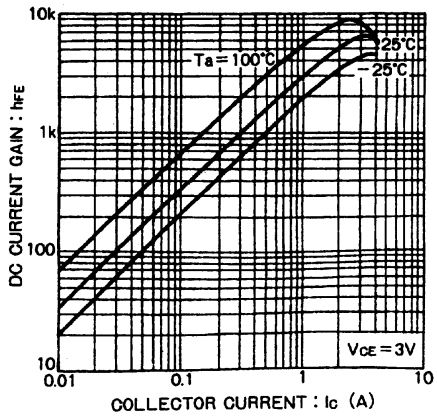


Figure 8

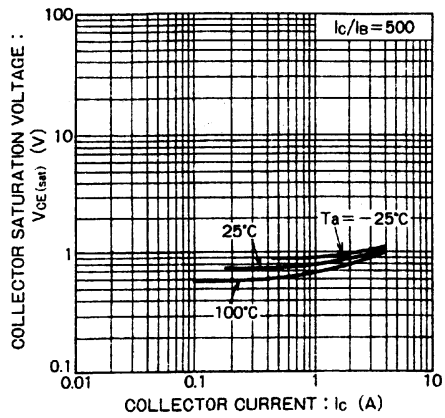


Figure 9

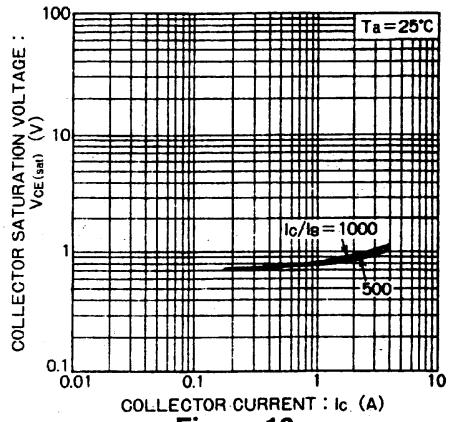


Figure 10

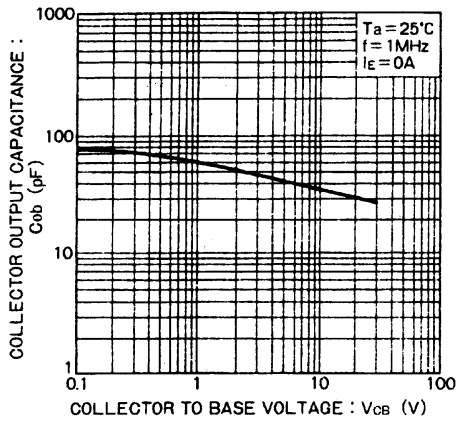


Figure 11

Ordering information

Package	Bulk
Code	
Basic order quantity	500
2SD2399	★
★ = Standard, ☆ = Semi–standard, ✳ = Special order	

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