

Low Frequency Transistor (60V, 3A)

2SD2396

●Features

- 1) Low saturation voltage, typically $V_{CE(sat)} = 0.3V$ at $I_C / I_B = 2A / 50mA$.
- 2) High DC current gain.
(Typically, DC current gain = 1000 at $V_{CE} = 4V, I_C = 0.5A$)
- 3) $P_C = 30W$. ($T_C = 25^\circ C$)
- 4) Wide SOA (safe operating area).

●Packaging specifications and h_{FE}

Type	2SD2396
Package	TO-220FN
h _{FE}	HJK
Code	—
Basic ordering unit (pieces)	500

●Absolute maximum ratings (Ta=25°C)

Parameter	Symbol	Limits	Unit
Collector-base voltage	V _{CBO}	80	V
Collector-emitter voltage	V _{CEO}	60	V
Emitter-base voltage	V _{EBO}	6	V
Collector current	I _C	3	A (DC)
	I _{CP}	6	A (Pulse) *1
Collector power dissipation	P _C	2	W
		30	W (T _C =25°C)
Junction temperature	T _J	150	°C
Storage temperature	T _{stg}	-55~+150	°C

*1 Single pulse P_w=100ms

●Electrical characteristics (Ta=25°C)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Collector-base breakdown voltage	BV _{CBO}	80	—	—	V	I _C =50 μA
Collector-emitter breakdown voltage	BV _{CEO}	60	—	—	V	I _C =1mA
Emitter-base breakdown voltage	BV _{EBO}	6	—	—	V	I _E =50 μA
Collector cutoff current	I _{CBO}	—	—	100	μA	V _{CB} =80V
Emitter cutoff current	I _{EBO}	—	—	100	μA	V _{EB} =6V
DC current transfer ratio	h _{FE}	400	—	2000	—	V _{CE} =4V, I _C =0.5A
Collector-emitter saturation voltage	V _{CE(sat)}	—	0.3	0.8	V	I _C /I _B =2A/0.05A
Base-emitter saturation voltage	V _{BE(sat)}	—	—	1.5	V	I _C /I _B =2A/0.05A
Transition frequency	f _T	—	40	—	MHz	V _{CE} =5V, I _E =-0.2A, f=10MHz
Output capacitance	C _{ob}	—	55	—	pF	V _{CB} =10V, I _E =0A, f=1MHz

* Measured using pulse current.

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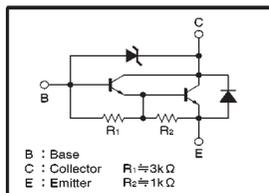
Power Transistor (90±10V, 3A)

2SC5060

●Features

- 1) Built-in zener diode between collector and base.
- 2) Zener diode has low voltage dispersion.
- 3) Strong protection against reverse power surges due to "L" loads.
- 4) Darlington connection for high DC current gain.
- 5) Built-in resistor between base and emitter.
- 6) Built-in damper diode.

●Circuit diagram



●Absolute maximum ratings (Ta=25°C)

Parameter	Symbol	Limits	Unit
Collector-base voltage	V _{CBO}	90±10	V
Collector-emitter voltage	V _{CEO}	90±10	V
Emitter-base voltage	V _{EBO}	6	V
Collector current	I _C	1	A (DC)
	I _{CP}	2	A (Pulse) *1
Collector power dissipation	P _C	1	W *2
Junction temperature	T _J	150	°C
Storage temperature	T _{stg}	-55~+150	°C

*1 Single pulse P_w=10ms

*2 Printed circuit board: 1.7 mm thick, collector copper plating at least 100mm².

●Packaging specifications and h_{FE}

Type	2SC5060
Package	ATV
h _{FE}	M
Code	TV2
Basic ordering unit (pieces)	500

●Electrical characteristics (Ta=25°C)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Collector-base breakdown voltage	BV _{CBO}	80	—	100	V	I _C =50 μA
Collector-emitter breakdown voltage	BV _{CEO}	80	—	100	V	I _C =1mA
Collector cutoff current	I _{CBO}	—	—	10	μA	V _{CB} =70V
Emitter cutoff current	I _{EBO}	—	—	3	mA	V _{EB} =5V
DC current transfer ratio	h _{FE}	1000	—	2500	—	V _{CE} =3V, I _C =0.5A
Collector-emitter saturation voltage	V _{CE(sat)}	—	—	1.5	V	I _C /I _B =500mA/1mA
Base-emitter saturation voltage	V _{BE(sat)}	—	—	2	V	I _C /I _B =500mA/1mA
Transition frequency	f _T	—	80	—	MHz	V _{CB} =5V, I _E =-0.1A, f=30MHz
Output capacitance	C _{ob}	—	20	—	pF	V _{CE} =10V, I _E =0A, f=1MHz
Turn-on time	t _{on}	—	0.2	—	μs	I _C =0.8A, R _L =50Ω
Storage time	t _{stg}	—	5	—	μs	I _B =-I _{ES} =8mA
Fall time	t _f	—	0.6	—	μs	V _{CC} =40V

*1 Measured using pulse current. *2 Transition frequency of the device.

(96-733-D416)

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Datasheets for electronic components.