TOSHIBA Transistor Silicon NPN Epitaxial Type (PCT process)

2SC2713

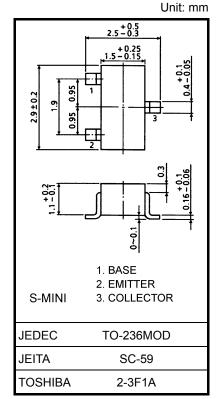
Audio Frequency General Purpose Amplifier Applications

- High voltage: V_{CEO} = 120 V
- Excellent hFE linearity: hFE (IC = 0.1 mA)/hFE (IC = 2 mA) = 0.95 (typ.)
- High h_{FE}: h_{FE} = 200 to 700
- Low noise: NF = 1dB (typ.), 10dB (max)
- Complementary to 2SA1163
- Small package

Absolute Maximum Ratings (Ta = 25°C)

Characteristics	Symbol	Rating	Unit
Collector-base voltage	V _{CBO}	120	V
Collector-emitter voltage	V _{CEO}	120	V
Emitter-base voltage	V _{EBO}	5	V
Collector current	Ι _C	100	mA
Base current	Ι _Β	20	mA
Collector power dissipation	PC	150	mW
Junction temperature	Tj	125	°C
Storage temperature range	T _{stg}	–55 to 125	°C

Note: Using continuously under heavy loads (e.g. the application of high temperature/current/voltage and the significant change in temperature, etc.) may cause this product to decrease in the reliability significantly even if the operating conditions (i.e. operating temperature/current/voltage, etc.) are within the absolute maximum ratings.



Weight: 0.012 g (typ.)

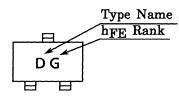
Please design the appropriate reliability upon reviewing the Toshiba Semiconductor Reliability Handbook ("Handling Precautions"/"Derating Concept and Methods") and individual reliability data (i.e. reliability test report and estimated failure rate, etc).

Electrical Characteristics (Ta = 25°C)

Characteristics	Symbol	Test Condition	Min	Тур.	Max	Unit
Collector cut-off current	I _{CBO}	$V_{CB} = 120 \text{ V}, \text{ I}_{E} = 0$	—	—	0.1	μA
Emitter cut-off current	I _{EBO}	$V_{EB}=5~V,~I_C=0$		_	0.1	μA
DC current gain	h _{FE} (Note)	$V_{CE} = 6 V, I_C = 2 mA$	200		700	
Collector-emitter saturation voltage	V _{CE (sat)}	$I_{C} = 10 \text{ mA}, I_{B} = 1 \text{ mA}$	_	_	0.3	V
Transition frequency	f _T	$V_{CE} = 6 V, I_{C} = 1 mA$	_	100		MHz
Collector output capacitance	Cob	$V_{CB}=10~V,~I_{E}=0,~f=1~MHz$		3.0		pF
Noise figure	NF	V_{CE} = 6 V, I _C = 0.1 mA f = 1 kHz, R _G = 10 k Ω		1.0	10	dB

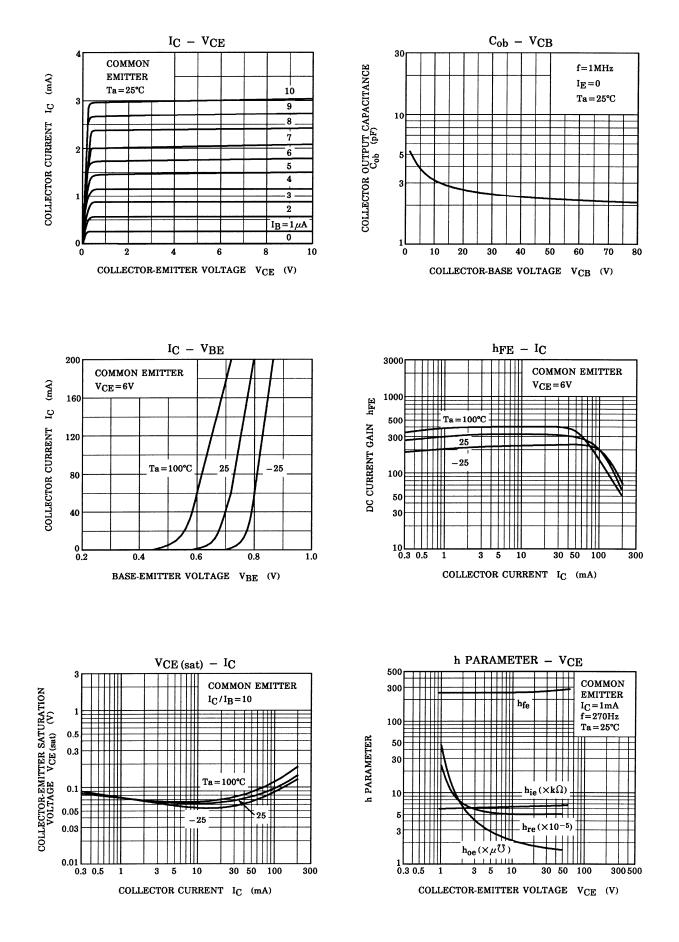
Note: hFE classification GR (G): 200~400, BL (L): 350~700, () marking symbol

Marking

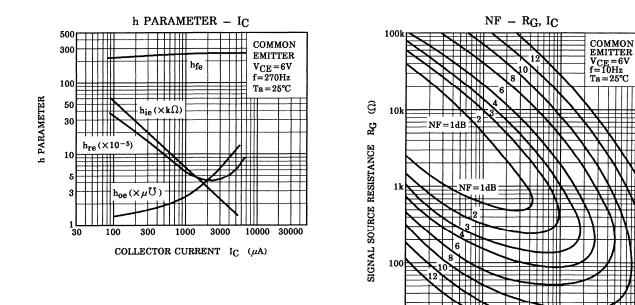


Start of commercial production 1982-10

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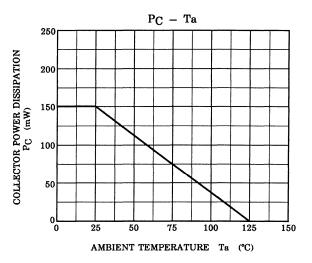


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10L 10

NF - RG, IC100k COMMON EMITTER $V_{CE} = 6V$ f=1kHz Ta = 25°C NF =1dB ĝ 10k ${}^{\rm R}_{\rm G}$ SIGNAL SOURCE RESISTANCE 1k NF=1dB 100 10L 10 100 1000 10000 Collector current I_C (μA)



COLLECTOR CURRENT I_C (μA)

1000

10000

100

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