NEC

COMPOUND TRANSISTOR
CE1F3P

on-chip resistor NPN silicon epitaxial transistor
For mid-speed switching

The CE1F3P is a transistor of on-chip high hFE resistor incorporating dumper diode in collector to emitter and zener diode in collector to base as protect elements. This transistor is ideal for actuator drives of OA equipments and electric equipments.

FEATURES

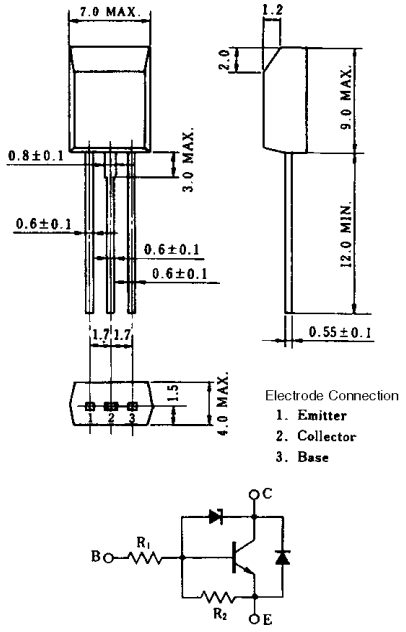
- On-chip zener diode for surge voltage absorption
- On-chip bias resistor: R1 = 2.2 kΩ, R2 = 10 kΩ
- Low power consumption during driving:
  V_{OL} = 0.12 V @V_I = 5.0 V, I_C = 0.5 A
- On-chip dumper diode for reverse cable

ABSOLUTE MAXIMUM RATINGS (Ta = 25°C)

Parameter	Symbol	Ratings	Unit
Collector to base voltage	V_{CBO}	60±10	V
Collector to emitter voltage	V_{CEO}	60±10	V
Emitter to base voltage	V_{EBO}	15	V
Collector current (DC)	$I_{C(DC)}$	±2.0	A
Collector current (Pulse)	$I_{C(pulse)}$ *	±3.0	A
Base current (DC)	$I_{B(DC)}$	0.03	A
Total power dissipation	P_T	1.0	W
Junction temperature	T_j	150	°C
Storage temperature	T_{stg}	−55 to +150	°C

* PW≤10 ms, duty cycle≤50 %

PACKAGE DRAWING (UNIT: mm)



ELECTRICAL CHARACTERISTICS (Ta = 25°C)

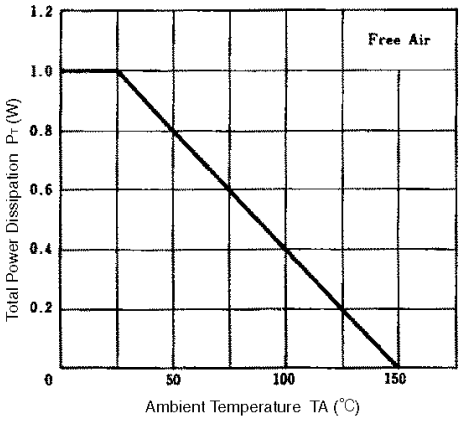
Parameter	Symbol	Conditions	MIN.	TYP.	MAX.	Unit
Colletor to emitter voltage	$V_{CEO(SUS)}$	I_C = 2.0 A, I_B = 5.0 Ma, L = 6.0 mH	50	60		V
Collector cutoff current	I_{CBO}	V_{CB} = 40 V, I_E = 0			100	nA
DC current gain	h_{FE1} **	V_{CE} = 5.0 V, I_C = 0.2 A	700	1200		–
DC current gain	h_{FE2} **	V_{CE} = 5.0 V, I_C = 1.0 A	1000	1600	3000	–
DC current gain	h_{FE3} **	V_{CE} = 5.0 V, I_C = 2.0 A	500	1200		–
Low level output voltage	V_{OL} **	V_I = 5.0 V, I_C = 0.5 A		0.12	0.3	V
Low level input voltage	V_{IL} **	V_{CE} = 12 V, I_C = 100 μA		0.5	0.4	V
Input resistance 1	R_1		1.54	2.2	2.86	kΩ
Input resistance 2	R_2		7.0	10.0	13.0	kΩ
Turn-on time	t_{on}	I_C = 1.0 A		0.4		μs
Storage time	t_{stg}	I_{BI} = −I_{B2} = 10 mA		1.4		μs
Fall time	t_f	V_{CC} = 20 V, R_L = 20 Ω		0.5		μs

** Pulse test PW ≤ 350 μs, duty cycle ≤ 2 %

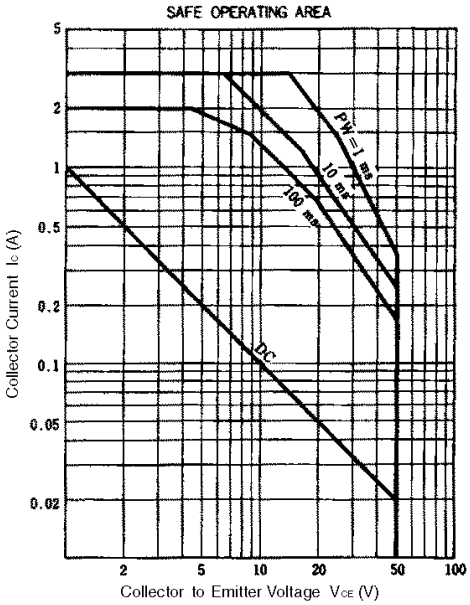
Document No. D16178EJ1V0DS00
Date Published April 2002 N CP(K)
Printed in Japan

TYPICAL CHARACTERISTICS (T_a = 25°C)

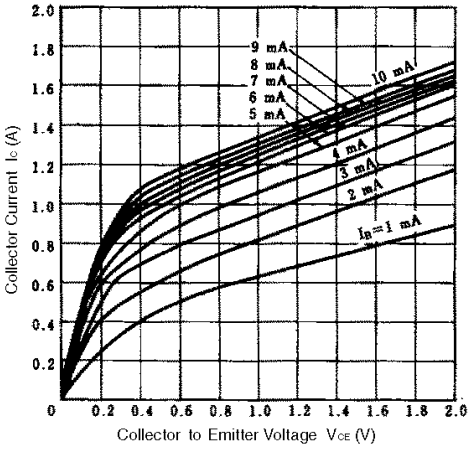
TOTAL POWER DISSIPATION vs. AMBIENT TEMPERATURE



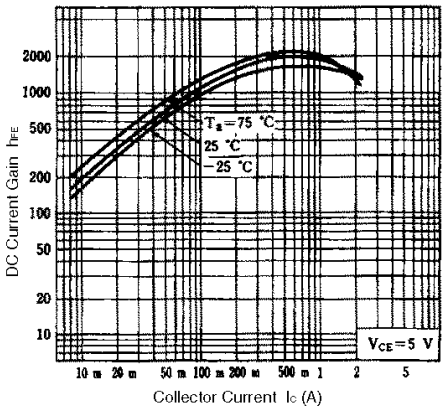
SAFE OPERATING AREA



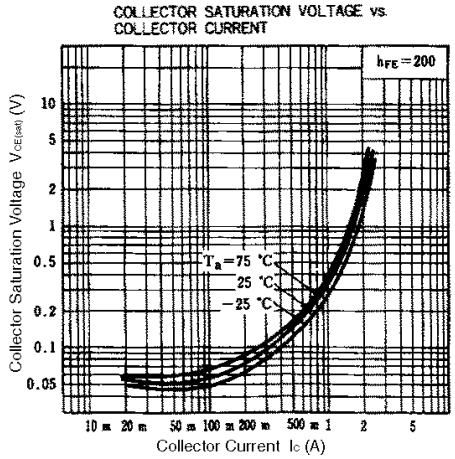
COLLECTOR CURRENT vs. COLLECTOR TO EMITTER VOLTAGE



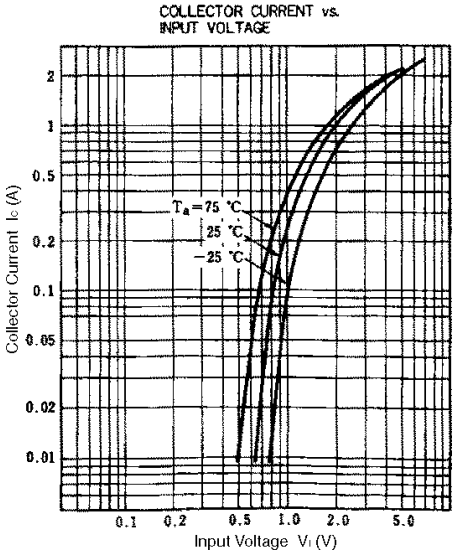
DC CURRENT GAIN vs. COLLECTOR CURRENT



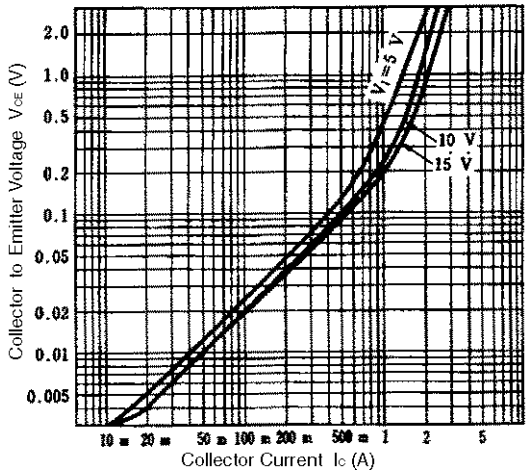
COLLECTOR SATURATION VOLTAGE vs. COLLECTOR CURRENT



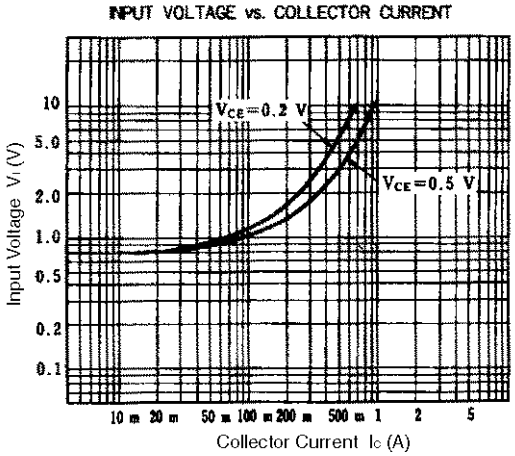
COLLECTOR CURRENT vs. INPUT VOLTAGE



COLLECTOR TO EMITTER VOLTAGE vs.
COLLECTOR CURRENT



INPUT VOLTAGE vs. COLLECTOR CURRENT



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