NEC

SILICON POWER TRANSISTOR
2SC4342

NPN SILICON EPITAXIAL TRANSISTOR (DARLINGTON CONNECTION) FOR HIGH-SPEED SWITCHING

DESCRIPTION

The 2SC4342 is a high-speed Darlington power transistor.

This transistor is ideal for high-precision control such as PWM control for pulse motors or blushless of OA and FA equipment.

ORDERING INFORMATION

PART NUMBER	PACKAGE
2SC4342	TO-126 (MP-5)

FEATURES

- On-chip C-to-E reverse diode
- Fast switching speed

ABSOLUTE MAXIMUM RATINGS (T_A = 25°C)

Collector to Base Voltage	V_{CBO}	150	V
Collector to Emitter Voltage	V_{CEO}	100	V
Emitter to Base Voltage	V_{EBO}	8.0	V
Collector Current (DC)	$I_{C(DC)}$	±3.0	A
Collector Current (pulse)	$I_{C(pulse)}$ **Note**	±5.0	A
Base Current (DC)	$I_{B(DC)}$	0.3	A
Total Power Dissipation (T_A = 25°C)	P_{T1}	1.3	W
Total Power Dissipation (T_C = 25°C)	P_{T2}	12	W
Junction Temperature	T_j	150	°C
Storage Temperature	T_{stg}	–55 to +150	°C

Note PW ≤ 10 ms, Duty Cycle ≤ 50%

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The mark ★ shows major revised points.

ELECTRICAL CHARACTERISTICS (T_A = 25°C)

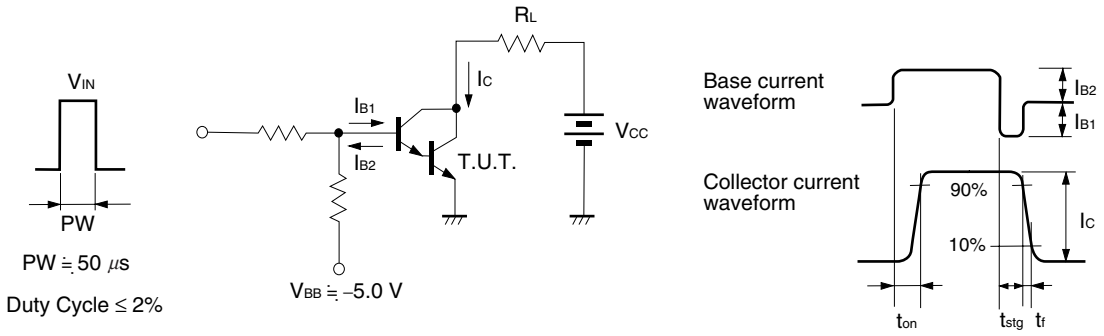
CHARACTERISTICS	SYMBOL	TEST CONDITIONS	MIN.	TYP.	MAX.	UNIT
Collector Cut-off Current	I_{CBO}	V_{CB} = 100 V, I_E = 0 A			1.0	μA
Emitter Cut-off Current	I_{EBO}	V_{EB} = 5.0 V, I_C = 0 A			5.0	mA
DC Current Gain **Note**	h_{FE1}	V_{CE} = 2.0 V, I_C = 1.5 A	2000		20000	
	h_{FE2}	V_{CE} = 2.0 V, I_C = 3.0 A	1000			
Collector Saturation Voltage **Note**	$V_{CE(sat)}$	I_C = 1.5 A, I_B = 1.5 mA			1.5	V
Base Saturation Voltage **Note**	$V_{BE(sat)}$	I_C = 1.5 A, I_B = 1.5 mA			2.0	V
Turn-on Time	t_{on}	I_C = 1.5 A, R_L = 33 Ω		0.3		μs
Storage Time	t_{stg}	I_{B1} = $-I_{B2}$ = 3.0 mA, V_{CC} ≒ 50 V		1.5		μs
Fall Time	t_f	Refer fo the switching time (t_{on}, t_{stg}, t_f) test circuit		0.4		μs

Note Pulsed test PW ≤ 350 μs, Duty Cycle ≤ 2%

★ h_{FE} CLASSIFICATION

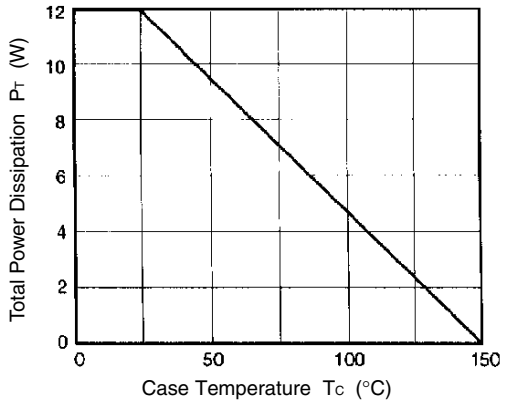
Marking	M	L	K
h_{FE1}	2000 to 5000	4000 to 10000	8000 to 20000

SWITCHING TIME (t_{on}, t_{stg}, t_f) TEST CIRCUIT

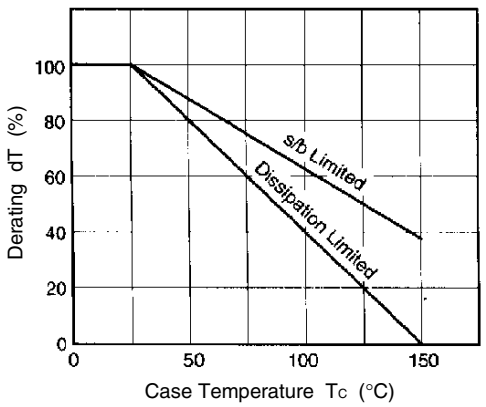


TYPICAL CHARACTERISTICS (T_A = 25°C)

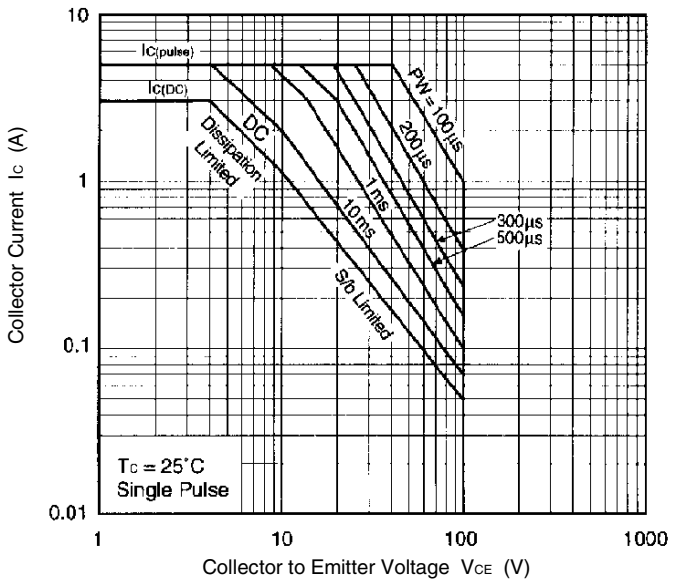
TOTAL POWER DISSIPATION vs. CASE TEMPERATURE



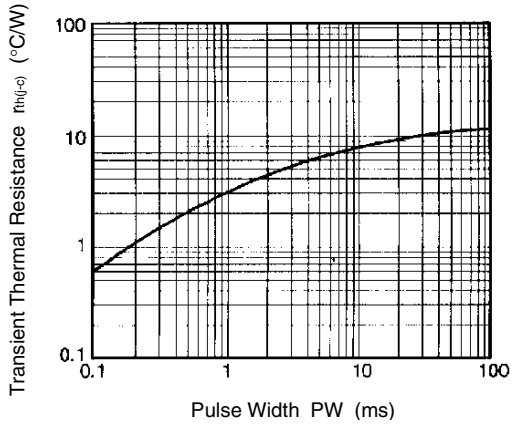
DERATING CURVE OF SAFE OPERATING AREA



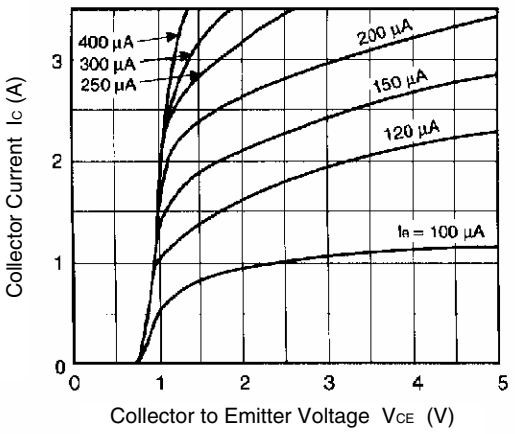
FORWARD BIAS SAFE OPERATING AREA



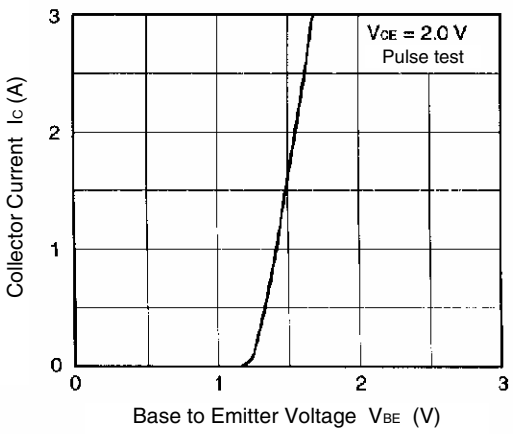
TRANSIENT THERMAL RESISTANCE



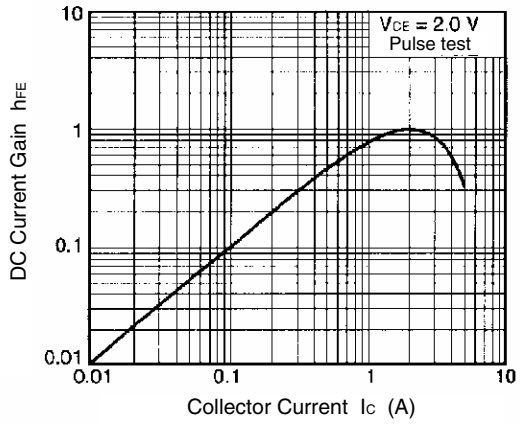
COLLECTOR CURRENT vs.
COLLECTOR TO EMITTER VOLTAGE



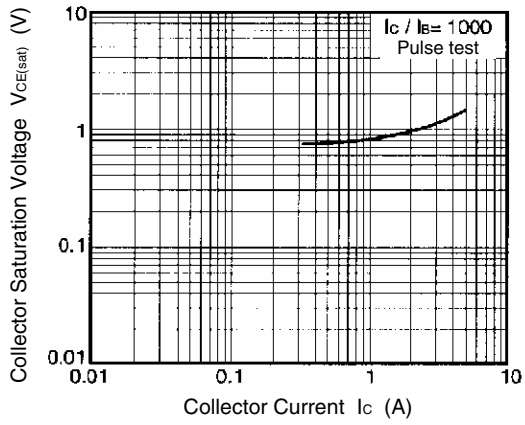
COLLECTOR CURRENT vs. BASE TO
EMITTER VOLTAGE



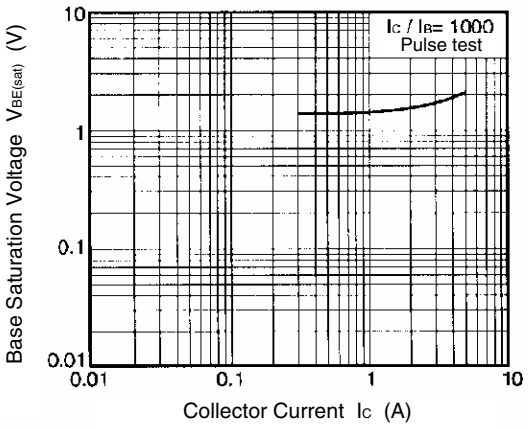
DC CURRENT GAIN vs. COLLECTOR CURRENT



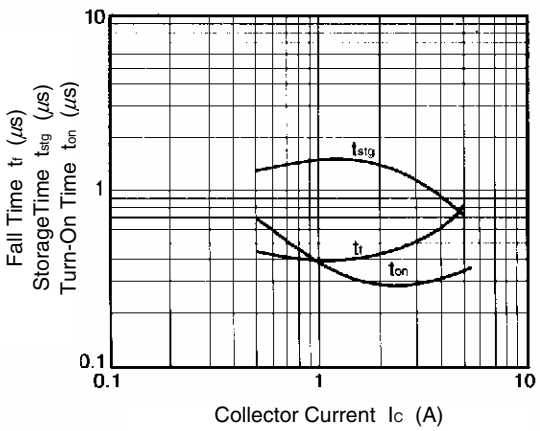
COLLECTOR SATURATION VOLTAGE
vs. COLLECTOR CURRENT



BASE SATURATION VOLTAGE vs.
COLLECTOR CURRENT

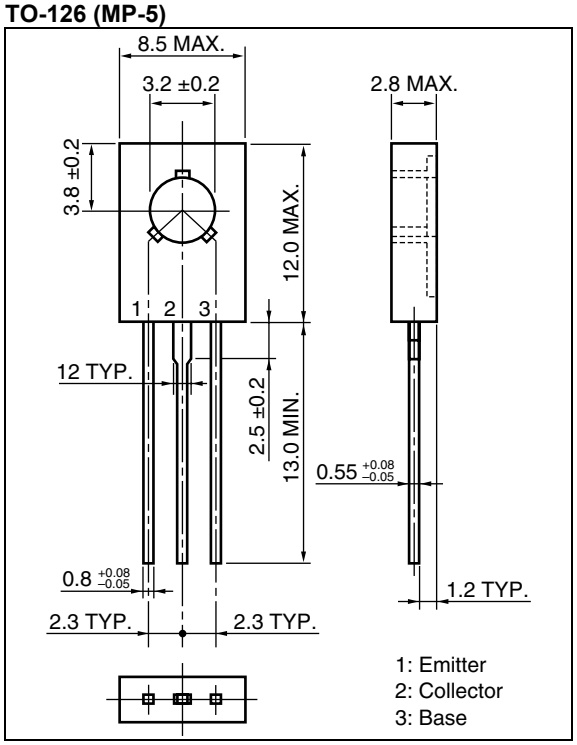


TURN ON TIME, STORAGE TIME AND FALL TIME
vs. COLLECTOR CURRENT

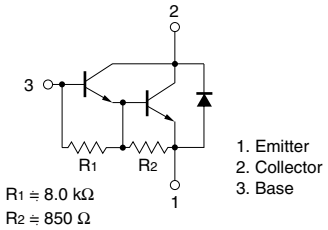


★ PACKAGE DRAWING (Unit: mm)

TO-126 (MP-5)



EQUIVALENT CIRCUIT



R1 ≒ 8.0 kΩ
R2 ≒ 850 Ω

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