

NPN SILICON TRIPLE DIFFUSED TRANSISTOR FOR HIGH SPEED SWITCHING, HIGH VOLTAGE SWITCHING

DESCRIPTION

The 2SC4346 is a mold power transistor developed for high-speed switching, high voltage switching, and is ideal for use as a driver in devices such as switching regulators, DC/DC converters, and high-frequency power amplifiers.

FEATURES

- Small package, but can control for high-current
- Low collector saturation voltage
 $V_{CE(sat)} = 1.0 \text{ V MAX. (I}_c = 2.0 \text{ A)}$
- Ultra high-speed switching
 $t_f = 0.3 \mu\text{s MAX. (I}_c = 2.0 \text{ A)}$
- Base reverse bias safe operating area is wide
 $V_{CEX(SUS)1} = 450 \text{ V MIN. (I}_c = 2.0 \text{ A)}$

ORDERING INFORMATION

PART NUMBER	PACKAGE
2SC4346	TO-251 (MP-3)
2SC4346-Z	TO-252 (MP-3Z)

ABSOLUTE MAXIMUM RATINGS (T_A = 25°C)

Collector to Base Voltage	V _{CBO}	500	V
Collector to Emitter Voltage	V _{CEO}	400	V
Emitter to Base Voltage	V _{EBO}	8.0	V
Collector Current (DC)	I _{C(DC)}	5.0	A
Collector Current (pulse)	I _{C(pulse)} ^{Note1}	10	A
Base current (DC)	I _{B(DC)}	2.5	A
Total Power Dissipation	P _{T1} (T _C = 25°C)	18	W
Total Power Dissipation	P _{T2} (T _A = 25°C)	1.0 ^{Note2} , 2.0 ^{Note3}	W
Junction Temperature	T _j	150	°C
Storage Temperature	T _{stg}	-55 to +150	°C

- Notes**
1. PW ≤ 10 ms, Duty Cycle ≤ 50%
 2. Mounted on print board
 3. Mounted on ceramic substrate of 7.5 mm² x 0.7 mm

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ELECTRICAL CHARACTERISTICS (T_A = 25°C)

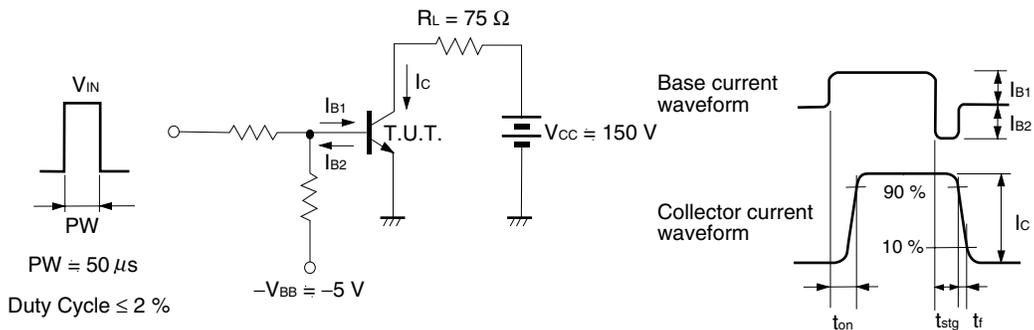
CHARACTERISTICS	SYMBOL	TEST CONDITIONS	MIN.	TYP.	MAX.	UNIT
Collector to Emitter Voltage	V _{CEO(SUS)}	I _C = 2.0 A, I _{B1} = 0.4 A, L = 1 mH	400			V
	V _{CEX(SUS)1}	I _C = 2.0 A, I _{B1} = -I _{B2} = 0.4 A, L = 180 μH, Clamped	450			V
	V _{CEX(SUS)2}	I _C = 4.0 A, I _{B1} = 1.0 A, -I _{B2} = 0.4 A, L = 180 μH, Clamped	400			V
Collector Cut-off Current	I _{CB0}	V _{CB} = 400 V, I _E = 0			10	μA
	I _{CER}	V _{CB} = 400 V, R _{BE} = 51 Ω, T _A = 125°C			1.0	mA
	I _{CEx1}	V _{CB} = 400 V, V _{BE(OFF)} = -5 V			100	μA
	I _{CEx2}	V _{CB} = 400 V, V _{BE(OFF)} = -5 V, T _A = 125°C			1.0	mA
Emitter Cut-off Current	I _{EBO}	V _{EB} = 5.0 V, I _C = 0			10	μA
DC Current Gain ^{Note}	h _{FE1}	V _{CE} = 5.0 V, I _C = 5 mA	15			
	h _{FE2}	V _{CE} = 5.0 V, I _C = 0.5 A	20		80	
	h _{FE3}	V _{CE} = 5.0 V, I _C = 2.0 A	10			
Collector Saturation Voltage ^{Note}	V _{CE(sat)}	I _C = 2.0 A, I _B = 0.4 A		0.5	1.0	V
Base Saturation Voltage ^{Note}	V _{BE(sat)}	I _C = 2.0 A, I _B = 0.4 A		1.0	1.5	V
Turn-on Time	t _{on}	I _C = 2.0 A, R _L = 75 Ω			0.7	μs
Storage Time	t _{stg}	I _{B1} = -I _{B2} = 0.4 A, V _{CC} ≐ 150 V			2.5	μs
Fall Time	t _f	See Test Circuit			0.3	μs

Note Pulsed

h_{FE} CLASSIFICATION

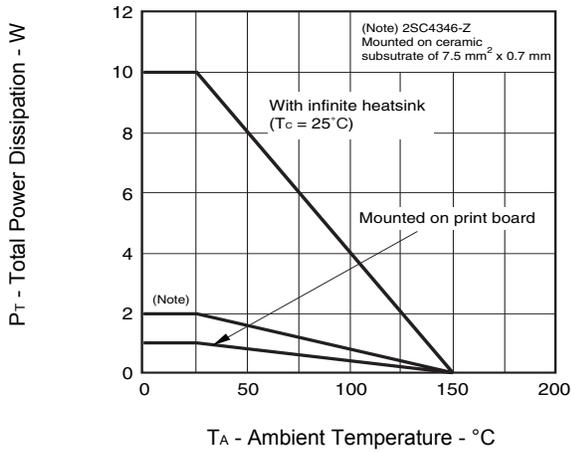
Marking	M	L	K
h _{FE2}	20 to 40	30 to 60	40 to 80

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

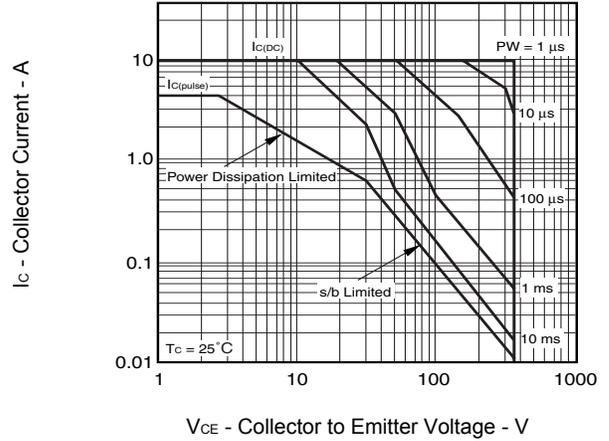


TYPICAL CHARACTERISTICS (T_A = 25°C)

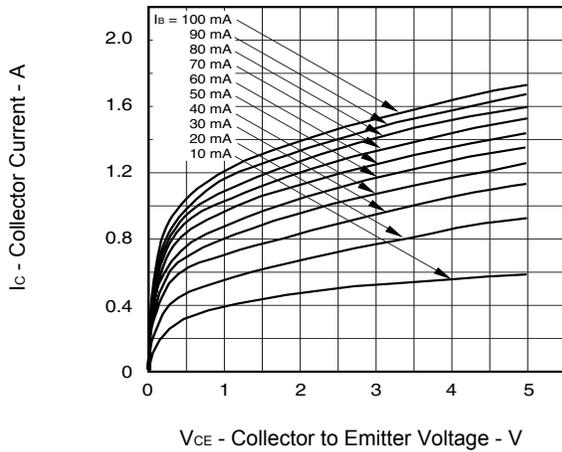
TOTAL POWER DISSIPATION vs. AMBIENT TEMPERATURE



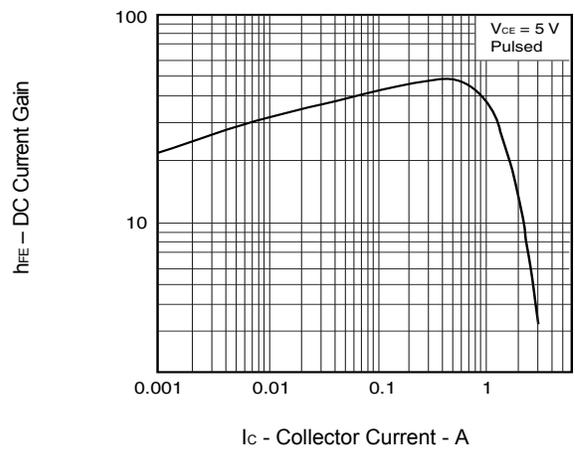
FORWARD BIAS SAFE OPERATING AREA



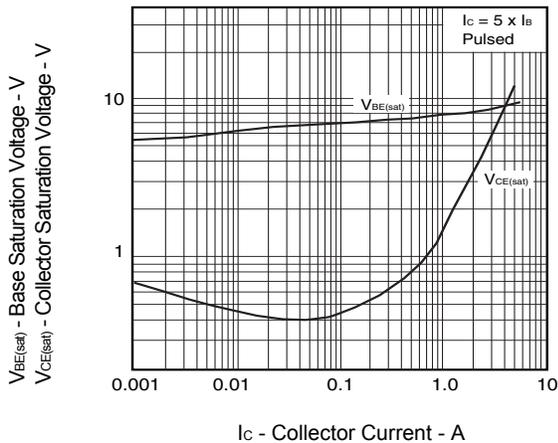
COLLECTOR CURRENT vs. COLLECTOR TO EMITTER VOLTAGE



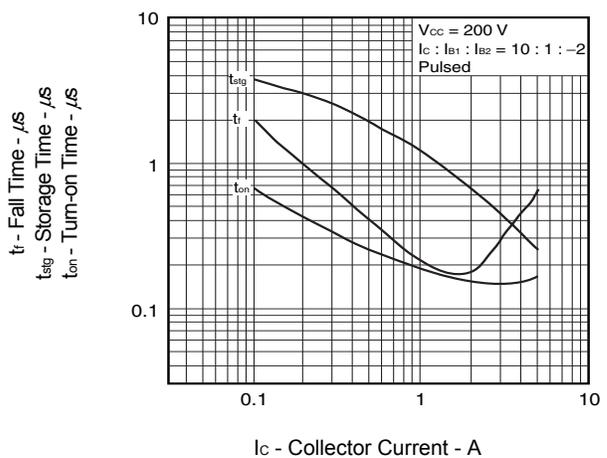
DC CURRENT GAIN vs. COLLECTOR CURRENT



COLLECTOR AND BASE SATURATION VOLTAGE vs. COLLECTOR CURRENT

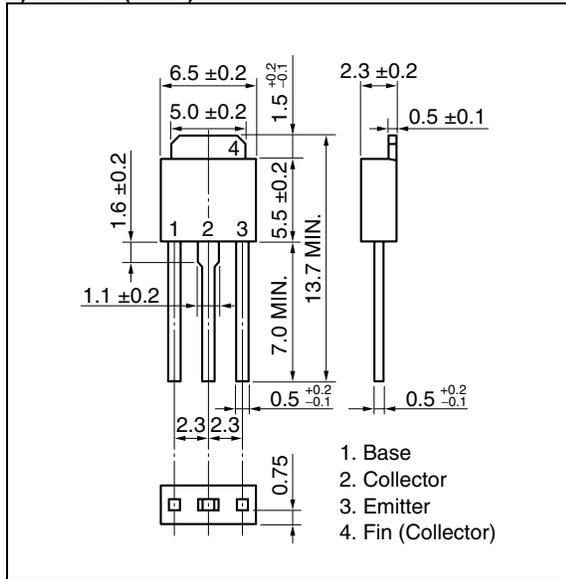


TURN-ON, STORAGE TIME AND FALL TIME vs. COLLECTOR CURRENT

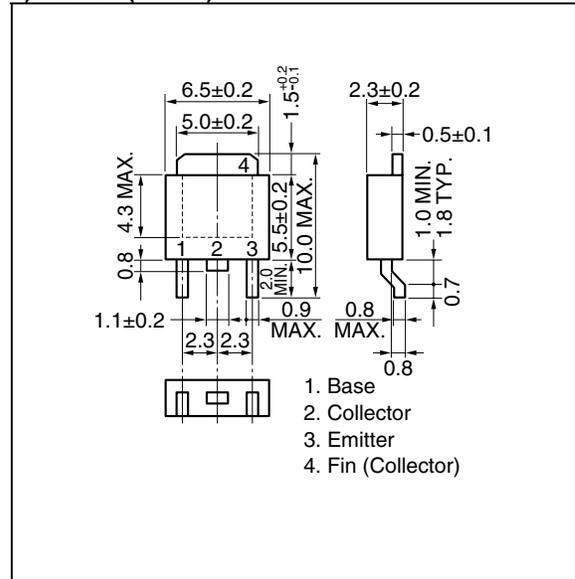


PACKAGE DRAWINGS (Unit: mm)

★ 1) TO-251 (MP-3)



2) TO-252 (MP-3Z)



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