



SANYO Semiconductors

## DATA SHEET

# 2SD2176 — NPN Epitaxial Planar Silicon Transistor

## Motor Driver Applications

### Features

- Darlington connection.
- On-chip Zener diode of  $60\pm 10\text{V}$  between collector and base.
- High inductive load handling capability.
- Small-sized package.

### Specifications

**Absolute Maximum Ratings** at  $T_a=25^\circ\text{C}$

Parameter	Symbol	Conditions	Ratings	Unit
Collector-to-Base Voltage	$V_{CB0}$	On-chip Zener diode ( $60\pm 10\text{V}$ )	50	V
Collector-to-Emitter Voltage	$V_{CEO}$	On-chip Zener diode ( $60\pm 10\text{V}$ )	50	V
Emitter-to-Base Voltage	$V_{EBO}$		6	V
Collector Current	$I_C$		1.2	A
Collector Current (Pulse)	$I_{CP}$		2.5	A
Base Current	$I_B$		0.2	A
Collector Dissipation	$P_C$	Mounted on a ceramic board ( $250\text{mm}^2 \times 0.8\text{mm}$ )	1.3	W
Junction Temperature	$T_j$		150	$^\circ\text{C}$
Storage Temperature	$T_{stg}$		-55 to +150	$^\circ\text{C}$

**Electrical Characteristics** at  $T_a=25^\circ\text{C}$

Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Collector Cutoff Current	$I_{CBO}$	$V_{CB}=40\text{V}$ , $I_E=0\text{A}$			10	$\mu\text{A}$
Emitter Cutoff Current	$I_{EBO}$	$V_{EB}=5\text{V}$ , $I_C=0\text{A}$			2	mA
DC Current Gain	$h_{FE}$	$V_{CE}=3\text{V}$ , $I_C=500\text{mA}$	1000		20000	
Collector-to-Emitter Saturation Voltage	$V_{CE(sat)}$	$I_C=500\text{mA}$ , $I_B=1\text{mA}$		1.0	1.5	V
Base-to-Emitter Saturation Voltage	$V_{BE(sat)}$	$I_C=500\text{mA}$ , $I_B=1\text{mA}$		1.5	2	V

Marking : DQ

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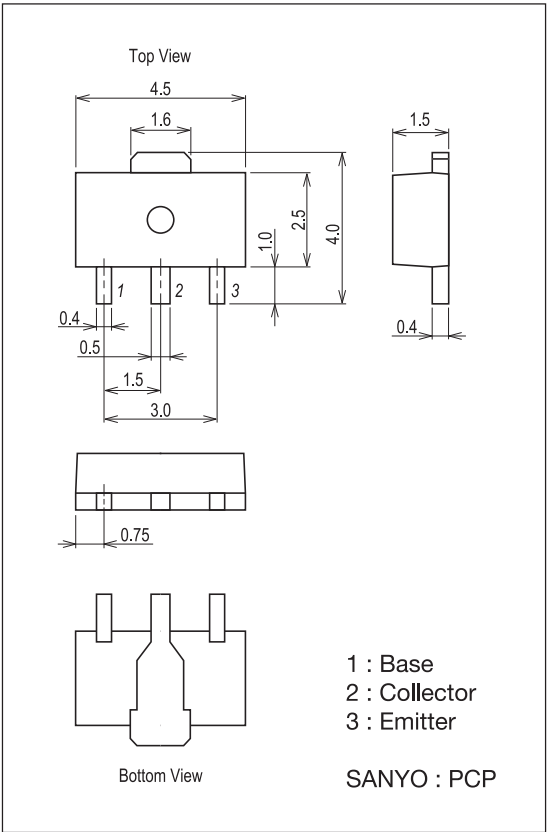
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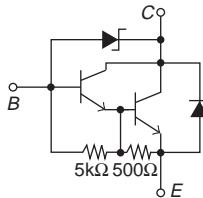
Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Collector-to-Base Breakdown Voltage	$V_{(BR)CBO}$	$I_C=100\mu A, I_E=0A$	50		70	V
Collector-to-Emitter Breakdown Voltage	$V_{(BR)CEO}$	$I_C=1mA, R_{BE}=\infty$	50		70	V
Inductive Load Handling Capability	Es/b	$L=300mH, R_{BE}=100\Omega$	15			mJ

Package Dimensions

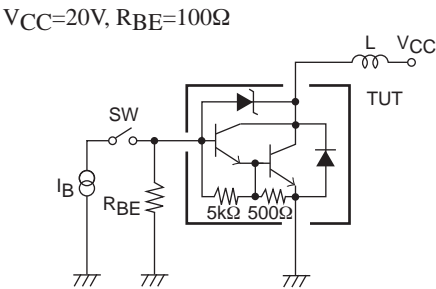
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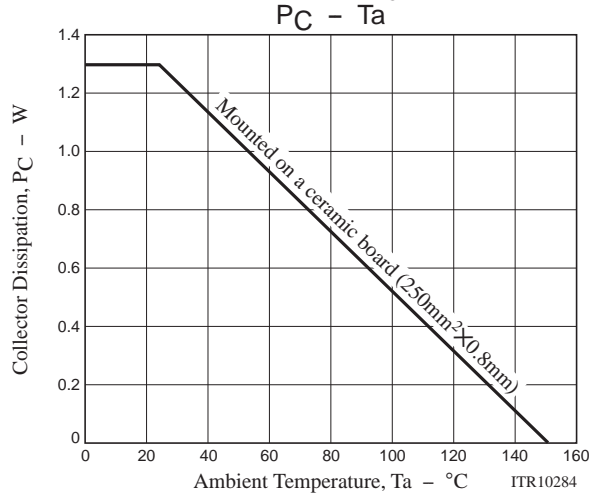
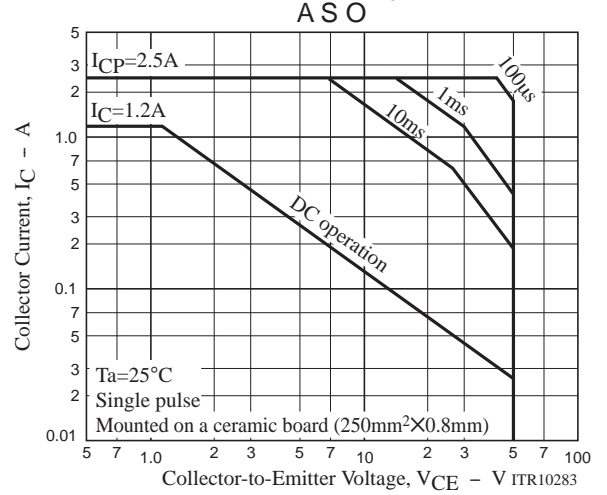
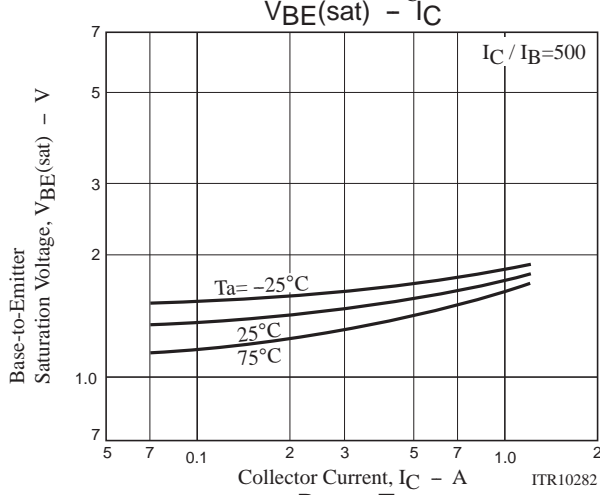
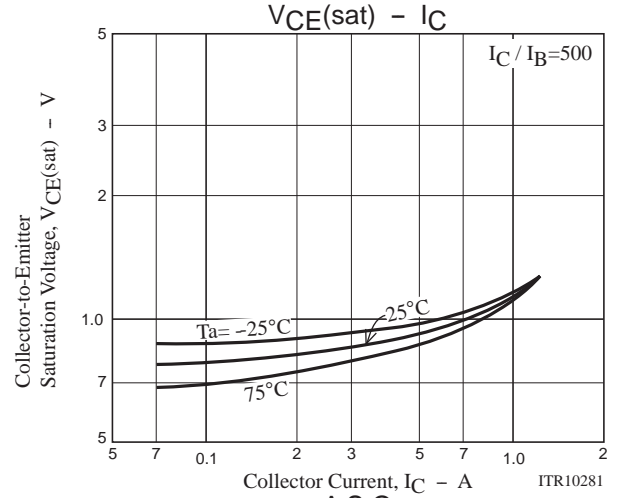
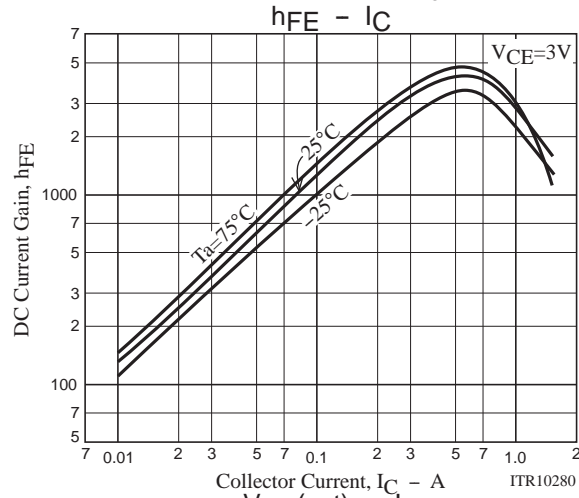
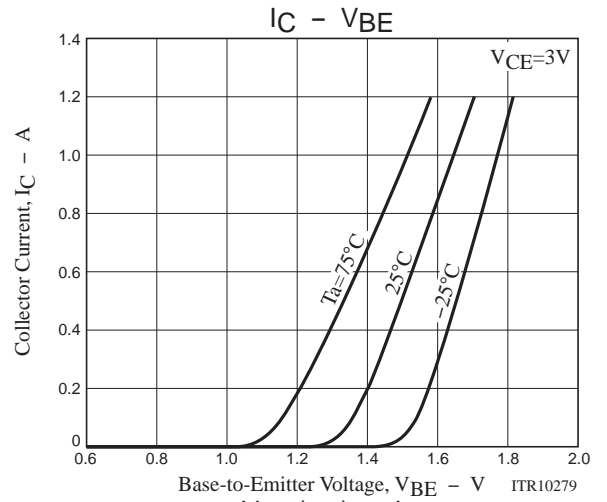
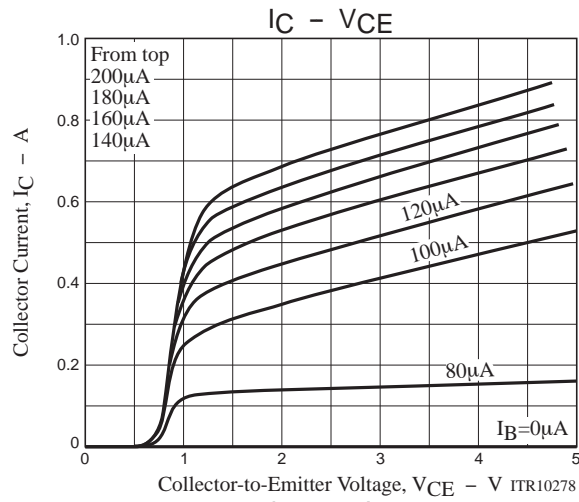


Electrical Connection



Es/b Test Circuit





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