

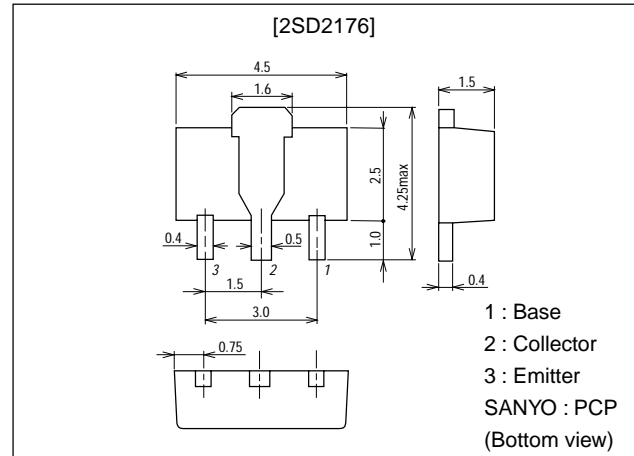
**2SD2176****Motor Driver Applications****Features**

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

Package Dimensions

unit:mm

2038A

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

Parameter	Symbol	Conditions	Ratings	Unit
Collector-to-Base Voltage	V_{CBO}	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 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}	$V_{\text{CB}}=40\text{V}, I_{\text{E}}=0$			10	μA
Emitter Cutoff Current	I_{EBO}	$V_{\text{EB}}=5\text{V}, I_{\text{C}}=0$			2	mA
DC Current Gain	h_{FE}	$V_{\text{CE}}=3\text{V}, I_{\text{C}}=500\text{mA}$	1000		20000	
Collector-to-Emitter Saturation Voltage	$V_{\text{CE(sat)}}$	$I_{\text{C}}=500\text{mA}, I_{\text{B}}=1\text{mA}$		1.0	1.5	V
Base-to-Emitter Saturation Voltage	$V_{\text{BE(sat)}}$	$I_{\text{C}}=500\text{mA}, I_{\text{B}}=1\text{mA}$		1.5	2	V
Collector-to-Base Breakdown Voltage	$V_{\text{(BR)CBO}}$	$I_{\text{C}}=100\mu\text{A}, I_{\text{E}}=0$	50		70	V
Collector-to-Emitter Breakdown Voltage	$V_{\text{(BR)CEO}}$	$I_{\text{C}}=1\text{mA}, R_{\text{BE}}=\infty$	50		70	V
Inductive Load Handling Capability	Es/b	$L=30\text{mH}, R_{\text{BE}}=100\Omega$	15			mJ

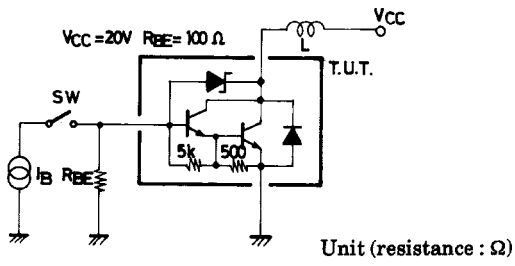
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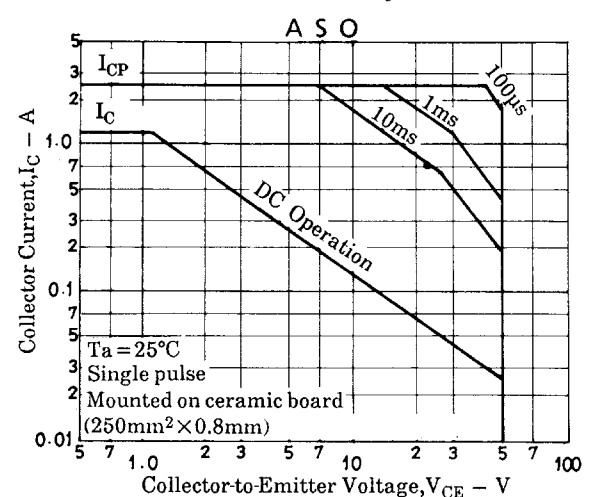
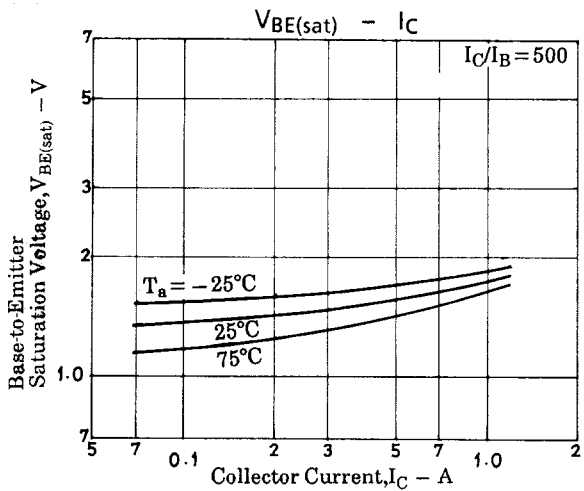
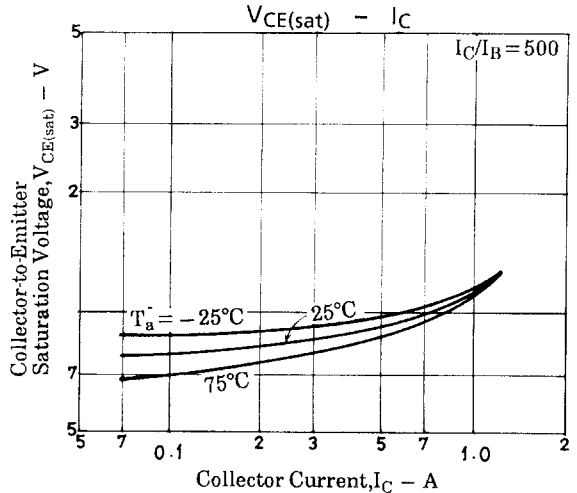
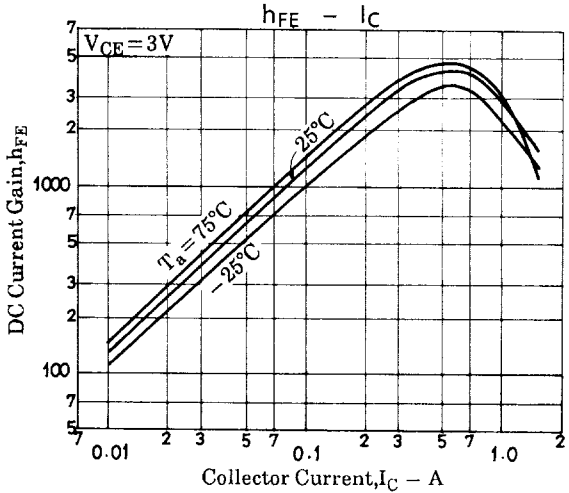
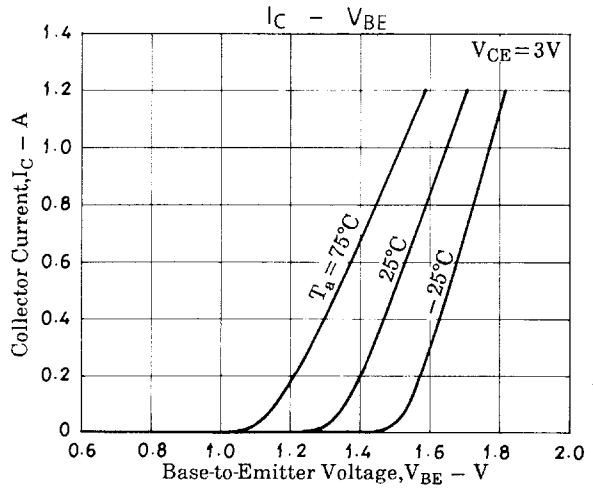
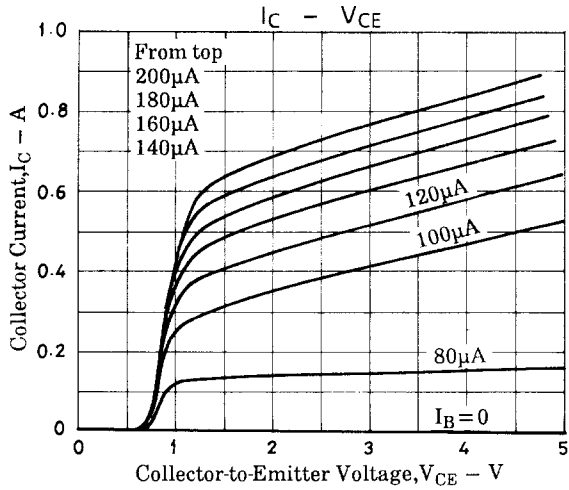
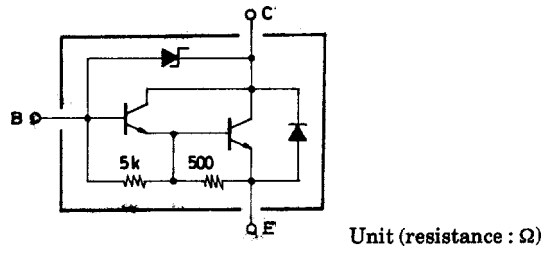
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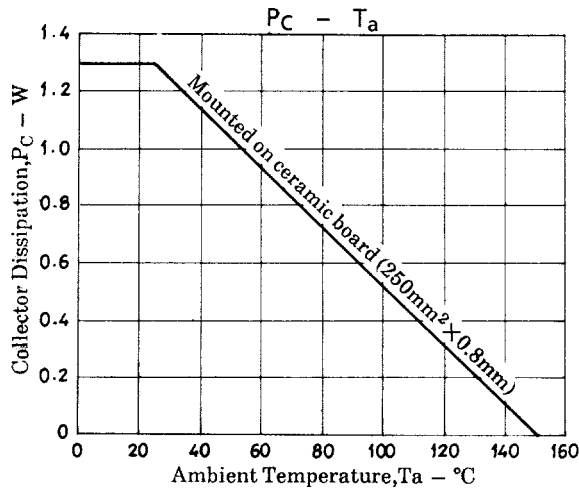
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Es/b Test Circuit



Electrical Connection





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