

DARLINGTON POWER TRANSISTOR

2SA1841

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

DESCRIPTION

The 2SA1841 is a high-speed Darlington power transistor.

This transistor is ideal for high-precision control such as PWM control for pulse motors brushless motors in OA and FA equipment.

In addition, this transistor features a package that can be auto-mounted in radial taping specifications, thus contributing to mounting cost reduction.

★ ORDERING INFORMATION

PART NUMBER	PACKAGE
2SA1841	MP-10

FEATURES

- Auto-mounting possible in radial taping specifications
- Resin-molded insulation type package with power rating of 1.8 W in stand-alone conditions
- High DC current amplifiers due to Darlington connection
 $h_{FE} = 4000 \text{ to } 20000$ ($V_{CE} = -2.0 \text{ V}$, $I_C = -4.0 \text{ A}$)
- On-chip C-to-E reverse diode
- Fast switching speed

ABSOLUTE MAXIMUM RATINGS ($T_A = 25^\circ\text{C}$)

Collector to Base Voltage	V_{CBO}	-100	V
Collector to Emitter Voltage	V_{CEO}	-100	V
Emitter to Base Voltage	V_{EBO}	-8.0	V
Collector Current (DC)	$I_{C(DC)}$	-8.0	A
Collector Current (pulse)	$I_{C(pulse)}$ ^{Note}	-16	A
Base Current (DC)	$I_{B(DC)}$	-0.8	A
Total Power Dissipation ($T_A = 25^\circ\text{C}$)	P_T	1.8	W
Junction Temperature	T_j	150	$^\circ\text{C}$
Storage Temperature	T_{stg}	-55 to +150	$^\circ\text{C}$

Note $PW \leq 10 \text{ ms}$, Duty Cycle $\leq 2\%$

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CHARACTERISTICS	SYMBOL	TEST CONDITIONS	MIN.	TYP.	MAX.	UNIT
Collector Cut-off Current	I_{CBO}	$V_{CB} = -100\text{ V}, I_E = 0\text{ A}$			-1.0	μA
Emitter Cut-off Current	I_{EBO}	$V_{EB} = -5.0\text{ V}, I_C = 0\text{ A}$			-5.0	mA
DC Current Gain Note	h_{FE1}	$V_{CE} = -2.0\text{ V}, I_C = -4.0\text{ A}$	4000		20000	
	h_{FE2}	$V_{CE} = -2.0\text{ V}, I_C = -8.0\text{ A}$	500			
Collector Saturation Voltage Note	$V_{CE(sat)}$	$I_C = -4.0\text{ A}, I_B = -4.0\text{ mA}$			-1.5	V
Base Saturation Voltage Note	$V_{BE(sat)}$	$I_C = -4.0\text{ A}, I_B = -4.0\text{ mA}$			-2.0	V
Turn-on Time	t_{on}	$I_C = -4.0\text{ A}$		0.2		μs
Storage Time	t_{stg}	$I_{B1} = -I_{B2} = -4.0\text{ mA}$		1.5		μs
Fall Time	t_f	$R_L = 12.5\ \Omega, V_{CC} = -50\text{ V}$		0.7		μs

★ hFE CLASSIFICATION

Marking	L	K
hFE1	4000 to 10000	8000 to 20000

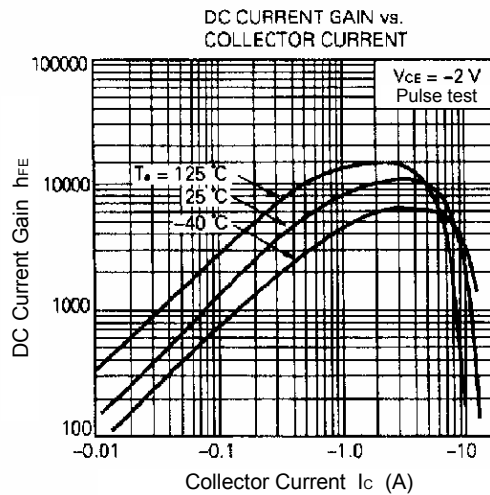
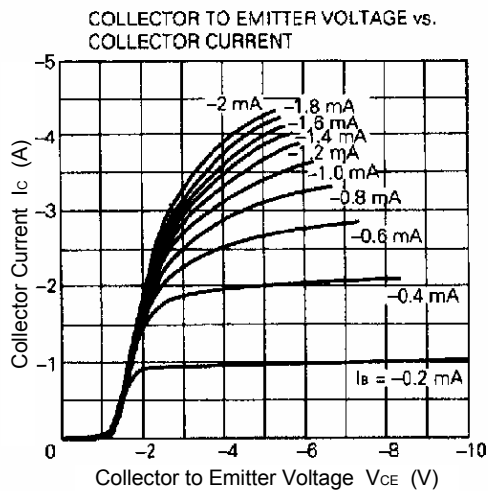
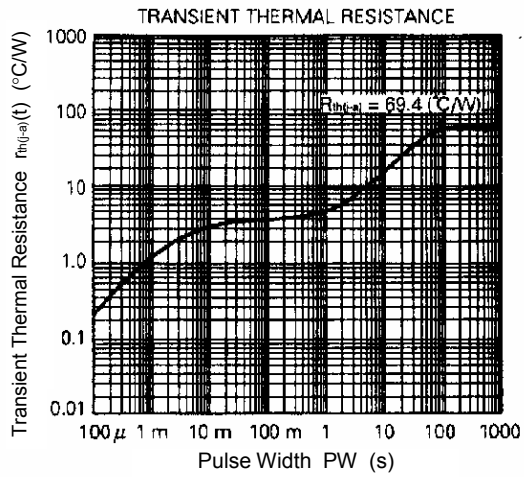
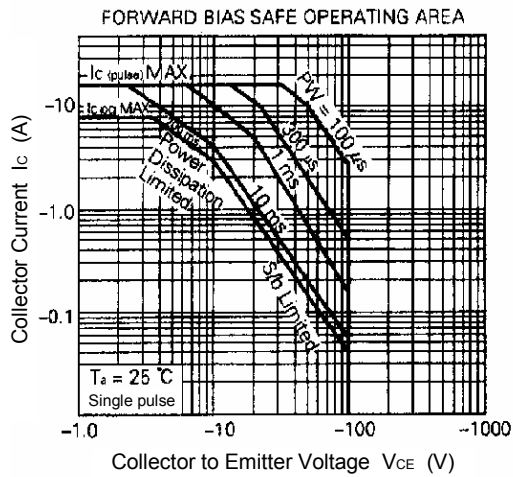
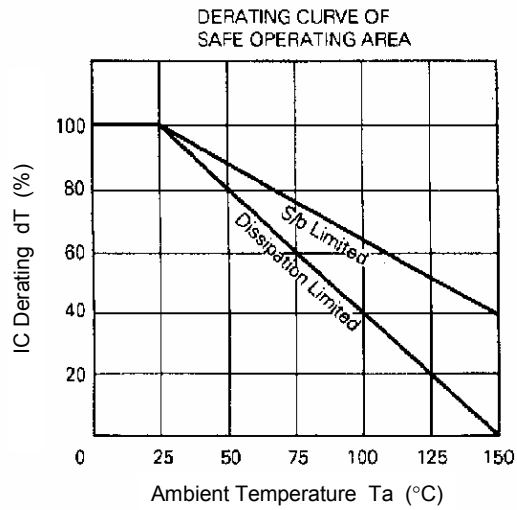
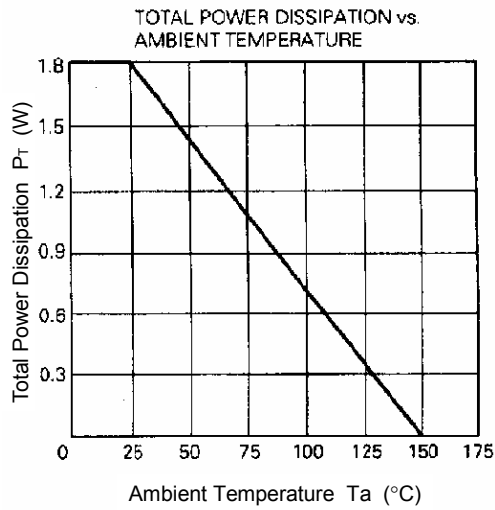
V_{IN}
 $PW \approx 50 \mu s$
 $Duty Cycle \leq 2\%$

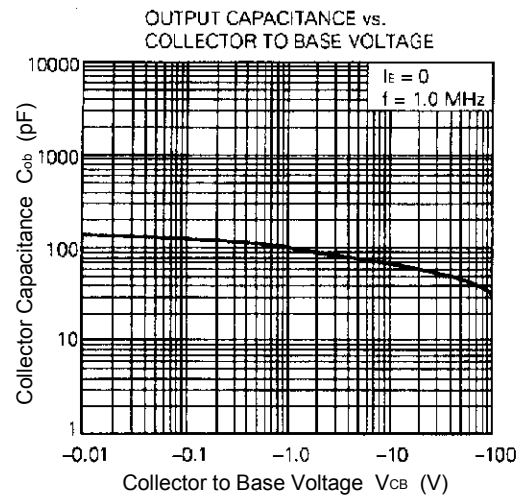
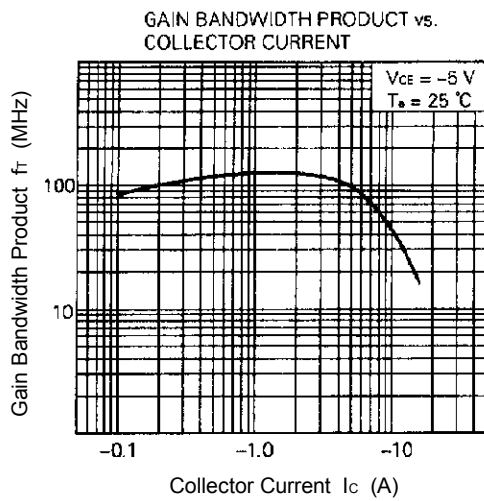
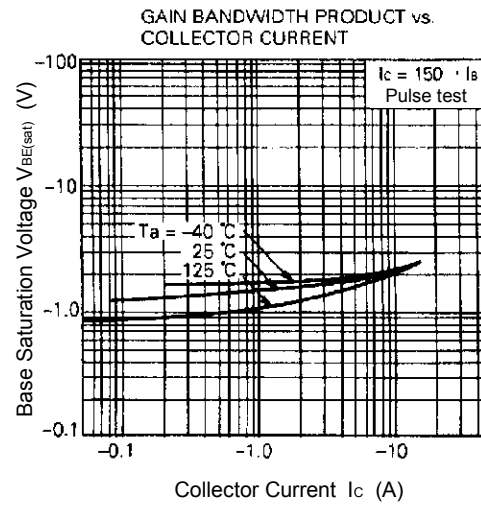
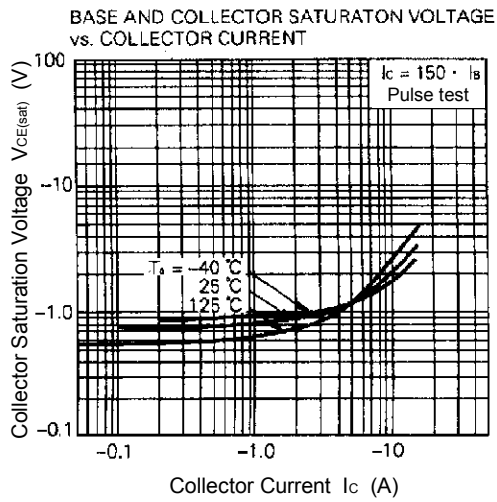
I_{B1}
 I_{B2}
 $V_{BB} \approx -5 V$

R_L
 I_C
 $T.U.T.$
 V_{CC}

Base current waveform
 Collector current waveform
 10%
 90%
 I_C
 t_{on}
 t_{stg}
 t_r

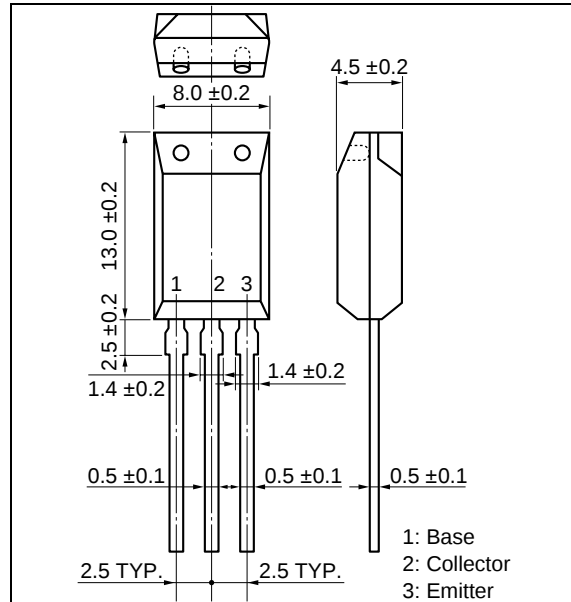
TYPICAL CHARACTERISTICS ($T_A = 25^\circ\text{C}$)



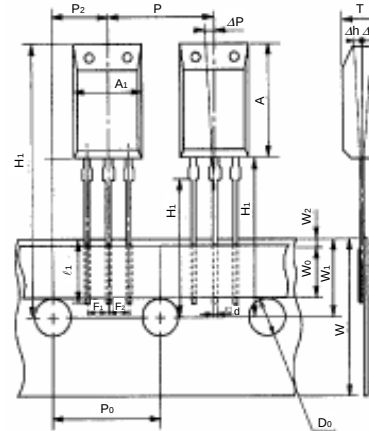


★ PACKAGE DRAWING (Unit: mm)

MP-10

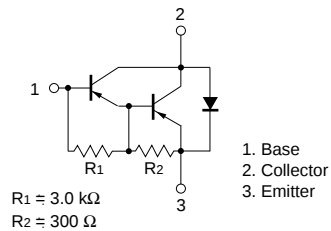


TAPING SPECIFICATION



A ₁	8.0 ± 0.2
A	13.0 ± 0.2
D ₀	φ4.0 ± 0.2
d	0.5 ± 0.1
F ₁	2.5 ^{+0.4} _{-0.1}
F ₂	2.5 ^{+0.4} _{-0.1}
H	20.0 MAX.
H ₀	16.0 ± 0.5
H ₁	32.2 MAX.
Δh	0 ± 1.0
ℓ ₁	2.5 MIN.
P	12.7 ± 1.0
P ₀	12.7 ± 0.3
P ₂	6.35 ± 0.5
ΔP	0 ± 1.3
T	4.5 ± 0.2
W	18.0 ^{+1.0} _{-0.5}
W ₀	5.0 MIN.
W ₁	9.0 ± 0.5
W ₂	0.7 MIN.

EQUIVALENT CIRCUIT



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