

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.

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
 $h_{FE} = 4000$ to 20000 ($V_{CE} = -2.0$ V, $I_C = -4.0$ 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 $PW \leq 10$ ms, Duty Cycle $\leq 2\%$

★ ORDERING INFORMATION

PART NUMBER	PACKAGE
2SA1841	MP-10

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ELECTRICAL CHARACTERISTICS (T_A = 25°C)

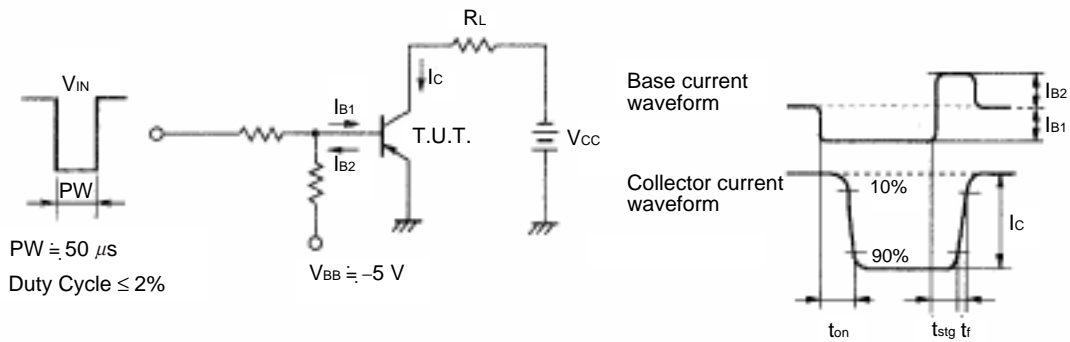
CHARACTERISTICS	SYMBOL	TEST CONDITIONS	MIN.	TYP.	MAX.	UNIT
Collector Cut-off Current	I _{CBO}	V _{CB} = -100 V, I _E = 0 A			-1.0	μA
Emitter Cut-off Current	I _{EBO}	V _{EB} = -5.0 V, I _C = 0 A			-5.0	mA
DC Current Gain ^{Note}	h _{FE1}	V _{CE} = -2.0 V, I _C = -4.0 A	4000		20000	
	h _{FE2}	V _{CE} = -2.0 V, I _C = -8.0 A	500			
Collector Saturation Voltage ^{Note}	V _{CE(sat)}	I _C = -4.0 A, I _B = -4.0 mA			-1.5	V
Base Saturation Voltage ^{Note}	V _{BE(sat)}	I _C = -4.0 A, I _B = -4.0 mA			-2.0	V
Turn-on Time	t _{on}	I _C = -4.0 A		0.2		μs
Storage Time	t _{stg}	I _{B1} = -I _{B2} = -4.0 mA		1.5		μs
Fall Time	t _f	R _L = 12.5 Ω, V _{CC} = -50 V		0.7		μs

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

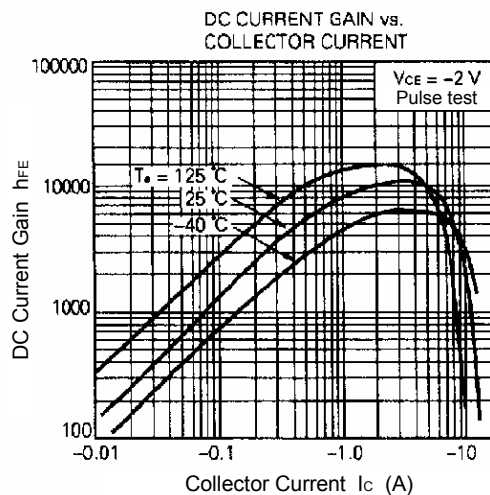
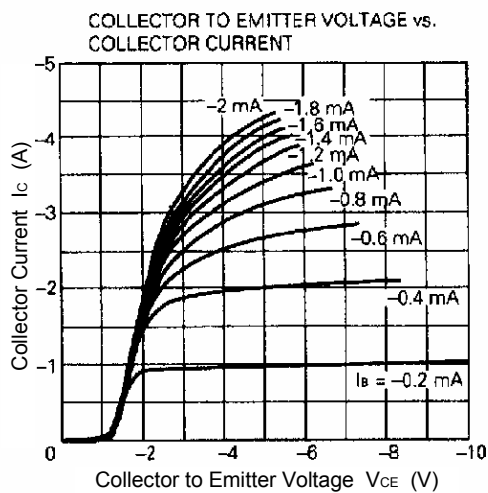
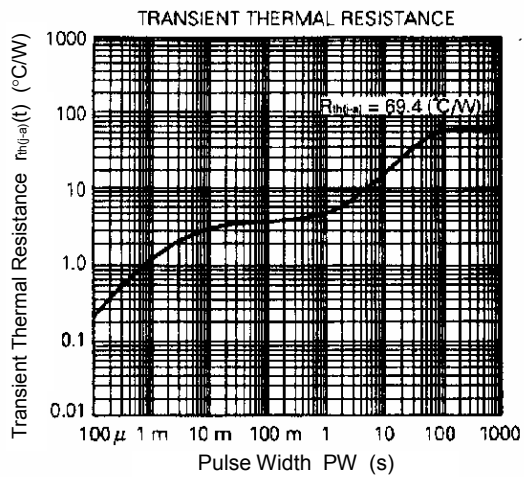
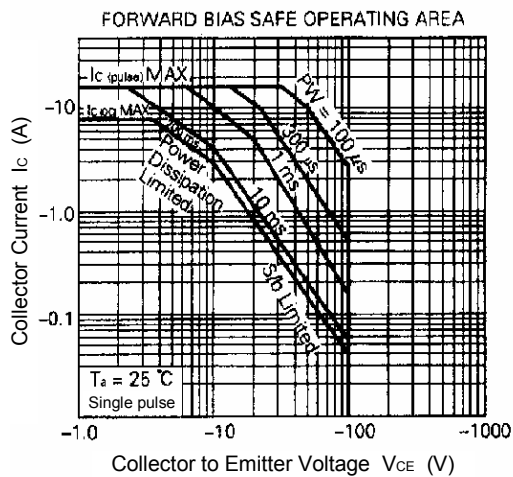
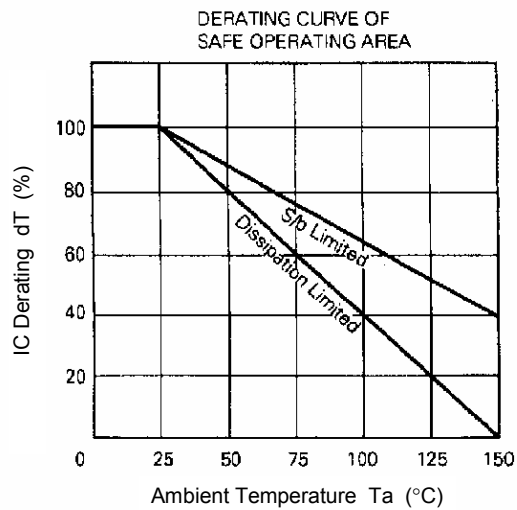
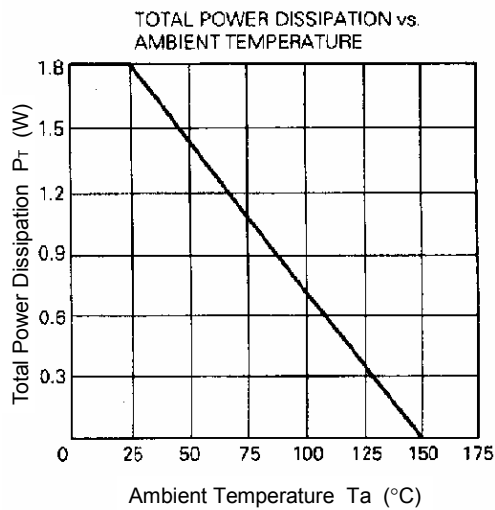
★ h_{FE} CLASSIFICATION

Marking	L	K
h _{FE1}	4000 to 10000	8000 to 20000

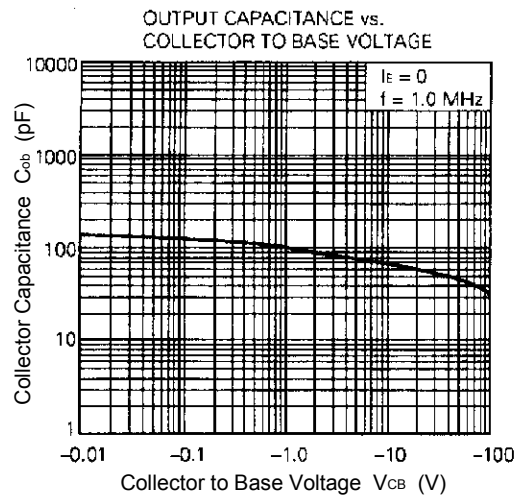
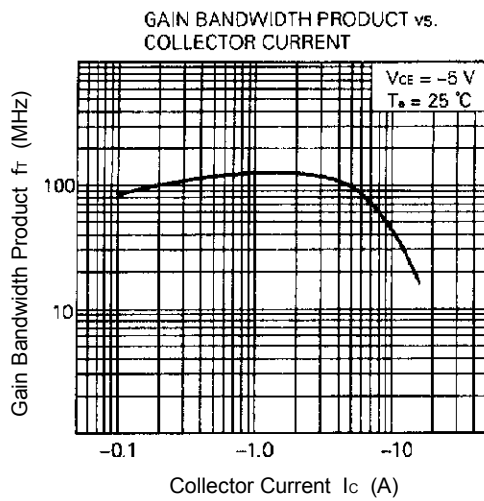
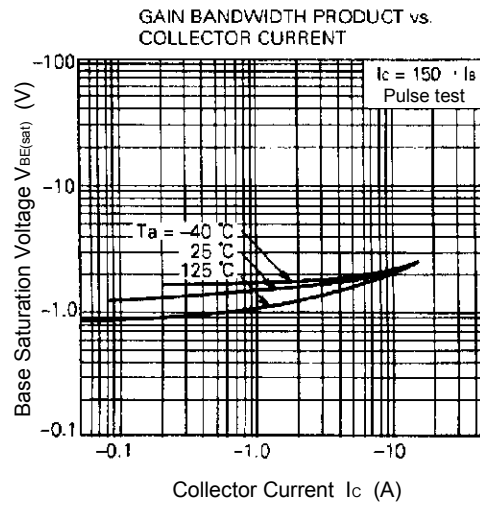
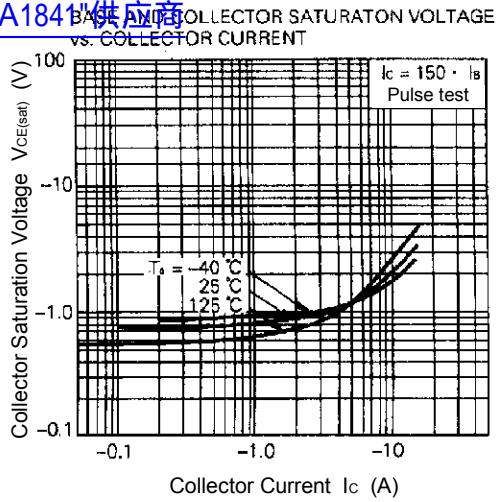
SWITCHING TIME (t_{on}, t_{stg}, t_f) TEST CIRCUIT



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TYPICAL CHARACTERISTICS (T_A = 25°C)

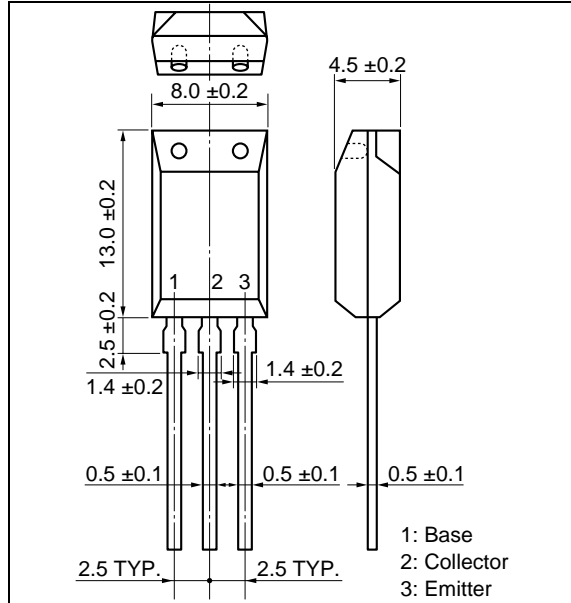


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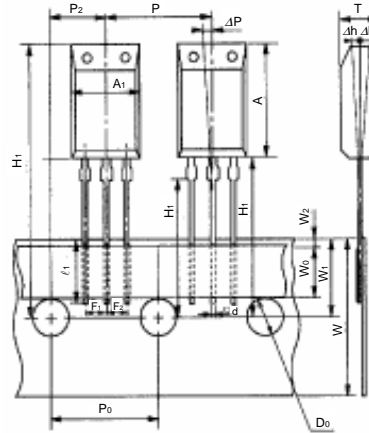


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 * PACKAGE DRAWING (Unit: mm)

MP-10

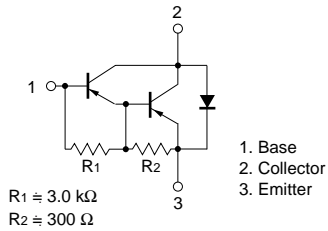


TAPING SPECIFICATION



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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