

isc Silicon NPN Darlington Power Transistor
2SD1413
DESCRIPTION

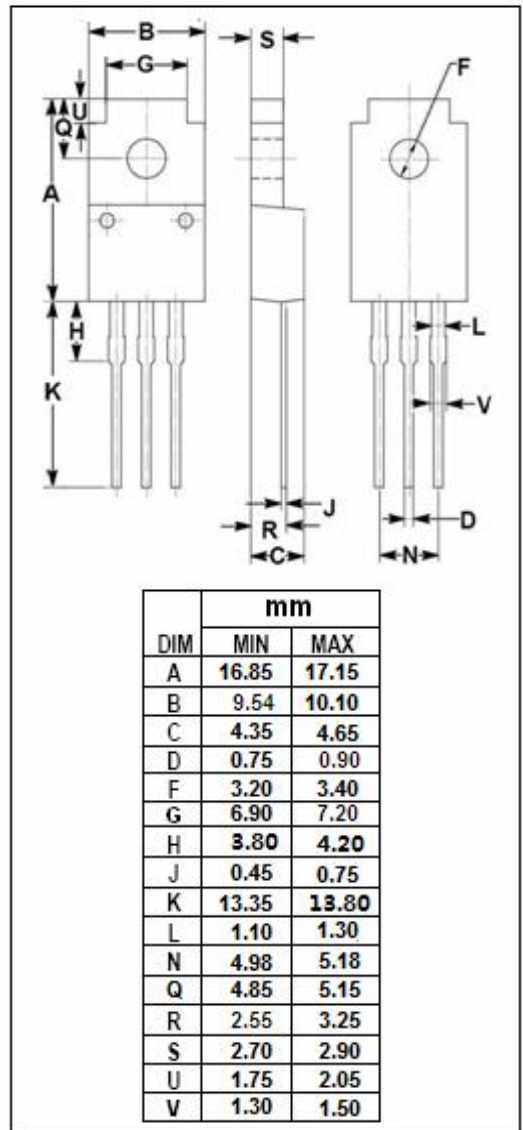
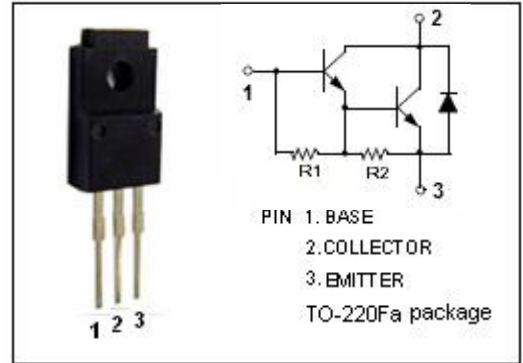
- Collector-Emitter Breakdown Voltage-
: $V_{(BR)CEO} = 40V(\text{Min})$
- Collector-Emitter Saturation Voltage-
: $V_{CE(sat)} = 1.5V(\text{Max}) @ I_C = 2A$
- High DC Current Gain
: $h_{FE} = 2000(\text{Min}) @ I_C = 1A, V_{CE} = 2V$
- Complement to Type 2SB1023
- Minimum Lot-to-Lot variations for robust device performance and reliable operation

APPLICATIONS

- Switching applications
- Hammer driver, pulse motor driver applications
- Power amplifier applications.

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

SYMBOL	PARAMETER	VALUE	UNIT
V_{CBO}	Collector-Base Voltage	60	V
V_{CEO}	Collector-Emitter Voltage	40	V
V_{EBO}	Emitter-Base Voltage	5	V
I_C	Collector Current-Continuous	3	A
I_B	Base Current-Continuous	0.5	A
P_C	Collector Power Dissipation @ $T_c = 25^\circ\text{C}$	20	W
T_J	Junction Temperature	150	$^\circ\text{C}$
T_{stg}	Storage Temperature Range	-55~150	$^\circ\text{C}$



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ELECTRICAL CHARACTERISTICS

T_c=25°C unless otherwise specified

SYMBOL	PARAMETER	CONDITIONS	MIN	TYP.	MAX	UNIT
V _{(BR)CEO}	Collector-Emitter Breakdown Voltage	I _C = 25mA; I _B = 0	40			V
V _{CE(sat)}	Collector-Emitter Saturation Voltage	I _C = 2A; I _B = 4mA			1.5	V
V _{BE(sat)}	Base-Emitter Saturation Voltage	I _C = 2A; I _B = 4mA			2.0	V
I _{CBO}	Collector Cutoff Current	V _{CB} = 60V; I _E = 0			20	μ A
I _{EBO}	Emitter Cutoff Current	V _{EB} = 5V; I _C = 0			2.5	mA
h _{FE-1}	DC Current Gain	I _C = 1A; V _{CE} = 2V	2000			
h _{FE-2}	DC Current Gain	I _C = 3A; V _{CE} = 2V	1000			

Switching times

t _{on}	Turn-on Time	I _{B1} = I _{B2} = 6mA R _L = 10 Ω; V _{CC} = 30V P _W =20 μ s; Duty Cycle ≤ 1%		0.1		μ s
t _{stg}	Storage Time			1.0		μ s
t _f	Fall Time			0.2		μ s

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