

SPTECH Silicon PNP Power Transistor

2SA1441

DESCRIPTION

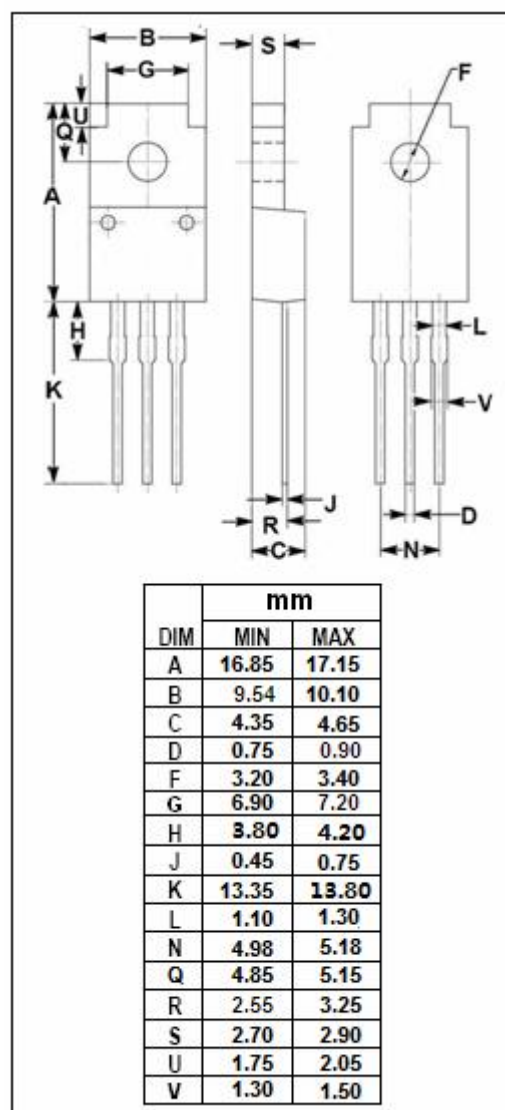
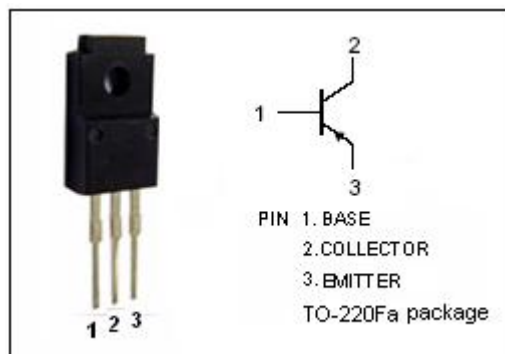
- Collector-Emitter Sustaining Voltage-
: $V_{CE(SUS)} = -60V(\text{Min})$
- High DC Current Gain-
: $h_{FE} = 100(\text{Min})@ (V_{CE} = -2V, I_C = -1A)$
- Low Saturation Voltage-
: $V_{CE(sat)} = -0.3V(\text{Max})@ (I_C = -3A, I_B = -0.15A)$

APPLICATIONS

- This type of power transistor is developed for high-speed switching and features a high h_{FE} at low $V_{CE(sat)}$, which is ideal for use as a driver in DC/DC converters and actuators.

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

SYMBOL	PARAMETER	VALUE	UNIT
V_{CBO}	Collector-Base Voltage	-100	V
V_{CEO}	Collector-Emitter Voltage	-60	V
V_{EBO}	Emitter-Base Voltage	-7.0	V
I_C	Collector Current-Continuous	-5.0	A
I_{CM}	Collector Current-Pulse	-10	A
I_B	Base Current-Continuous	-2.5	A
P_T	Total Power Dissipation @ $T_C=25^\circ\text{C}$	25	W
	Total Power Dissipation @ $T_a=25^\circ\text{C}$	2.0	
T_J	Junction Temperature	150	$^\circ\text{C}$
T_{stg}	Storage Temperature	-55~150	$^\circ\text{C}$



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ELECTRICAL CHARACTERISTICS

 $T_j=25^{\circ}\text{C}$ unless otherwise specified

SYMBOL	PARAMETER	CONDITIONS	MIN	TYP.	MAX	UNIT
$V_{CEO(SUS)}$	Collector-Emitter Sustaining Voltage	$I_C = -3.0\text{A}$; $I_B = -0.3\text{A}$, $L = 1\text{mH}$	-60			V
$V_{CEX(SUS)}$	Collector-Emitter Sustaining Voltage	$I_C = -3.0\text{A}$; $I_{B1} = -I_{B2} = -0.3\text{A}$, $V_{BE(OFF)} = 1.5\text{V}$, $L = 180\text{ }\mu\text{H}$, clamped	-60			V
$V_{CE(sat)-1}$	Collector-Emitter Saturation Voltage	$I_C = -3\text{A}$; $I_B = -0.15\text{A}$			-0.3	V
$V_{CE(sat)-2}$	Collector-Emitter Saturation Voltage	$I_C = -4\text{A}$; $I_B = -0.2\text{A}$			-0.5	V
$V_{BE(sat)-1}$	Base-Emitter Saturation Voltage	$I_C = -3\text{A}$; $I_B = -0.15\text{A}$			-1.2	V
$V_{BE(sat)-2}$	Base-Emitter Saturation Voltage	$I_C = -4\text{A}$; $I_B = -0.2\text{A}$			-1.5	V
I_{CBO}	Collector Cutoff Current	$V_{CB} = -60\text{V}$; $I_E = 0$			-10	μA
I_{CER}	Collector Cutoff Current	$V_{CE} = -60\text{V}$; $R_{BE} = 50\text{ }\Omega$, $T_a = 125^{\circ}\text{C}$			-1.0	mA
I_{CEX}	Collector Cutoff Current	$V_{CE} = -60\text{V}$; $V_{BE(off)} = -1.5\text{V}$ $V_{CE} = -60\text{V}$; $V_{BE(off)} = -1.5\text{V}$, $T_a = 125^{\circ}\text{C}$			-10 -1.0	μA mA
I_{EBO}	Emitter Cutoff Current	$V_{EB} = -5\text{V}$; $I_C = 0$			-10	μA
h_{FE-1}	DC Current Gain	$I_C = -0.5\text{A}$; $V_{CE} = -2\text{V}$	100			
h_{FE-2}	DC Current Gain	$I_C = -1.0\text{A}$; $V_{CE} = -2\text{V}$	100		400	
h_{FE-3}	DC Current Gain	$I_C = -3.0\text{A}$; $V_{CE} = -2\text{V}$	60			
C_{OB}	Output Capacitance	$I_E = 0$; $V_{CB} = -10\text{V}$; $f = 1.0\text{MHz}$		130		pF
f_T	Current-Gain—Bandwidth Product	$I_C = -0.5\text{A}$; $V_{CE} = -10\text{V}$		80		MHz

Switching times

t_{on}	Turn-on Time	$I_C = -3.0\text{A}$, $R_L = 17\text{ }\Omega$, $I_{B1} = -I_{B2} = -0.15\text{A}$, $V_{CC} \approx -50\text{V}$			0.3	μs
t_{stg}	Storage Time				1.5	μs
t_f	Fall Time				0.3	μs

◆ h_{FE-2} Classifications

M	L	K
100-200	150-300	200-400