

# SILICON HIGH SPEED POWER TRANSISTOR

# 2SA 1077

September 1979

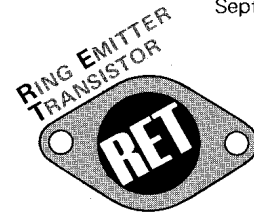
## SILICON PNP RING EMITTER TRANSISTOR (RET)

The 2SA 1077 is silicon PNP general purpose, high power switching transistors fabricated with Fujitsu's unique Ring Emitter Transistor (RET) technology. RET devices are constructed with multiple emitters connected through diffused ballast resistors which provide uniform current density. This structure permits the design of high power transistors with exceptional switching characteristics and frequency response in high current applications.

The 2SA 1077 is especially well-suited for High frequency power amplifiers, Audio power amplifiers, Switching regulators and DC-DC Converters.

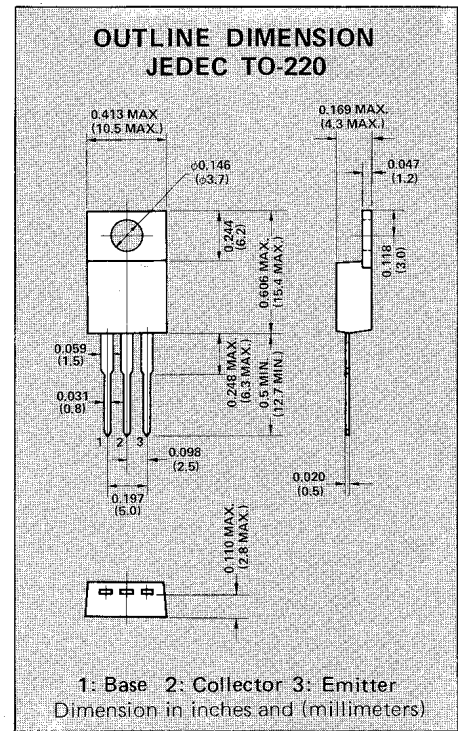
A NPN complement, 2SC 2527, is available.

- High  $f_T = 60$  MHz (typ)
- Ultra fast switching speed
- Excellent Safe Operating Area
- Improved reverse Second-Breakdown Capability



## ABSOLUTE MAXIMUM RATINGS

Rating	Symbol	Value	Unit
Collector to Base Voltage	$V_{CBO}$	120	V
Emitter to Base Voltage	$V_{EBO}$	7	V
Collector to Emitter Voltage	$V_{CEO}$	120	V
Collector Current	$I_C$	10	A
Collector Power Dissipation ( $T_C = 25^\circ\text{C}$ )	$P_C$	60	W
Junction Temperature	$T_j$	150	$^\circ\text{C}$
Storage Temperature Range	$T_{stg}$	-65~+150	$^\circ\text{C}$



## ELECTRICAL CHARACTERISTICS ( $T_a = 25^\circ\text{C}$ )

Parameter	Symbol	Test Conditions	Limits			Unit
			Min.	Typ.	Max.	
Collector Cutoff Current	$I_{CBO}$	$V_{CB} = 120\text{V}, I_E = 0$	—	—	50	$\mu\text{A}$
Emitter Cutoff Current	$I_{EBO}$	$V_{EB} = 7\text{V}, I_C = 0$	—	—	50	$\mu\text{A}$
Collector Cutoff Current	$I_{CEO}$	$V_{CE} = 120\text{V}, I_B = 0$	—	—	1	mA
Collector to Base Breakdown Voltage	$V_{(BR)CBO}$	$I_C = 50\mu\text{A}, I_E = 0$	120	—	—	V
Emitter to Base Breakdown Voltage	$V_{(BR)EBO}$	$I_E = 50\mu\text{A}, I_C = 0$	7	—	—	V
Collector to Emitter Breakdown Voltage	$V_{(BR)CEO}$	$I_C = 1\text{mA}, R_{BE} = \infty$	120	—	—	V
DC Current Gain	$h_{FE1}$	$V_{CE} = 5\text{V}, I_C = 1\text{A}$ *	60	—	200	
DC Current Gain	$h_{FE2}$	$V_{CE} = 5\text{V}, I_C = 5\text{A}$ *	40	—	—	
Collector to Emitter Saturation Voltage	$V_{CE(sat)}$	$I_C = 5\text{A}, I_B = 0.5\text{A}$ *	—	0.9	1.8	V
Base to Emitter Voltage	$V_{BE}$	$V_{CE} = 5\text{V}, I_C = 5\text{A}$ *	—	1.25	1.7	V
Gain-Bandwidth Product	$f_T$	$V_{CE} = 10\text{V}, I_C = 1\text{A}, f = 10\text{MHz}$	30	60	—	MHz
Output Capacitance	$C_{ob}$	$V_{CB} = 10\text{V}, I_E = 0, f = 1\text{MHz}$	—	300	470	pF
Rise Time	$t_r$	$I_C = 7.5\text{A}, R_L = 4\Omega$ $I_{B1} = -I_{B2} = 0.75\text{A}$	—	0.15	—	$\mu\text{s}$
Storage Time	$t_{stg}$		—	0.5	—	$\mu\text{s}$
Fall Time	$t_f$		—	0.11	—	$\mu\text{s}$

\* Pulsed: Pulse Width  $\leq 300\mu\text{s}$   
Duty Cycle  $\leq 6\%$