FUJITSU

SILICON HIGH SPEED POWER TRANSISTORS

2SC 2431 (FT3812)
2SC 2432 (FT3862)

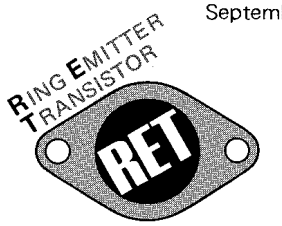
September 1979

SILICON NPN RING EMITTER TRANSISTOR (RET)

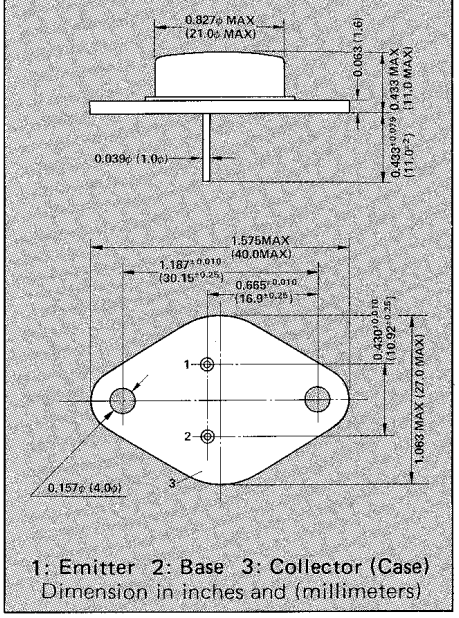
The 2SC2431/2SC2432 are silicon NPN general purpose, high power switching transistors fabricated with Fujitsu's unique Ring Emitter Transistor (RET) technology. RET devices are constructed with multiple emitters connected through diffused ballast resistors which provide uniform current density. This structure permits the design of high power transistors with exceptional switching characteristics and frequency response in high current applications.

The 2SC2431/2SC2432 are especially well-suited for switching regulators, DC to DC converters, power amplifiers or other applications where large SOA is required. PNP complements, 2SA1041/2SA1042, are available.

- Ultra-fast switching speed at 10A
  t_r = 0.20 μs typ
  t_{off} = 0.35 μs typ
- Improved Reverse Second-Breakdown Capability
- Excellent Safe Operating Area
- High f_T = 80 MHz (typ)



OUTLINE DIMENSION
JEDEC TO-3



1: Emitter 2: Base 3: Collector (Case)
Dimension in inches and (millimeters)

ABSOLUTE MAXIMUM RATINGS

Rating	Symbol	Value		Unit
		2SC2431	2SC2432	
Collector to Base Voltage	V_{CBO}	120	70	V
Emitter to Base Voltage	V_{EBO}	5	5	V
Collector to Emitter Voltage	V_{CEO}	120	70	V
Collector Current	I_C	15	15	A
Base Current	I_B	5	5	A
Collector Power Dissipation (T_C = 25°C)	P_C	100	100	W
Junction Temperature	T_j	+175		°C
Storage Temperature Range	T_{stg}	-65 ~ +175		°C

ELECTRICAL CHARACTERISTICS (T_a = 25°C)

Parameter	Symbol	Test Conditions		Limits						Unit
				2SC2431			2SC2432			
				Min.	Typ.	Max.	Min.	Typ.	Max.	
Collector Cutoff Current	I_{CBO}	V_{CB}=120V, I_E=0		–	–	50	–	–	–	μA
Collector Cutoff Current	I_{CBO}	V_{CB}=70V, I_E=0		–	–	–	–	–	50	μA
Emitter Cutoff Current	I_{EBO}	V_{EB}=4V, I_C=0		–	–	50	–	–	50	μA
Collector Cutoff Current	I_{CEO}	V_{CE}=120V, I_B=0		–	–	1	–	–	–	mA
Collector Cutoff Current	I_{CEO}	V_{CE}=70V, I_B=0		–	–	–	–	–	1	mA
Collector to Base Breakdown Voltage	$V_{(BR)CBO}$	I_C=50μA, I_E=0		120	–	–	70	–	–	V
Emitter to Base Breakdown Voltage	$V_{(BR)EBO}$	I_E=1mA, I_C=0		5	–	–	5	–	–	V
Collector to Emitter Breakdown Voltage	$V_{(BR)CEO}$	I_C=10mA, R_{BE}=∞		120	–	–	70	–	–	V
DC Current Gain	h_{FE1}	V_{CE}=5V, I_C=1.5A	*	35	–	200	35	–	200	
DC Current Gain	h_{FE2}	V_{CE}=5V, I_C=15A	*	7	–	–	10	–	–	
Collector to Emitter Saturation Voltage	$V_{CE(sat)}$	I_C=7A, I_B=0.7A	*	–	0.5	1.5	–	0.5	1.5	V
Base to Emitter Saturation Voltage	$V_{BE(sat)}$		*	–	–	1.8	–	–	1.8	V
Gain-Bandwidth Product	f_T	V_{CE}=10V, I_C=1A		–	80	–	–	80	–	MHz
Output Capacitance	C_{ob}	V_{CB}=10V, I_E=0, f=1MHz		–	250	–	–	250	–	pF
Rise Time	t_r	I_C=10A, R_L=3Ω, I_{B1} = -I_{B2} = 1A		–	0.20	–	–	0.20	–	μs
Storage Time	t_{stg}			–	0.20	–	–	0.20	–	μs
Fall Time	t_f			–	0.15	–	–	0.15	–	μs

* Pulsed: Pulse Width ≦ 300 μs
Duty Cycle ≦ 6%