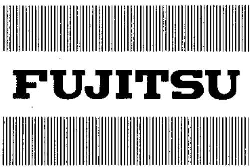
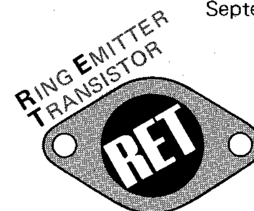


SILICON HIGH SPEED POWER TRANSISTORS

2SC 2433
(FT3813)

2SC 2434
(FT3863)

September 1979

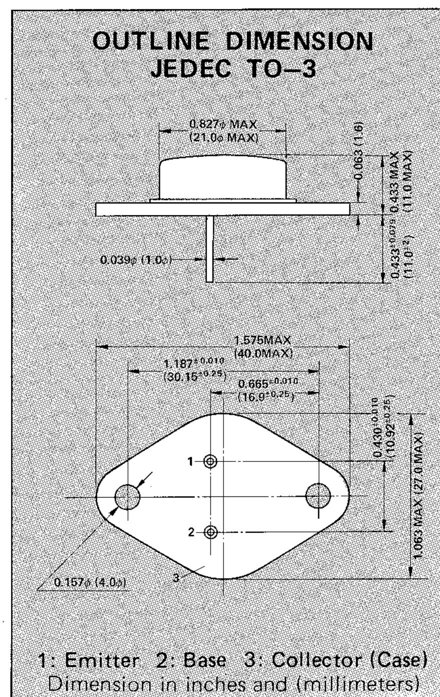


SILICON NPN RING EMITTER TRANSISTOR (RET)

The 2SC2433/2SC2434 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 2SC2433/2SC2434 are especially well-suited for switching regulators, DC to DC converters, power amplifiers or other applications where large SOA is required. PNP complements, 2SA1043/2SA1044, are available.

- Ultra-fast switching speed at 15A
  - t_r = 0.15 μs typ
  - t_{off} = 0.55 μs typ
- Improved Reverse Second-Breakdown Capability
- Excellent Safe Operating Area
- High f_T = 80 MHz (typ)



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

ABSOLUTE MAXIMUM RATINGS

Rating	Symbol	Value		Unit
		2SC2433	2SC2434	
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	30	30	A
Base Current	I_B	10	10	A
Collector Power Dissipation (T_C = 25°C)	P_C	150	150	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
			2SC2433			2SC2434			
			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 = 3A *	35	–	200	35	–	200	
DC Current Gain	h_{FE2}	V_{CE} = 5V, I_C = 30A *	7	–	–	10	–	–	
Collector to Emitter Saturation Voltage	$V_{CE(sat)}$	I_C = 15A, I_B = 1.5A *	–	0.8	1.5	–	0.8	1.5	V
Base to Emitter Saturation Voltage	$V_{BE(sat)}$		–	–	2.0	–	–	2.0	V
Gain-Bandwidth Product	f_T	V_{CE} = 10V, I_C = 2A	–	80	–	–	80	–	MHz
Output Capacitance	C_{ob}	V_{CB}=10V, I_E=0, f=1MHz	–	500	–	–	500	–	pF
Rise Time	t_r	I_C = 15A, R_L = 2Ω, I_{B1} = $-I_{B2}$ = 1.5A	–	0.15	–	–	0.15	–	μs
Storage Time	t_{stg}		–	0.40	–	–	0.40	–	μs
Fall Time	t_f		–	0.15	–	–	0.15	–	μs

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