

2SA1043, 2SA1044, 2SC2433, 2SC2434

Silicon High Speed Power Transistor

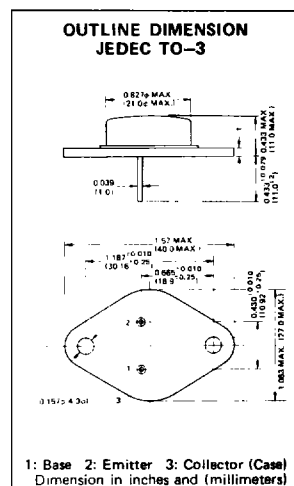
DESCRIPTION

This series are silicon PNP/NPN planer 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 superior switching characteristics and frequency response in high current applications.

This series are especially well-suited for high speed/high voltage switching systems or other applications where large SOA is required.

Features

	2SA1043, 2SA1044	2SC2433, 2SC2434
★ f_T :	60MHz (typ.)	80MHz (typ.)
★ t_r :	0.20 μ s (typ.)	0.28 μ s (typ.)
★ t_s :	0.24 μ s (typ.)	0.70 μ s (typ.)
★ t_f :	0.08 μ s (typ.)	0.15 μ s (typ.)
★ Excellent Safe Operating Area :	2SA1043–2SC2433	
★ Complements :	2SA1044–2SC2434	



ABSOLUTE MAXIMUM RATINGS

Rating	Symbol	Value		Value		Unit
		2SA1043	2SA1044	2SC2433	2SC2434	
Collector to Base Voltage	V_{CBO}	-120	-70	120	70	V
Emitter to Base Voltage	V_{EBO}	-5	-5	5	5	V
Collector to Emitter Voltage	V_{CEO}	-120	-70	120	70	V
Collector Current	I_C	-30	-30	30	30	A
Base Current	I_B	-10	-10	10	10	A
Collector Power Dissipation ($T_C = 25^\circ\text{C}$)	P_C	150	150	150	150	W
Junction Temperature	T_j	+175		+175		$^\circ\text{C}$
Storage Temperature Range	T_{stg}	-65 ~ +175		-65 ~ +175		$^\circ\text{C}$

2SA1043, 2SA1044, 2SC2433, 2SC2434

ELECTRICAL CHARACTERISTICS (T_a = 25°C)

2SA1043, 2SA1044

Parameter	Symbol	Test Conditions	Limits						Unit
			2SA1043			2SA1044			
			Min.	Typ.	Max.	Min.	Typ.	Max.	
Collector Cutoff Current	I_{CBO}	$V_{CB} = -120V, I_E = 0$	—	—	-50	—	—	—	-50
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	$V_{(BR)CBO}$	$I_C = -50 \mu A, I_E = 0$	-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	$V_{(BR)CEO}$	$I_C = -10mA, R_{BE} = \infty \Omega$	-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	$V_{CE(sat)}$	$I_C = -15A, I_B = -1.5A^*$	—	-0.7	-1.5	—	-0.5	-1.5	V
Base to Emitter Saturation Voltage	$V_{BE(sat)}$		—	-1.2	-2.0	—	-1.1	-2.0	V
Gain-Bandwidth Product	f_T	$V_{CE} = -10V, I_C = -2A$	—	60	—	—	60	—	MHz
Output Capacitance	C_{ob}	$V_{CB} = -10V, I_E = 0, f = 1MHz$	—	600	—	—	700	—	pF
Rise Time	t_r	$I_C = -15A, R_L = 2\Omega$	—	0.20	0.8	—	0.20	0.8	μs
Storage Time	t_{stg}	$I_B1 = -I_{B2} = -1.5A$	—	0.24	1.0	—	0.24	1.0	μs
Fall Time	t_f		—	0.08	0.8	—	0.08	0.8	μs

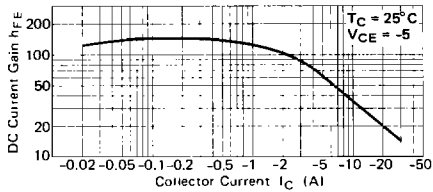
2SC2433, 2SC2434

Parameter	Symbol	Test Conditions	Limits						Unit
			25C2433			25C2432			
			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}	$I_{CE} = 70V, I_B = 0$	—	—	—	—	—	1	mA
Collector to Base Breakdown Voltage	$V_{(BR)CBO}$	$I_C = 50 \mu A, I_E = 0$	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	$V_{(BR)CEO}$	$I_C = 10mA, R_{BE} = \infty \Omega$	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	$V_{CE(sat)}$	$I_C = 15A, I_B = 1.5A^*$	—	0.5	1.5	—	0.5	1.5	V
Base to Emitter Saturation Voltage	$V_{BE(sat)}$		—	1.2	2.0	—	1.2	2.0	V
Gain-Bandwidth Product	f_T	$V_{CE} = 10V, I_C = 2A$	—	80	—	—	80	—	MHz
Output Capacitance	C_{ob}	$V_{CB} = 10V, I_E = 0, f = 1MHz$	—	350	—	—	350	—	pF
Rise Time	t_r	$I_C = 15A, R_L = 2\Omega$	—	0.28	0.8	—	0.28	0.8	μs
Storage Time	t_{stg}	$I_{B1} = -I_{B2} = 1.5A$	—	0.70	1.0	—	0.70	1.0	μs
Fall Time	t_f		—	0.15	0.8	—	0.15	0.8	μs

* Pulsed P_W ≤ 300 μs, Duty Ratio ≤ 6%

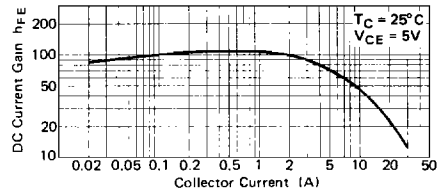
2SC1043, 2SA1044

DC CURRENT GAIN



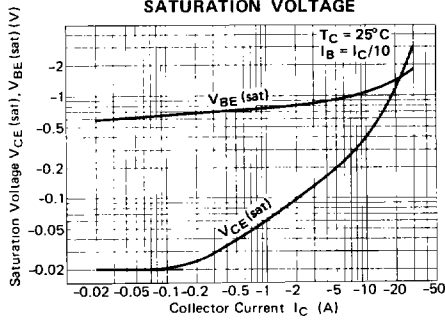
2SC2433, 2SC2434

DC CURRENT GAIN

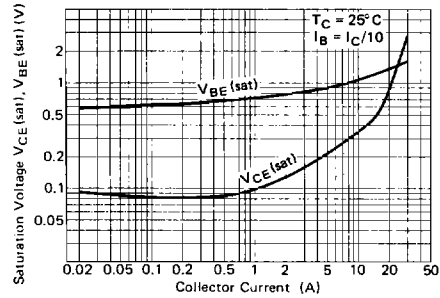


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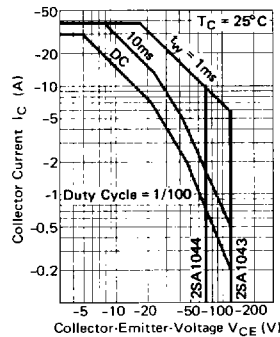
SATURATION VOLTAGE



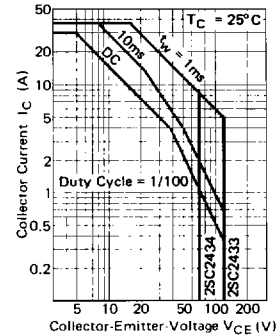
SATURATION VOLTAGE



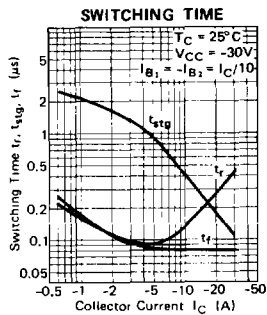
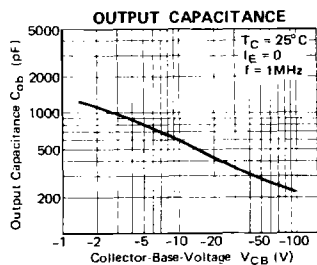
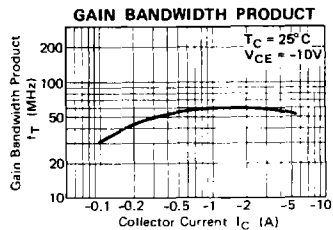
SAFE OPERATING AREAS



SAFE OPERATING AREAS



2SA 1043, 2SA1044



2SC2433, 2SC2434

