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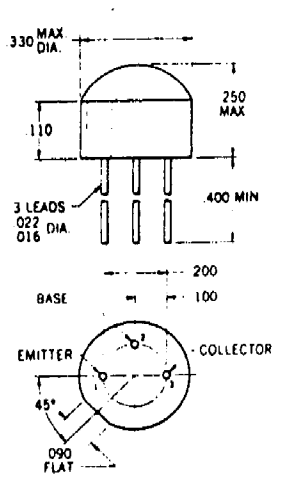
2N3638 – 2N3638A

PNP High Current Switches

Diffused Silicon Planar* Epitaxial Transistors

- **FAST SWITCHING** - - t_{on} = 75 ns (max.) @ 300 mA
  - - t_{off} = 170 ns (max.) @ 300 mA
- **HIGH BETA** - - h_{FE} 100 (min.) @ I_C = 50 mA
- **HIGH CURRENT** - - Up to 500 mA
- **LOW V_{CE}(sat)** - - 1.0 Volt (max.) @ 300 mA
- **LOW COST IN ALL QUANTITIES**

PHYSICAL DIMENSIONS



ABSOLUTE MAXIMUM RATINGS (Note 1)

Maximum Temperatures		
Storage Temperature		−55°C to +125°C
Operating Junction Temperature		+125°C Maximum
Lead Temperature (Soldering, 10 sec time limit)		+260°C Maximum
Maximum Power Dissipation		
Total Dissipation at 25°C Case Temperature	(Notes 2 and 3)	0.7 Watt
at 25°C Free Air Temperature	(Notes 2 and 3)	0.3 Watt
Maximum Voltages and Current		
V_{CBO} Collector to Base Voltage		−25 Volts
V_{CES} Collector to Emitter Voltage		−25 Volts
V_{CEO} Collector to Emitter Voltage	(Note 4)	−25 Volts
V_{EBO} Emitter to Base Voltage		−4.0 Volts
I_C Collector Current	(Note 2)	500 mA

ELECTRICAL CHARACTERISTICS (25°C Free Air Temperature unless otherwise noted)

SYMBOL	CHARACTERISTIC	2N3638 MIN.	2N3638 TYP.	2N3638 MAX.	2N3638A MIN.	2N3638A TYP.	2N3638A MAX.	UNITS	TEST CONDITIONS	
h_{FE}	DC Pulse Current Gain (Note 5)				80	140			I_C = 1.0 mA	V_{CE} = −10V
h_{FE}	DC Pulse Current Gain (Note 5)	20	70		100	160			I_C = 10 mA	V_{CE} = −10V
h_{FE}	DC Pulse Current Gain (Note 5)	30	67		100	130			I_C = 50 mA	V_{CE} = −1.0 V
h_{FE}	DC Pulse Current Gain (Note 5)	20	40		20	50			I_C = 300 mA	V_{CE} = −2.0 V
V_{CE}(sat)	Pulsed Collector Saturation Voltage (Note 5)		−0.08	−0.25		−0.08	−0.25	Volt	I_C = 50 mA	I_B = 2.5 mA
V_{CE}(sat)	Pulsed Collector Saturation Voltage (Note 5)		−0.38	−1.0		−0.38	−1.0	Volt	I_C = 300 mA	I_B = 30 mA
V_{CEO}(sust)	Collector to Emitter Sustaining Voltage (Notes 4 & 5)	−25			−25			Volts	I_C = 10 mA (pulsed)	I_B = 0
BV_{CBO}	Collector to Base Breakdown Voltage	−25			−25			Volts	I_C = 100 μA	I_E = 0
BV_{CES}	Collector to Emitter Breakdown Voltage	−25			−25			Volts	I_C = 100 μA	V_{EB} = 0
t_{on}	Turn On Time (Note 6)		28	75		28	75	ns	I_C = 300 mA	I_{B1} = 30 mA
t_{off}	Turn Off Time (Note 6)		110	170		110	170	ns	I_C = 300 mA	I_{B1} = 30 mA I_{B2} = −30 mA
h_{fe}	High Frequency Current Gain (f = 100 MHz)	1.0	1.9		1.5	1.9			I_C = 50 mA	V_{CE} = −3.0 V
C_{obo}	Common-Base, Open-Circuit Output Capacitance		6.0	20		6.0	10	pF	I_E = 0	V_{CB} = −10 V
C_{ibo}	Common-Base, Open-Circuit Input Capacitance		18	65		18	25	pF	I_C = 0	V_{EB} = −0.5 V

ELECTRICAL CHARACTERISTICS (25°C Free Air Temperature unless otherwise noted)

SYMBOL	CHARACTERISTIC	MIN.	TYP.	MAX.	UNITS	TEST CONDITIONS	
V_{BE}(sat)	Base-Emitter Saturation Voltage (pulsed, Note 5)		−0.9	−1.1	Volts	I_C = 50 mA	I_B = 2.5 mA
V_{BE}(sat)	Base-Emitter Saturation Voltage (pulsed, Note 5)	−0.8	−1.25	−2.0	Volts	I_C = 300 mA	I_B = 30 mA
BV_{EBO}	Emitter to Base Breakdown Voltage	−4.0			Volts	I_E = 100 μA	I_C = 0
I_{CES}	Collector Reverse Current		0.1	35	nA	V_{CE} = −15 V	V_{EB} = 0
I_{CES}(65°C)	Collector Reverse Current		0.002	2.0	μA	V_{CE} = −15 V	V_{EB} = 0