

# Silicon Dual NPN Transistor

## **MD918AF**

High Frequency Transistor

30V / 50mA

# DATASHEET

OEM –Motorola

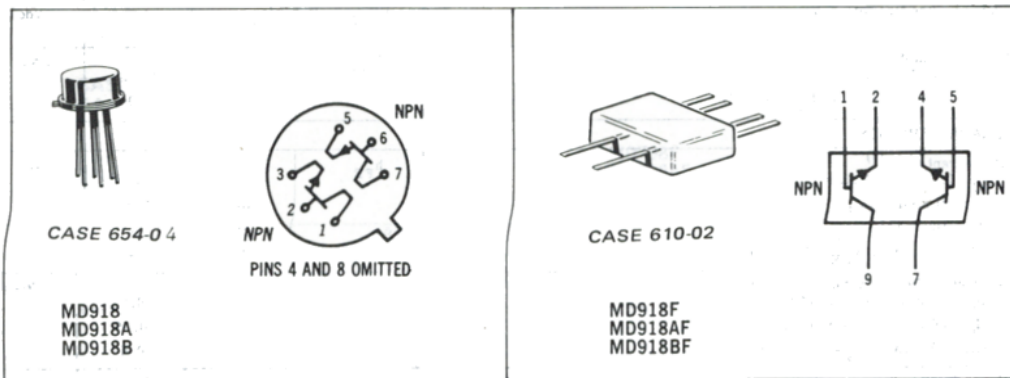
Source: Motorola Databook 1972

# MD918, F (SILICON)

## MD918A, F

## MD918B, F

Dual NPN silicon annular transistors designed for ultra-high frequency oscillator and amplifier applications and for differential amplifier applications requiring a matched pair of transistors with a high degree of parameter uniformity under varying environmental conditions.



Pin Connections, Bottom View  
All Leads Electrically Isolated from Case

### MAXIMUM RATINGS (each side) (T<sub>A</sub> = 25°C unless otherwise noted)

Rating	Symbol	Value	Unit
Collector-Emitter Voltage	V <sub>CEO</sub>	15	Vdc
Collector-Base Voltage	V <sub>CB</sub>	30	Vdc
Emitter-Base Voltage	V <sub>EB</sub>	5.0	Vdc
Collector Current	I <sub>C</sub>	50	mAdc
Operating and Storage Junction Temperature Range	T <sub>J</sub> , T <sub>stg</sub>	-65 to +200	°C
Total Device Dissipation @ T <sub>A</sub> = 25°C	P <sub>D</sub>	One Side	Both Sides
		300 1.7	400 2.3
Metal Can Derate above 25°C			mW mW/°C
Flat Package Derate above 25°C		250 1.5	350 2.0
			mW mW/°C

**MD918,F/MD918A,F/MD918B,F** (continued)**ELECTRICAL CHARACTERISTICS** (each side) ( $T_A = 25^\circ\text{C}$  unless otherwise noted)

Characteristic	Symbol	Min	Max	Unit
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**OFF CHARACTERISTICS**

Collector-Emitter Breakdown Voltage ( $I_C = 3 \text{ mAdc}$ , $I_B = 0$ )	$BV_{CEO}$	15	—	Vdc
Collector-Base Breakdown Voltage ( $I_C = 1 \mu\text{Adc}$ , $I_E = 0$ )	$BV_{CBO}$	30	—	Vdc
Emitter-Base Breakdown Voltage ( $I_E = 10 \mu\text{Adc}$ , $I_C = 0$ )	$BV_{EBO}$	5.0	—	Vdc
Collector Cutoff Current ( $V_{CB} = 15 \text{ Vdc}$ , $I_E = 0$ ) ( $V_{CB} = 15 \text{ Vdc}$ , $I_E = 0$ , $T_A = 150^\circ\text{C}$ )	$I_{CBO}$	— —	0.010 1.0	$\mu\text{Adc}$

**ON CHARACTERISTICS**

DC Current Gain ( $I_C = 1 \text{ mAdc}$ , $V_{CE} = 5 \text{ Vdc}$ )	$h_{FE}$	50	—	—
Collector-Emitter Saturation Voltage ( $I_C = 10 \text{ mAdc}$ , $I_B = 1 \text{ mAdc}$ )	$V_{CE(sat)}$	—	0.2	Vdc
Base-Emitter Saturation Voltage ( $I_C = 10 \text{ mAdc}$ , $I_B = 1 \text{ mAdc}$ )	$V_{BE(sat)}$	—	0.9	Vdc

**DYNAMIC CHARACTERISTICS**

Current-Gain-Bandwidth Product ( $I_C = 4 \text{ mAdc}$ , $V_{CE} = 10 \text{ Vdc}$ , $f = 100 \text{ MHz}$ )	$f_T$	600	—	MHz
Output Capacitance ( $V_{CB} = 10 \text{ Vdc}$ , $I_E = 0$ , $f = 140 \text{ kHz}$ ) ( $V_{CB} = 0$ , $I_E = 0$ , $f = 140 \text{ kHz}$ )	$C_{ob}$	— —	1.7 3.0	pF
Input Capacitance ( $V_{BE} = 0.5 \text{ Vdc}$ , $I_C = 0$ , $f = 140 \text{ kHz}$ )	$C_{ib}$	—	2.0	pF
Noise Figure ( $I_C = 1 \text{ mAdc}$ , $V_{CE} = 6 \text{ Vdc}$ , $f = 60 \text{ MHz}$ , $R_S = 400 \text{ ohms}$ )	NF	—	6.0	dB

**MATCHING CHARACTERISTICS**

DC Current Gain Ratio* ( $I_C = 1 \text{ mAdc}$ , $V_{CE} = 5 \text{ Vdc}$ )	MD918A, MD918AF MD918B, MD918BF	$h_{FE1}/h_{FE2}^*$	0.9 0.8	1.0 1.0	—
Base Voltage Differential ( $I_C = 1 \text{ mAdc}$ , $V_{CE} = 5 \text{ Vdc}$ )	MD918A, MD918AF MD918B, MD918BF	$ V_{BE1} - V_{BE2} $	— —	5.0 10	mVdc
Base Voltage Differential Change ( $I_C = 1 \text{ mAdc}$ , $V_{CE} = 5 \text{ Vdc}$ , $T_A = -55 \text{ to } +125^\circ\text{C}$ )	MD918A, MD918AF MD918B, MD918BF	$\frac{\Delta(V_{BE1} - V_{BE2})}{\Delta T_A}$	— —	10 20	$\mu\text{V}/^\circ\text{C}$

\*The lowest  $h_{FE}$  reading is taken as  $h_{FE1}$  for this ratio.