

2C918HV Chip

NPN Silicon

Small-Signal Transistor

...designed for VHF operation in tuned amplifier/oscillator applications.

- Small-Signal Power Gain — 15 dB Min @ 200 MHz
- Noise Figure — 6.0 dB Max @ 60 MHz



MAXIMUM RATINGS			
Rating	Symbol	Value	Unit
Collector-Emitter Voltage	V _{CEO}	15	Vdc
Collector-Base Voltage	V _{CBO}	30	Vdc
Emitter-Base Voltage	V _{EBO}	3.0	Vdc
Collector Current	I _C	50	mAdc
Power Dissipation @ T _A = 25°C Derate above 25°C	P _D	200 1.14	mW mW/°C
Storage and Junction Temperature Range	T _{stg} , T _J	-65 to +200	°C

ELECTRICAL CHARACTERISTICS (T _A = 25°C unless otherwise noted.)				
Characteristic	Symbol	Min	Max	Unit
OFF CHARACTERISTICS				
Collector-Emitter Breakdown Voltage* (I _C = 3.0 mAdc)	V _{(BR)CEO}	15	—	Vdc
Collector-Base Breakdown Voltage (I _C = 1.0 μAdc)	V _{(BR)CBO}	30	—	Vdc
Emitter-Base Breakdown Voltage (I _C = 10 μAdc)	V _{(BR)EBO}	3.0	—	Vdc
Collector Cutoff Current (V _{CB} = 25 Vdc) (V _{CB} = 25 Vdc, T _A = 150°C)	I _{CBO}	—	10 1.0	nAdc μAdc
Emitter Cutoff Current (V _{EB} = 2.5 Vdc)	I _{EBO}	—	10	nAdc

* Pulsed. Pulse Width 250 to 350 μs, Duty Cycle 1.0 to 2.0%.

(continued)

Physical Characteristics:

Die Size — 10 x 15 mils

Die Thickness — 4-8 mils

Bond Pad Size:
Emitter — 2.0 x 4.0 mils
Base — 2.0 x 4.0 mils

Back Metal
20 kÅ Gold (Nom)

Top Metal
15 kÅ Alum. (Nom)

Back Side = Collector

2C918HV

ELECTRICAL CHARACTERISTICS — continued ($T_A = 25^\circ\text{C}$ unless otherwise noted.)				
Characteristic	Symbol	Min	Max	Unit
ON CHARACTERISTICS				
DC Current Gain ($I_C = 500 \mu\text{A}$, $V_{CE} = 10 \text{ Vdc}$) ($I_C = 3.0 \text{ mA}$, $V_{CE} = 1.0 \text{ Vdc}$) ($I_C = 10 \text{ mA}$, $V_{CE} = 10 \text{ Vdc}$) ($I_C = 3.0 \text{ mA}$, $V_{CE} = 1.0 \text{ Vdc}$, $T_A = -55^\circ\text{C}$)	h_{FE}	10 20 20 10	— 200 — —	—
Collector–Emitter Saturation Voltage ($I_C = 10 \text{ mA}$, $I_B = 1.0 \text{ mA}$)	$V_{CE(sat)}$	—	0.4	Vdc
Base–Emitter Saturation Voltage ($I_C = 10 \text{ mA}$, $I_B = 1.0 \text{ mA}$)	$V_{BE(sat)}$	—	1.0	Vdc
SMALL–SIGNAL CHARACTERISTICS				
Small–Signal Current Transfer Ratio, Magnitude ($I_C = 4.0 \text{ mA}$, $V_{CE} = 10 \text{ Vdc}$, $f = 100 \text{ MHz}$)	$ h_{fe} $	6.0	18	—
Output Capacitance ($V_{CB} = 0$, $f = 100 \text{ kHz} - 1.0 \text{ MHz}$) ($V_{CB} = 10 \text{ Vdc}$, $f = 100 \text{ kHz} - 1.0 \text{ MHz}$)	C_{obo}	— —	3.0 1.7	pF
Input Capacitance ($V_{EB} = 0.5 \text{ Vdc}$, $f = 100 \text{ kHz} - 1.0 \text{ MHz}$)	C_{ibo}	—	2.0	pF
Noise Figure ($V_{CE} = 6.0 \text{ Vdc}$, $I_C = 1.0 \text{ mA}$, $f = 60 \text{ MHz}$)	NF	—	6.0	dB
FUNCTIONAL TESTS ($V_{CC} = 28 \text{ Vdc}$, $f = 400 \text{ MHz}$)				
Collector–Base Time Constant ($V_{CB} = 10 \text{ Vdc}$, $I_E = -4.0 \text{ mA}$, $f = 79.8 \text{ MHz}$)	t_b/C_c	—	25	ps
Power Gain, Tuned Circuit Power Gain ($V_{CB} = 12 \text{ Vdc}$, $I_C = 6.0 \text{ mA}$, $f = 200 \text{ MHz}$)	G_{pe}	15	—	dB
Tuned Oscillator Power Output ($V_{CB} = 15 \text{ Vdc}$, $I_C = 8.0 \text{ mA}$, $f = 500 \text{ MHz}$)	P_o	30	—	mW
Collector Efficiency	η	25	—	%


ASSURANCE TESTING (Pre/Post Burn–In)				
Characteristics Tested	Symbol	Initial and End Point Limits		Unit
		Min	Max	
Collector Cutoff Current ($V_{CB} = 25 \text{ Vdc}$)	I_{CBO}	—	10	nA
DC Current Gain ($I_C = 3.0 \text{ mA}$, $V_{CE} = 1.0 \text{ Vdc}$)	h_{FE}	20	200	—

Delta from Pre–Burn–In Measured Values				
Delta	Symbol	Initial and End Point Limits		Unit
		Min	Max	
Delta Collector Cutoff Current	ΔI_{CBO}	—	± 100 or ± 5.0 whichever is greater	% of Initial Value nA
Delta DC Current Gain	Δh_{FE}	—	± 20	% of Initial Value

ARCHIVE DOCUMENT - NOT FOR NEW DESIGN

This page intentionally left blank.

PROTOTYPE DOCUMENT - NOT FOR NEW DESIGN

Motorola reserves the right to make changes without further notice to any products herein. Motorola makes no warranty, representation or guarantee regarding the suitability of its products for any particular purpose, nor does Motorola assume any liability arising out of the application or use of any product or circuit, and specifically disclaims any and all liability, including without limitation consequential or incidental damages. "Typical" parameters can and do vary in different applications. All operating parameters, including "Typicals" must be validated for each customer application by customer's technical experts. Motorola does not convey any license under its patent rights nor the rights of others. Motorola products are not designed, intended, or authorized for use as components in systems intended for surgical implant into the body, or other applications intended to support or sustain life, or for any other application in which the failure of the Motorola product could create a situation where personal injury or death may occur. Should Buyer purchase or use Motorola products for any such unintended or unauthorized application, Buyer shall indemnify and hold Motorola and its officers, employees, subsidiaries, affiliates, and distributors harmless against all claims, costs, damages, and expenses, and reasonable attorney fees arising out of, directly or indirectly, any claim of personal injury or death associated with such unintended or unauthorized use, even if such claim alleges that Motorola was negligent regarding the design or manufacture of the part. Motorola and  are registered trademarks of Motorola, Inc. Motorola, Inc. is an Equal Opportunity/Affirmative Action Employer.

Literature Distribution Centers:

USA: Motorola Literature Distribution; P.O. Box 20912; Phoenix, Arizona 85036.

EUROPE: Motorola Ltd.; European Literature Centre; 88 Tanners Drive, Blakelands, Milton Keynes, MK14 5BP, England.

JAPAN: Nippon Motorola Ltd.; 4-32-1, Nishi-Gotanda, Shinagawa-ku, Tokyo 141, Japan.

ASIA PACIFIC: Motorola Semiconductors H.K. Ltd.; Silicon Harbour Center, No. 2 Dai King Street, Tai Po Industrial Estate, Tai Po, N.T., Hong Kong.

