

**MD2484FH XV (DUAL)  
 MHQ2484HX, HXV (QUAD)  
 MQ2484HXV (QUAD)**

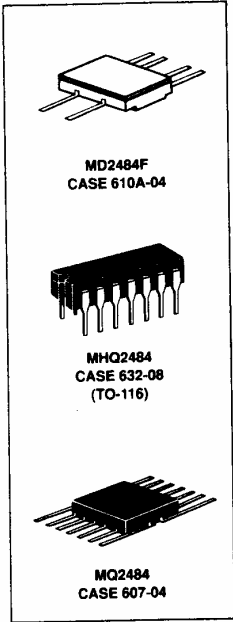
**CRYSTALONCS**  
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**NPN Silicon Dual/Quad  
 Small-Signal Transistors**

... designed for general-purpose amplifier applications.

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MAXIMUM RATINGS				
Rating	Symbol	Value		Unit
Collector-Emitter Voltage	V <sub>CEO</sub>	60		Vdc
Collector-Base Voltage	V <sub>CBO</sub>	60		Vdc
Emitter-Base Voltage	V <sub>EBO</sub>	6.0		Vdc
Collector Current — Continuous	I <sub>C</sub>	50		mAdc
		One Die	All Die Equal Power	
Device Dissipation @ T <sub>A</sub> = 25°C	P <sub>T</sub>			Watts
MD2484F		0.35	0.4	
MHQ2484		0.6	1.8	
MQ2484		0.4	0.6	
Derate above 25°C				mW/°C
MD2484F		2.0	2.28	
MHQ2484		3.42	10.3	
MQ2484		2.28	3.42	
@ T <sub>C</sub> = 25°C				Watts
MD2484F		1.0	2.0	
MHQ2484		1.2	4.2	
MQ2484		0.9	3.6	
Derate above 25°C				mW/°C
MD2484F		5.7	11.4	
MHQ2484		6.85	24	
MQ2484		5.13	20.5	
Operating Junction and Storage Temperature Range	T <sub>J</sub> , T <sub>stg</sub>	-65 to 200		°C



ELECTRICAL CHARACTERISTICS (T <sub>A</sub> = 25°C unless otherwise noted.)				
Characteristic	Symbol	Min	Max	Unit
<b>OFF CHARACTERISTICS</b>				
Collector-Emitter Breakdown Voltage <sup>(1)</sup> (I <sub>C</sub> = 10 mA, I <sub>B</sub> = 0)	V <sub>(BR)CEO</sub>	60	—	Vdc
Collector-Base Breakdown Voltage (I <sub>C</sub> = 10 μA, I <sub>E</sub> = 0)	V <sub>(BR)CBO</sub>	60	—	Vdc
Emitter-Base Breakdown Voltage (I <sub>E</sub> = 10 μA, I <sub>C</sub> = 0)	V <sub>(BR)EBO</sub>	6.0	—	Vdc
Collector Cutoff Current (V <sub>CB</sub> = 45 Vdc, I <sub>E</sub> = 0) (V <sub>CB</sub> = 45 Vdc, I <sub>E</sub> = 0, T <sub>A</sub> = 150°C)	I <sub>CBO</sub>	— —	0.005 10	μA
Collector Cutoff Current (V <sub>CE</sub> = 5.0 Vdc, I <sub>E</sub> = 0)	I <sub>CEO</sub>	—	0.002	μA
Collector Cutoff Current (V <sub>CE</sub> = 45 Vdc, I <sub>E</sub> = 0)	I <sub>CES</sub>	—	0.005	μA
Emitter Cutoff Current (V <sub>BE</sub> = 5.0 Vdc, I <sub>C</sub> = 0)	I <sub>EBO</sub>	—	0.002	μA
<b>ON CHARACTERISTICS</b>				
DC Current Gain <sup>(1)</sup> (I <sub>C</sub> = 1.0 μA, V <sub>CE</sub> = 5.0 Vdc) (I <sub>C</sub> = 10 μA, V <sub>CE</sub> = 5.0 Vdc) (I <sub>C</sub> = 100 μA, V <sub>CE</sub> = 5.0 Vdc) (I <sub>C</sub> = 100 μA, V <sub>CE</sub> = 5.0 Vdc) (I <sub>C</sub> = 500 μA, V <sub>CE</sub> = 5.0 Vdc) (I <sub>C</sub> = 1.0 mA, V <sub>CE</sub> = 5.0 Vdc) (I <sub>C</sub> = 10 mA, V <sub>CE</sub> = 5.0 Vdc) (I <sub>C</sub> = 10 μA, V <sub>CE</sub> = 5.0 Vdc, T <sub>A</sub> = -55°C)	h <sub>FE</sub>	45 200 225 250 250 225 35	— 500 675 800 800 800 —	—
Collector-Emitter Voltage (I <sub>C</sub> = 1.0 mA, I <sub>B</sub> = 0.1 mA)	V <sub>CE(sat)</sub>	—	0.3	Vdc
Base-Emitter Saturation Voltage (I <sub>C</sub> = 0.1 mA, V <sub>CE</sub> = 5.0 Vdc)	V <sub>BE</sub>	0.5	0.7	Vdc
<b>SMALL-SIGNAL CHARACTERISTICS</b>				
Collector-Base Capacitance (V <sub>CB</sub> = 5.0 Vdc, I <sub>E</sub> = 0, f = 0.1 to 1.0 MHz)	C <sub>obo</sub>	—	5.0	pF
Input Capacitance (V <sub>BE</sub> = 0.5 Vdc, I <sub>C</sub> = 0, f = 0.1 to 1.0 MHz)	C <sub>ibo</sub>	—	6.0	pF
DC Current Gain (I <sub>C</sub> = 1.0 mA, V <sub>CE</sub> = 5.0 Vdc, f = 1.0 kHz)	h <sub>fe</sub>	250	900	—
Small-Signal Current Transfer Ratio, Magnitude (I <sub>C</sub> = 50 μA, V <sub>CE</sub> = 5.0 Vdc, f = 5.0 MHz) (I <sub>C</sub> = 500 μA, V <sub>CE</sub> = 5.0 Vdc, f = 30 MHz)	h <sub>fe</sub>	3.0 2.0	— 7.0	—
Input Impedance (I <sub>C</sub> = 1.0 mA, V <sub>CE</sub> = 5.0 Vdc, f = 0.1 to 1.0 kHz)	h <sub>ie</sub>	3.5	24	kohms
Voltage Feedback Ratio (I <sub>C</sub> = 1.0 mA, V <sub>CE</sub> = 5.0 Vdc, f = 1.0 kHz)	h <sub>re</sub>	0	8.0	X 10 <sup>-4</sup>
Output Admittance (I <sub>C</sub> = 1.0 mA, V <sub>CE</sub> = 5.0 Vdc, f = 1.0 kHz)	h <sub>oe</sub>	0	40	μohms

ELECTRICAL CHARACTERISTICS — continued (T <sub>A</sub> = 25°C unless otherwise noted.)				
Characteristic	Symbol	Min	Max	Unit
<b>SMALL-SIGNAL CHARACTERISTICS (continued)</b>				
Noise Figure, R <sub>G</sub> = 10 kohm (I <sub>C</sub> = 10 μA, V <sub>CE</sub> = 5.0 Vdc, f = 100 Hz) (I <sub>C</sub> = 10 μA, V <sub>CE</sub> = 5.0 Vdc, f = 1.0 kHz) (I <sub>C</sub> = 10 μA, V <sub>CE</sub> = 5.0 Vdc, f = 10 kHz) (I <sub>C</sub> = 10 mA, V <sub>CE</sub> = 5.0 Vdc, f = 10 Hz to 15.7 kHz)	NF	— — — —	7.5 3.0 2.0 3.0	dB

ASSURANCE TESTING (Pre/Post Burn-In)				
Characteristics Tested	Symbol	Initial and End Point Limits		Unit
		Min	Max	
Collector Cutoff Current (V <sub>CB</sub> = 45 Vdc)	I <sub>CBO</sub>	—	5.0	μA
DC Current Gain <sup>(1)</sup> (I <sub>C</sub> = 500 μA, V <sub>CE</sub> = 5.0 Vdc)	h <sub>FE</sub>	250	800	—

Delta from Pre-Burn-In Measured Values		Min	Max	
Delta Collector Cutoff Current	ΔI <sub>CBO</sub>	—	±100 or ±2.0 whichever is greater	% of Initial Value nA
Delta DC Current Gain <sup>(1)</sup>	Δh <sub>FE</sub>	—	±25	% of Initial Value

(1) Pulsed. Pulse Width ≤ 300 μs. Duty Cycle 2.0%.