

**MD6002HX, HXV (DUAL)
MD6002FHXV (DUAL)
MHQ6002HX, HXV (QUAD)
MQ6002HXV (QUAD)**

CRYSTALONCS
2805 Veterans Highway
Suite 14
Ronkonkoma, N.Y. 11779

**Dual/Quad
NPN/PNP Complementary Pairs
Small-Signal Transistors**

... designed for general-purpose amplifier and switching applications.

MAXIMUM RATINGS				
Rating	Symbol	Value		Unit
Collector-Emitter Voltage	V _{CEO}	30		V _{dc}
Collector-Base Voltage	V _{CBO}	60		V _{dc}
Emitter-Base Voltage	V _{EBO}	5.0		V _{dc}
Collector Current — Continuous	I _C	500		mA _{dc}
		Each Transistor	Total Device	
Device Dissipation @ T _A = 25°C	P _T			Watts
MD6002		0.575	0.625	
MD6002F		0.35	0.4	
MHQ6002		0.65	1.9	
MQ6002		0.4	0.6	
Derate above 25°C				mW/°C
MD6002		3.25	3.57	
MD6002F		2.0	2.28	
MHQ6002		3.72	10.88	
MQ6002		2.28	3.42	
@ T _C = 25°C				Watts
MD6002		1.8	3.57	
MD6002F		1.0	2.28	
MHQ6002		1.3	10.88	
MQ6002		0.9	3.6	
Derate above 25°C				mW/°C
MD6002		10.3	14.3	
MD6002F		5.71	11.4	
MHQ6002		7.43	26.3	
MQ6002		5.13	20.15	
Operating Junction and Storage Temperature Range	T _J , T _{stg}	-65 to 200		°C



**MD6002
CASE 654-07
(TO-78)**



**MD6002F
CASE 610A-04**



**MQ6002
CASE 607-04**



**MHQ6002
CASE 632-08
(TO-118)**

ELECTRICAL CHARACTERISTICS ($T_A = 25^\circ\text{C}$ unless otherwise noted.)				
Characteristic	Symbol	Min	Max	Unit
OFF CHARACTERISTICS				
Collector-Emitter Breakdown Voltage ⁽¹⁾ ($I_C = 10\text{ mA}$, $I_B = 0$)	$V_{(BR)CEO}$	30	—	Vdc
Collector-Base Breakdown Voltage ($I_C = 10\text{ }\mu\text{A}$, $I_E = 0$)	$V_{(BR)CBO}$	60	—	Vdc
Emitter-Base Breakdown Voltage ($I_E = 10\text{ }\mu\text{A}$, $I_C = 0$)	$V_{(BR)EBO}$	5.0	—	Vdc
Collector Cutoff Current ($V_{CB} = 50\text{ Vdc}$, $I_E = 0$)	I_{CBO}	—	0.02	μA
Emitter Cutoff Current ($V_{BE} = 3.0\text{ Vdc}$, $I_C = 0$)	I_{EBO}	—	0.03	μA
ON CHARACTERISTICS				
DC Current Gain ⁽¹⁾ ($I_C = 1.0\text{ mA}$, $V_{CE} = 10\text{ Vdc}$) ($I_C = 10\text{ mA}$, $V_{CE} = 10\text{ Vdc}$) ($I_C = 150\text{ mA}$, $V_{CE} = 10\text{ Vdc}$) ($I_C = 300\text{ mA}$, $V_{CE} = 10\text{ Vdc}$)	h_{FE}	50 75 100 30	— — 300 —	—
Collector-Emitter Saturation Voltage ($I_C = 150\text{ mA}$, $I_B = 15\text{ mA}$) ($I_C = 300\text{ mA}$, $I_B = 30\text{ mA}$)	$V_{CE(sat)}$	— —	0.4 1.4	Vdc
Base-Emitter Saturation Voltage ($I_C = 150\text{ mA}$, $I_B = 15\text{ mA}$) ($I_C = 300\text{ mA}$, $I_B = 30\text{ mA}$)	$V_{BE(sat)}$	— —	1.3 2.0	Vdc

ASSURANCE TESTING (Pre/Post Burn-In)				
Characteristics Tested	Symbol	Initial and End Point Limits		Unit
		Min	Max	
Collector Cutoff Current ($V_{CB} = 50\text{ Vdc}$)	I_{CBO}	—	20	nA
DC Current Gain ⁽¹⁾ ($I_C = 150\text{ mA}$, $V_{CE} = 10\text{ Vdc}$)	h_{FE}	100	300	—

Delta from Pre-Burn-In Measured Values		Min	Max	
Delta Collector Cutoff Current	ΔI_{CBO}	—	± 100 or ± 5.0 whichever is greater	% of Initial Value nA
Delta DC Current Gain ⁽¹⁾	Δh_{FE}	—	± 25	% of Initial Value

(1) Pulsed: Pulse Width $\leq 300\text{ }\mu\text{s}$, Duty Cycle $\leq 2.0\%$.