

6367254 MOTOROLA SC (XSTRS/R F)

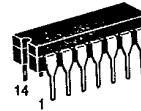
96D 82490 D

T-43-25

MAXIMUM RATINGS

Rating	Symbol	MHQ4013	MHQ4014	Unit
Collector-Emitter Voltage	V _{CEO}	40	45	V _{dc}
Collector-Emittter Voltage	V _{CES}	60	70	V _{dc}
Collector-Base Voltage	V _{CBO}	60	70	V _{dc}
Emitter-Base Voltage	V _{EBO}	6.0		V _{dc}
Collector Current — Continuous	I _C	1.5		Adc
		Each Transistor	Four Transistors Equal Power	
Total Device Dissipation @ T _A = 25°C Derate above 25°C	P _D	750 4.3	2500 14.3	mW mW/°C
Total Device Dissipation @ T _C = 25°C Derate above 25°C	P _D	1.2 6.86	4.0 22.8	Watts mW/°C
Operating and Storage Junction Temperature Range	T _J , T _{stg}	-55 to +200		°C

MHQ4013
MHQ4014

CASE 632-02, STYLE 1
TO-116

QUAD
MEMORY DRIVER TRANSISTOR

NPN SILICON

Refer to MD3725 for graphs.

ELECTRICAL CHARACTERISTICS (T_A = 25°C unless otherwise noted.)

Characteristic	Symbol	Min	Typ	Max	Unit
OFF CHARACTERISTICS					
Collector-Emitter Breakdown Voltage(1) (I _C = 10 mA _{dc} , I _B = 0)	MHQ4013 MHQ4014 V _{(BR)CEO}	40 45	— —	— —	V _{dc}
Collector-Emitter Breakdown Voltage (I _C = 10 μA _{dc} , V _{BE} = 0)	MHQ4013 MHQ4014 V _{(BR)CES}	60 70	— —	— —	V _{dc}
Collector-Base Breakdown Voltage (I _C = 10 μA _{dc} , I _E = 0)	MHQ4013 MHQ4014 V _{(BR)CBO}	60 70	— —	— —	V _{dc}
Emitter-Base Breakdown Voltage (I _E = 10 μA _{dc} , I _C = 0)	V _{(BR)EBO}	6.0	—	—	V _{dc}
Collector Cutoff Current (V _{CB} = 50 V _{dc} , I _E = 0)	I _{CBO}	—	—	500	nA _{dc}
ON CHARACTERISTICS(1)					
DC Current Gain (I _C = 100 mA _{dc} , V _{CE} = 1.0 V _{dc}) (I _C = 500 mA _{dc} , V _{CE} = 1.0 V _{dc}) (I _C = 1.0 A _{dc} , V _{CE} = 5.0 V _{dc})	h _{FE}	60 35 25	100 65 50	250 — —	—
Collector-Emitter Saturation Voltage (I _C = 100 mA _{dc} , I _B = 10 mA _{dc}) (I _C = 500 mA _{dc} , I _B = 50 mA _{dc}) (I _C = 1.0 A _{dc} , I _B = 100 mA _{dc})	V _{CE(sat)}	— — —	0.14 0.23 0.36	0.26 0.52 0.95	V _{dc}
Base-Emitter Saturation Voltage (I _C = 100 mA _{dc} , I _B = 10 mA _{dc}) (I _C = 500 mA _{dc} , I _B = 50 mA _{dc}) (I _C = 1.0 A _{dc} , I _B = 100 mA _{dc})	V _{BE(sat)}	— 0.8 —	0.75 0.88 1.0	0.86 1.1 1.7	V _{dc}
SMALL-SIGNAL CHARACTERISTICS					
Current-Gain — Bandwidth Product(1) (I _C = 50 mA _{dc} , V _{CE} = 10 V _{dc} , f = 100 MHz)	f _T	200	275	—	MHz
Output Capacitance (V _{CB} = 10 V _{dc} , I _E = 0, f = 1 MHz)	C _{obo}	—	5.0	10	pF
Input Capacitance (V _{BE} = 0.5 V _{dc} , I _C = 0, f = 1 MHz)	C _{ibo}	—	50	70	pF
SWITCHING CHARACTERISTICS					
Turn-On Time (V _{CC} = 30 V _{dc} , I _C = 0.5 A _{dc} , V _{BE(off)} = 3.8 V _{dc} , I _{B1} = 50 mA _{dc})	t _{on}	—	20	35	ns
Turn-Off Time (V _{CC} = 30 V _{dc} , I _C = 0.5 A _{dc} , I _{B1} = I _{B2} = 50 mA _{dc})	t _{off}	—	50	60	ns

(1) Pulse Test: Pulse Width ≤ 300 μs, Duty Cycle ≤ 2.0%.

MOTOROLA SMALL-SIGNAL SEMICONDUCTORS

6367254 MOTOROLA SC (XSTRS/R F)
MHQ4013, MHQ4014

96D 82491 D

T-43-25

FIGURE 1 - TURN-ON AND TURN-OFF SWITCHING TIMES TEST CIRCUIT

