

MAXIMUM RATINGS

Rating	Symbol	Value		Unit	
Collector-Emitter Voltage	V _{CEO}	40		Vdc	
Collector-Base Voltage	V _{CBO}	50		Vdc	
Emitter-Base Voltage	V _{EBO}	5.0		Vdc	
Collector Current — Continuous	I _C	50		mAdc	
Total Device Dissipation @ T _A = 25°C	P _D	One Die	All Die Equal Power	mW	
		MD7021	550		600
		MD7021F	350		400
		MQ7021	400		600
Derate above 25°C					
MD7021	3.14	3.42	mW/°C		
MD7021F	2.0	2.28			
MQ7021	2.28	3.42			
Total Device Dissipation @ T _C = 25°C	P _D	One Die	All Die Equal Power	Watts	
		MD7021	1.4		2.0
		MD7021F	0.7		1.4
		MQ7021	0.7		2.8
Derate above 25°C					
MD7021	8.0	11.4	mW/°C		
MD7021F	4.0	8.0			
MQ7021	4.0	16			
Operating and Storage Junction Temperature Range	T _J , T _{stg}	-65 to +200		°C	

THERMAL CHARACTERISTICS

Characteristic	Symbol	One Die	All Die Equal Power	Unit	
Thermal Resistance, Junction to Case	R _{θJC}	MD7021	125	87.5	°C/W
		MD7021F	250	125	
		MQ7021	250	62.6	
Thermal Resistance, Junction to Ambient	R _{θJA} (1)	MD7021	319	292	°C/W
		MD7021F	500	438	
		MQ7021	438	292	
		Junction to Ambient	Junction to Case		
Coupling Factor		MD7021	83	40	%
		MD7021F	75	0	
		MQ7021 (Q1-Q2)	57	0	
		MQ7021 (Q1-Q3 or Q1-Q4)	55	0	

(1) R_{θJA} is measured with the device soldered into a typical printed circuit board.

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

Characteristic	Symbol	Min	Typ	Max	Unit
OFF CHARACTERISTICS					
Collector-Emitter Breakdown Voltage(2) (I _C = 10 mAdc, I _E = 0)	V _{(BR)CEO}	40	—	—	Vdc
Collector-Base Breakdown Voltage (I _C = 10 μAdc, I _E = 0)	V _{(BR)CBO}	50	—	—	Vdc
Emitter-Base Breakdown Voltage (I _E = 10 μAdc, I _C = 0)	V _{(BR)EBO}	5.0	—	—	Vdc
Collector Cutoff Current (V _{CB} = 30 Vdc, I _E = 0)	I _{CBO}	—	—	100	nAdc
ON CHARACTERISTICS					
DC Current Gain (I _C = 100 μAdc, V _{CE} = 10 Vdc) (I _C = 10 mAdc, V _{CE} = 10 Vdc)	h _{FE}	40 50	65 70	— —	—

**MD7021, F
MQ7021**

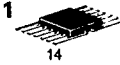
MD7021
CASE 654-07, STYLE 5
DUAL



MD7021F
CASE 610A-04, STYLE 1
DUAL

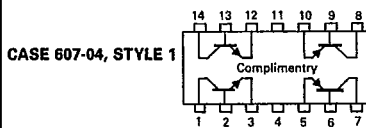
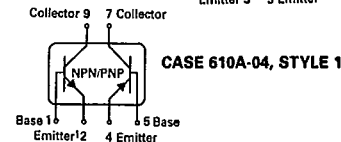
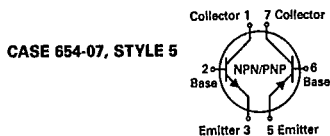


MQ7021
CASE 607-04, STYLE 1
QUAD



**COMPLEMENTARY
GENERAL PURPOSE
TRANSISTORS**
NPN/PNP SILICON

PIN CONNECTION DIAGRAMS



T-27-27

ELECTRICAL CHARACTERISTICS (continued) ($T_A = 25^\circ\text{C}$ unless otherwise noted.)

Characteristic	Symbol	Min	Typ	Max	Unit
Collector-Emitter Saturation Voltage ($I_C = 10 \text{ mAdc}$, $I_B = 1.0 \text{ mAdc}$)(2)	$V_{CE(sat)}$	—	—	0.35	Vdc
Base-Emitter Saturation Voltage ($I_C = 10 \text{ mAdc}$, $I_B = 1.0 \text{ mAdc}$)	$V_{BE(sat)}$	—	—	1.0	Vdc

SMALL-SIGNAL CHARACTERISTICS

Current-Gain — Bandwidth Product ($I_C = 5.0 \text{ mAdc}$, $V_{CE} = 20 \text{ Vdc}$, $f = 100 \text{ MHz}$)	f_T	200	320	—	MHz
Output Capacitance ($V_{CB} = 10 \text{ Vdc}$, $I_E = 0$, $f = 100 \text{ kHz}$)	C_{obo}	—	—	6.0	pF
Input Capacitance ($V_{BE} = 2.0 \text{ Vdc}$, $I_C = 0$, $f = 100 \text{ kHz}$)	C_{ibo}	—	—	8.0	pF

SWITCHING CHARACTERISTICS

Turn-On Time ($V_{CC} = 30 \text{ Vdc}$, $V_{BE(off)} = 0.5 \text{ Vdc}$, $I_C = 150 \text{ mAdc}$, $I_{B1} = 15 \text{ Adc}$)	t_{on}	—	28	—	ns
Turn-Off Time ($V_{CC} = 30 \text{ Vdc}$, $I_C = 150 \text{ mAdc}$, $I_{B1} = I_{B2} = 15 \text{ mAdc}$)	t_{off}	—	72	—	ns

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

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