

МСТ6Н, МСТ62Н

Vishay Semiconductors

Optocoupler, Phototransistor Output, Dual Channel



DESCRIPTION

The MCT6H and MCT62H consist of a phototransistor optically coupled to a gallium arsenide infrared emitting diode in a 6-lead plastic dual inline package. The elements are mounted on one leadframe, providing a fixed distance between input and output for highest safety requirements.

FEATURES

- Current transfer ratio (CTR) of typical 100 %
- Isolation test voltage V_{ISO} = 5300 V_{RMS}
- Low temperature coefficient of CTR
- Low coupling capacitance of typical 0.3 pF
- Wide ambient temperature range
- Lead (Pb)-free component
- Material categorization: for definitions of compliance please see <u>www.vishay.com/doc?99912</u>

APPLICATIONS

- · Galvanically separated circuits
- Non-interacting switches

AGENCY APPROVALS

• UL1577, file no. E76222 system code U, double protection

ORDER INFORMATION	
PART	REMARKS
MCT6H	CTR > 50 %, DIP-8
MCT62H	CTR > 100 %, DIP-8

Note

MCT6H and MCT62H are marked as MCT6 and MCT62 respectively.

ABSOLUTE MAXIMUM RATINGS (T _{amb} = 25 °C, unless otherwise specified)									
PARAMETER	TEST CONDITION	PART	SYMBOL	VALUE	UNIT				
INPUT									
Reverse voltage			V _R	6	V				
Forward current			١ _F	60	mA				
Forward surge current	t _p ≤ 10 μs		I _{FSM}	1.5	А				
Power dissipation			P _{diss}	100	mW				
Junction temperature			Tj	125	°C				
OUTPUT									
Collector emitter voltage			V _{CEO}	70	V				
Emitter collector voltage			V _{ECO}	7	V				
Collector current			Ι _C	50	mA				
Collector peak current	$t_p/T = 0.5, t_p \le 10 \text{ ms}$		I _{CM}	100	mA				
Power dissipation			P _{diss}	150	mW				
Junction temperature			Тj	125	°C				
COUPLER									
AC isolation test voltage (RMS)	t = 1.0 min		V _{ISO}	5000	V _{RMS}				
Total power dissipation			P _{tot}	250	mW				
Ambient temperature range			T _{amb}	- 55 to + 100	°C				
Storage temperature range			T _{stg}	- 55 to + 125	°C				
Soldering temperature ⁽²⁾	2 mm from case, t \leq 10 s		T _{sld}	260	°C				

Notes

(1) Stresses in excess of the absolute maximum ratings can cause permanent damage to the device. Functional operation of the device is not implied at these or any other conditions in excess of those given in the operational sections of this document. Exposure to absolute maximum ratings for extended periods of the time can adversely affect reliability.

(2) Refer to wave profile for soldering conditions for through hole devices.



RoHS

COMPLIANT



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ELECTRICAL CHARACTERISTICS (T _{amb} = 25 °C, unless otherwise specified)								
PARAMETER	TEST CONDITION	SYMBOL	MIN.	TYP.	MAX.	UNIT		
INPUT								
Forward voltage	I _F = 50 mA	V _F		1.25	1.6	V		
OUTPUT								
Collector emitter voltage	I _C = 1 mA	V _{CEO}	70			V		
Emitter collector voltage	I _E = 100 μA	V _{ECO}	7			V		
Collector dark current	$V_{CE} = 20 \text{ V}, I_F = 0, E = 0$	I _{CEO}			100	nA		
COUPLER								
DC isolation test voltage	t = 2 s	V _{ISO}	5000			V _{RMS}		
Isolation resistance	V _{IO} = 1000 V, 40 % relative humidity	R _{IO}		10 ¹²		Ω		
Collector emitter saturation voltage	I _F = 10 mA, I _C = 1 mA	V _{CEsat}			0.3	V		
Cut off frequency	$I_F = 10 \text{ mA}, V_{CE} = 5 \text{ V}, \\ R_L = 100 \ \Omega$	f _C		100		kHz		
Coupling capacitance	f = 1 MHz	C _k		0.3		pF		

Note

⁽¹⁾ Minimum and maximum values are testing requirements. Typical values are characteristics of the device and are the result of engineering evaluation. Typical values are for information only and are not part of the testing requirements.

CURRENT TRANSFER RATIO								
PARAMETER	TEST CONDITION	PART	SYMBOL	MIN.	TYP.	MAX.	UNIT	
I _C /I _F	$V_{CE} = 5 \text{ V}, I_F = 5 \text{ mA}$	MCT6H	CTR	50	100		%	
	$V_{CE} = 5 \text{ V}, I_F = 10 \text{ mA}$	MCT6H	CTR	60	120		%	
	$V_{CE} = 5 \text{ V}, I_F = 5 \text{ mA}$	MCT62H	CTR	100	200		%	

SWITCHING CHARACTERISTICS							
PARAMETER	TEST CONDITION	SYMBOL	MIN.	TYP.	MAX.	UNIT	
Delay time	$\label{eq:VS} \begin{array}{l} V_{S} = 5 \; V, \; I_{C} = 2 \; mA, \; R_{L} = 100 \; \Omega \\ (\text{see figure 1}) \end{array}$	t _d		3		μs	
Rise time	$\label{eq:VS} \begin{array}{l} V_{S} = 5 \; V, \; I_{C} = 2 \; mA, \; R_{L} = 100 \; \Omega \\ (\text{see figure 1}) \end{array}$	t _r		3		μs	
Fall time	$\label{eq:VS} \begin{array}{l} V_{S} = 5 \; V, \; I_{C} = 2 \; mA, \; R_{L} = 100 \; \Omega \\ (\text{see figure 1}) \end{array}$	t _f		4.7		μs	
Storage time	$\label{eq:VS} \begin{array}{l} V_{S} = 5 \; V, \; I_{C} = 2 \; mA, \; R_{L} = 100 \; \Omega \\ (\text{see figure 1}) \end{array}$	t _s		0.3		μs	
Turn-on time	$\label{eq:VS} \begin{array}{l} V_{S} = 5 \; V, \; I_{C} = 2 \; mA, \; R_{L} = 100 \; \Omega \\ (\text{see figure 1}) \end{array}$	t _{on}		6		μs	
Turn-off time	$V_{S} = 5 \text{ V}, \text{ I}_{C} = 2 \text{ mA}, \text{ R}_{L} = 100 \Omega$ (see figure 1)	t _{off}		5		μs	



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Fig. 1 - Test Circuit, non Saturated Operation

TYPICAL CHARACTERISTICS

T_{amb} = 25 °C, unless otherwise specified



Fig. 2 - Total Power Dissipation vs. Ambient Temperature



Fig. 2 - Forward Current vs. Forward Voltage

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Fig. 1 - Switching Times



Fig. 3 - Relative Current Transfer Ratio vs. Ambient Temperature



Fig. 4 - Collector Dark Current vs. Ambient Temperature

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I_F - Forward Current (mA)

Fig. 5 - Collector Current vs. Forward Current



Fig. 6 - Collector Current vs. Collector Emitter Voltage



Fig. 7 - Collector Emitter Saturation Voltage vs. Collector Current

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Fig. 8 - Current Transfer Ratio vs. Forward Current



Fig. 9 - Turn-on/Turn-off Time vs. Collector Current

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PACKAGE DIMENSIONS in inches (millimeters)





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