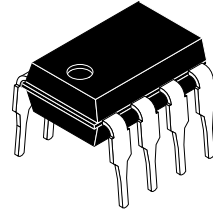


## Dual Channel Optocoupler with Phototransistor Output

### Description

The MCT6 and MCT62 consist of a phototransistor optically coupled to a gallium arsenide infrared emitting diode in a 6 lead plastic dual inline packages.

The elements are mounted on one leadframe in coplanar technique, providing a fixed distance between input and output for highest safety requirements.



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### Applications

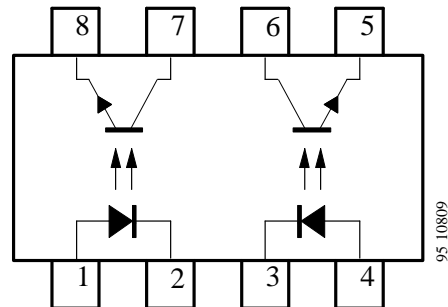
Galvanically separated circuits, non-interacting switches.



### Features

- Current Transfer Ratio (CTR) typical 100%
- DC isolation test voltage  $V_{IO} = 2.5 \text{ kV}$
- Low temperature coefficient of CTR
- Low coupling capacitance typical 0.3 pF
- Wide ambient temperature range
- UL recognized; file No. E 76222

### Pin Connection



## Absolute Maximum Ratings

### Input (Emitter)

Parameters	Test Conditions	Symbol	Value	Unit
Reserve voltage		$V_R$	6	V
Forward current		$I_F$	60	mA
Forward surge current	$t_p \leq 10 \mu s$	$I_{FSM}$	1.5	A
Power dissipation	$T_{amb} \leq 25^\circ C$	$P_V$	100	mW
Junction temperature		$T_j$	125	$^\circ C$

### Output (Detector)

Parameters	Test Conditions	Symbol	Value	Unit
Collector-emitter voltage		$V_{CEO}$	70	V
Emitter-collector voltage		$V_{ECO}$	7	V
Collector current		$I_C$	50	mA
Collector peak current	$t_p/T = 0.5, t_p \leq 10 ms$	$I_{CM}$	100	mA
Power dissipation	$T_{amb} \leq 25^\circ C$	$P_v$	150	mW
Junction temperature		$T_j$	125	$^\circ C$

### Coupler

Parameters	Test Conditions	Symbol	Value	Unit
DC isolation test voltage		$V_{IO}^{1)}$	2.5	kV
Total power dissipation	$T_{amb} \leq 25^\circ C$	$P_{tot}$	250	mW
Ambient temperature range		$T_{amb}$	-40 to +100	$^\circ C$
Storage temperature range		$T_{stg}$	-55 to +125	$^\circ C$
Soldering temperature	2 mm from case, $t \leq 10 s$	$T_{sd}$	260	$^\circ C$

1) Related to standard climate 23/50 DIN 50 014

## Electrical Characteristics

for single coupled system,  $T_{amb} = 25^{\circ}\text{C}$

### Input (Emitter)

Parameters	Test Conditions	Symbol	Min.	Typ.	Max.	Unit
Forward voltage	$I_F = 50 \text{ mA}$	$V_F$		1.25	1.6	V
Breakdown voltage	$I_R = 100 \mu\text{A}$	$V_{(BR)}$	5			V

### Output (Detector)

Parameters	Test Conditions	Symbol	Min.	Typ.	Max.	Unit
Collector-emitter breakdown voltage	$I_C = 1 \text{ mA}$	$V_{(BR)CEO}$	70			V
Emitter-collector breakdown voltage	$I_E = 100 \mu\text{A}$	$V_{(BR)ECO}$	7			V
Collector dark current	$V_{CE} = 20 \text{ V}$ , $I_F = 0$ , $E = 0$	$I_{CEO}$			100	nA

### Coupler

Parameters	Test Conditions	Symbol	Min.	Typ.	Max.	Unit
DC isolation test voltage	$t = 2 \text{ s}$	$V_{IO}^{1)}$	2.5			kV
Isolation resistance	$V_{IO} = 1000 \text{ V}$ , 40% relative humidity	$R_{IO}^{1)}$		$10^{12}$		$\Omega$
Collector-emitter saturation voltage	$I_F = 10 \text{ mA}$ , $I_C = 1 \text{ mA}$	$V_{CEsat}$			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	$f = 1 \text{ MHz}$	$C_k$		0.3		pF

1) Related to standard climate 23/50 DIN 50 014

### Current Transfer Ratio (CTR)

Parameters	Test Conditions	Type	Symbol	Min.	Typ.	Max.	Unit
$I_C/I_F$	$V_{CE} = 5 \text{ V}$ , $I_F = 5 \text{ mA}$	MCT6	CTR	0.5	1		
$I_C/I_F$	$V_{CE} = 5 \text{ V}$ , $I_F = 10 \text{ mA}$	MCT6	CTR	0.6	1.2		
$I_C/I_F$	$V_{CE} = 5 \text{ V}$ , $I_F = 5 \text{ mA}$	MCT62	CTR	1	2		

## Switching Characteristics (Typical Values)

$V_S = 5\text{ V}$

Type	$R_L = 100\ \Omega$ , see figure 1						
	$t_d[\mu\text{s}]$	$t_r[\mu\text{s}]$	$t_{on}[\mu\text{s}]$	$t_s[\mu\text{s}]$	$t_f[\mu\text{s}]$	$t_{off}[\mu\text{s}]$	$I_C[\text{mA}]$
MCT6/ MCT62	3.0	3.0	6.0	0.3	4.7	5.0	2.0

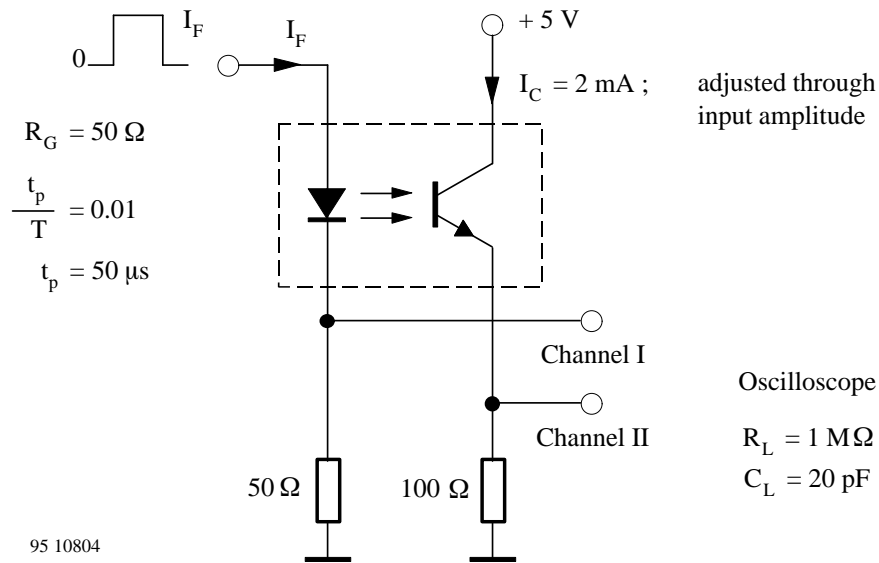


Figure 1. Test circuit

## Ozone Depleting Substances Policy Statement

It is the policy of **TEMIC TELEFUNKEN microelectronic GmbH** to

1. Meet all present and future national and international statutory requirements.
2. Regularly and continuously improve the performance of our products, processes, distribution and operating systems with respect to their impact on the health and safety of our employees and the public, as well as their impact on the environment.

It is particular concern to control or eliminate releases of those substances into the atmosphere which are known as ozone depleting substances (ODSs).

The Montreal Protocol (1987) and its London Amendments (1990) intend to severely restrict the use of ODSs and forbid their use within the next ten years. Various national and international initiatives are pressing for an earlier ban on these substances.

**TEMIC TELEFUNKEN microelectronic GmbH** semiconductor division has been able to use its policy of continuous improvements to eliminate the use of ODSs listed in the following documents.

1. Annex A, B and list of transitional substances of the Montreal Protocol and the London Amendments respectively
2. Class I and II ozone depleting substances in the Clean Air Act Amendments of 1990 by the Environmental Protection Agency (EPA) in the USA
3. Council Decision 88/540/EEC and 91/690/EEC Annex A, B and C (transitional substances) respectively.

**TEMIC** can certify that our semiconductors are not manufactured with ozone depleting substances and do not contain such substances.

**We reserve the right to make changes to improve technical design and may do so without further notice.**

Parameters can vary in different applications. All operating parameters must be validated for each customer application by the customer. Should the buyer use TEMIC products for any unintended or unauthorized application, the buyer shall indemnify TEMIC against all claims, costs, damages, and expenses, arising out of, directly or indirectly, any claim of personal damage, injury or death associated with such unintended or unauthorized use.

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