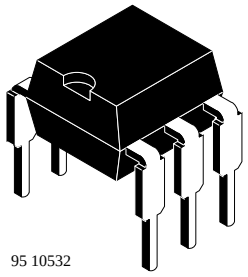
TCDF1900/ TCDF1910

Optocoupler with Photo-MOS FET

Description

The TCDF1900/ TCDF1910 consist of two MOS FET transistors connected with a photovoltaic element, optically coupled to a gallium arsenide infrared emitting diode in a 6 lead plastic dual inline packages.



Applications

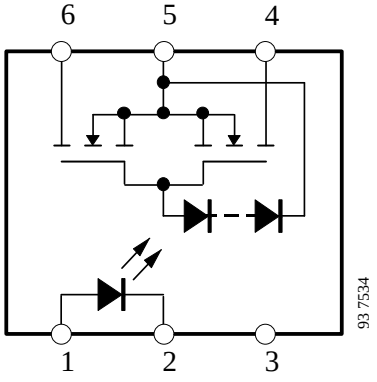
Switches for AC and/or DC voltages in

- Telecommunication, Fax modem, Line cards, Public phones, Fax machines
- Bounce-free switching
- General replacement of mechanical device

Features

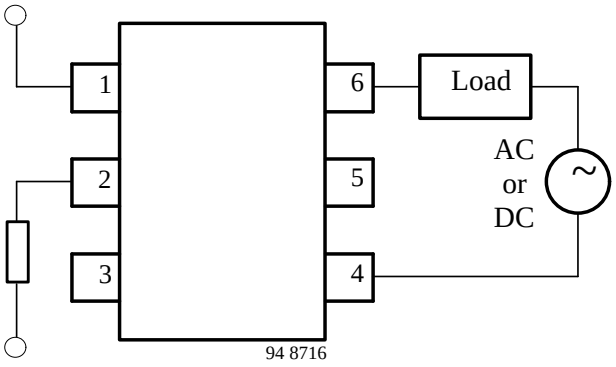
- Peak off state voltage
  TCDF1900: V_{OFF} = 400 V min
  TCDF1910: V_{OFF} = 250 V min
- Input threshold current I_{FT} = 5 mA max
- On state current
  TCDF1900: I_{ON} = 125 mA max
  TCDF1910: I_{ON} = 200 mA max
- On state resistance
  TCDF1900: R_{ON} = 24 Ω max
  TCDF1910: R_{ON} = 12 Ω max

Pin Connection

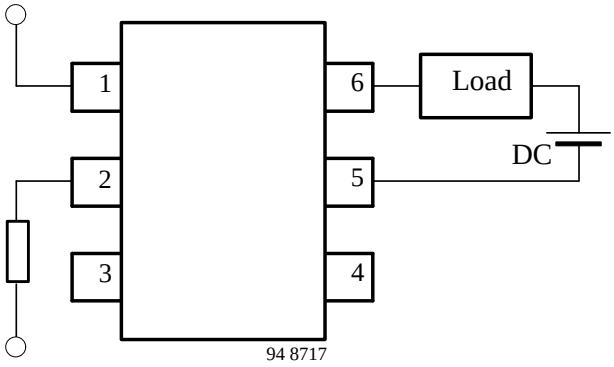


1	Anode
2	Cathode
3	NC
4	Drain D1
5	Source
6	Drain D2

Connection Table

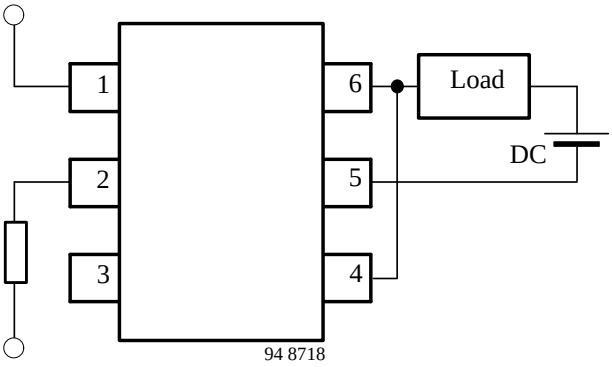


A connection



B connection

TCDF1900/ TCDF1910



C connection

Absolute Maximum Ratings

Input (Emitter)

Parameters	Test Conditions	Symbol	Value	Unit
Reverse voltage		V_R	5	V
Forward current		I_F	30	mA
Forward surge current	$t_p \le 10$ µs	I_{FSM}	3	A
Power dissipation	$T_{amb} \le 25°C$	P_{tot}	100	mW
Junction temperature		T_j	125	°C

Output (Detector)

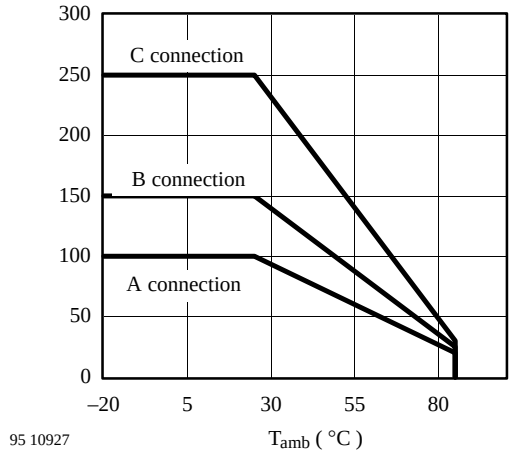
Parameters	Type	Test Conditions	Symbol	Value	Unit
Output off state Terminal voltage	TCDF1900 TCDF1910		V_{OFF}	400 250	V
On state current	TCDF1900 TCDF1900 TCDF1900	connection A B C	I_{ON}	125 125 250	mA
On state current	TCDF1910 TCDF1910 TCDF1910	connection A B C	I_{ON}	200 200 400	mA
On state resistance	TCDF1900 TCDF1900 TCDF1900	connection A B C	R_{ON}	24 12 6	Ω
On state resistance	TCDF1910 TCDF1910 TCDF1910	connection A B C	R_{ON}	12 6 3	Ω

Coupler

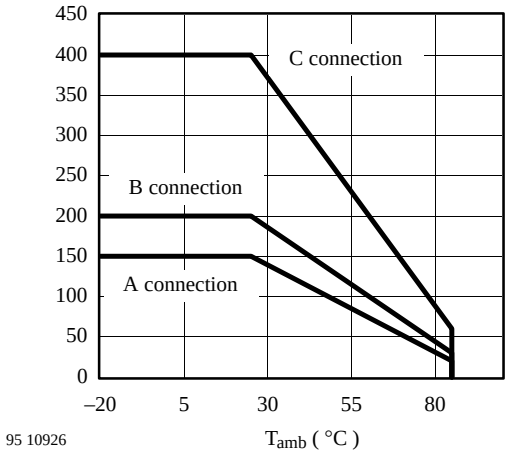
Parameters	Test Conditions	Symbol	Value	Unit
AC isolation test voltage (RMS)		V_{IO} [1)]	3.75	kV
Ambient temperature range		T_{amb}	–20 to +85	°C
Storage temperature range		T_{stg}	–55 to +100	°C
Soldering temperature	2 mm from case, t ≤ 10 s	T_{sd}	260	°C

1) Related to standard climate 23/50 DIN 50014

Derating Diagrams



TCDF1900



TCDF1910

Electrical Characteristics T_{amb} = 25°C

Input (Emitter)

Parameters	Test Conditions	Type	Symbol	Min.	Typ.	Max.	Unit
Forward voltage	I_F = 50 mA		V_F		1.4	1.7	V
Breakdown voltage	I_R = 10 µA		$V_{(BR)}$	5			V
Junction capacitance	V_R = 0, f = 1 MHz		C_j		60		pF

Output (Detector)

Parameters	Test Conditions	Type	Symbol	Min.	Typ.	Max.	Unit
Off State current	V_S = 320 V	TCDF1900	I_{off}			1	µA
Off State current	V_S = 200 V	TCDF1910	I_{off}			1	µA

Coupler

Parameters	Test Conditions	Type	Symbol	Min.	Typ.	Max.	Unit
Input threshold current	I_{ON} = 100 mA		I_{FT}		1	5	mA
On state resistance	I_{ON} = 125 mA, I_{FT} = 10 mA	TCDF1900	R_{ON}		15	24	Ω
On state resistance	I_{ON} = 200 mA, I_{FT} = 10 mA	TCDF1910	R_{ON}		7	17	Ω
Isolation resistance	V_{IO} = 500 V		R_{IO} [1)]		10^{12}		Ω
AC isolation test voltage (RMS)			V_{IO} [1,2)]	3.75			kV
Coupling capacitance	f = 1 MHz		C_k		0.6		pF

1) Related to standard climate 23/50 DIN 50014

2) For 100% test: t = 2 s, for sample test : t = 1 min

TCDF1900/ TCDF1910

Switching Characteristics T_{amb} = 25 °C

Type	R_L = 200 Ω, see figure 1 and 2									
	t_d[µs]	t_r[µs]	t_{on}[µs]	t_s[µs]	t_f[µs]	t_{off}[µs]	I_C[mA]	t_{on}[µs]	t_{off}[µs]	I_F[mA]
TCDF1900/ TCDF1910			0.1			0.2				10

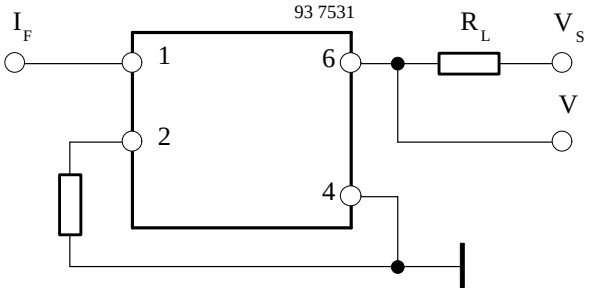


Figure 1. Test circuit

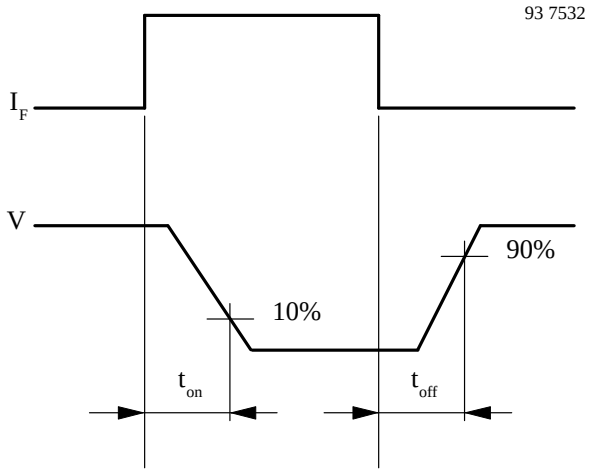
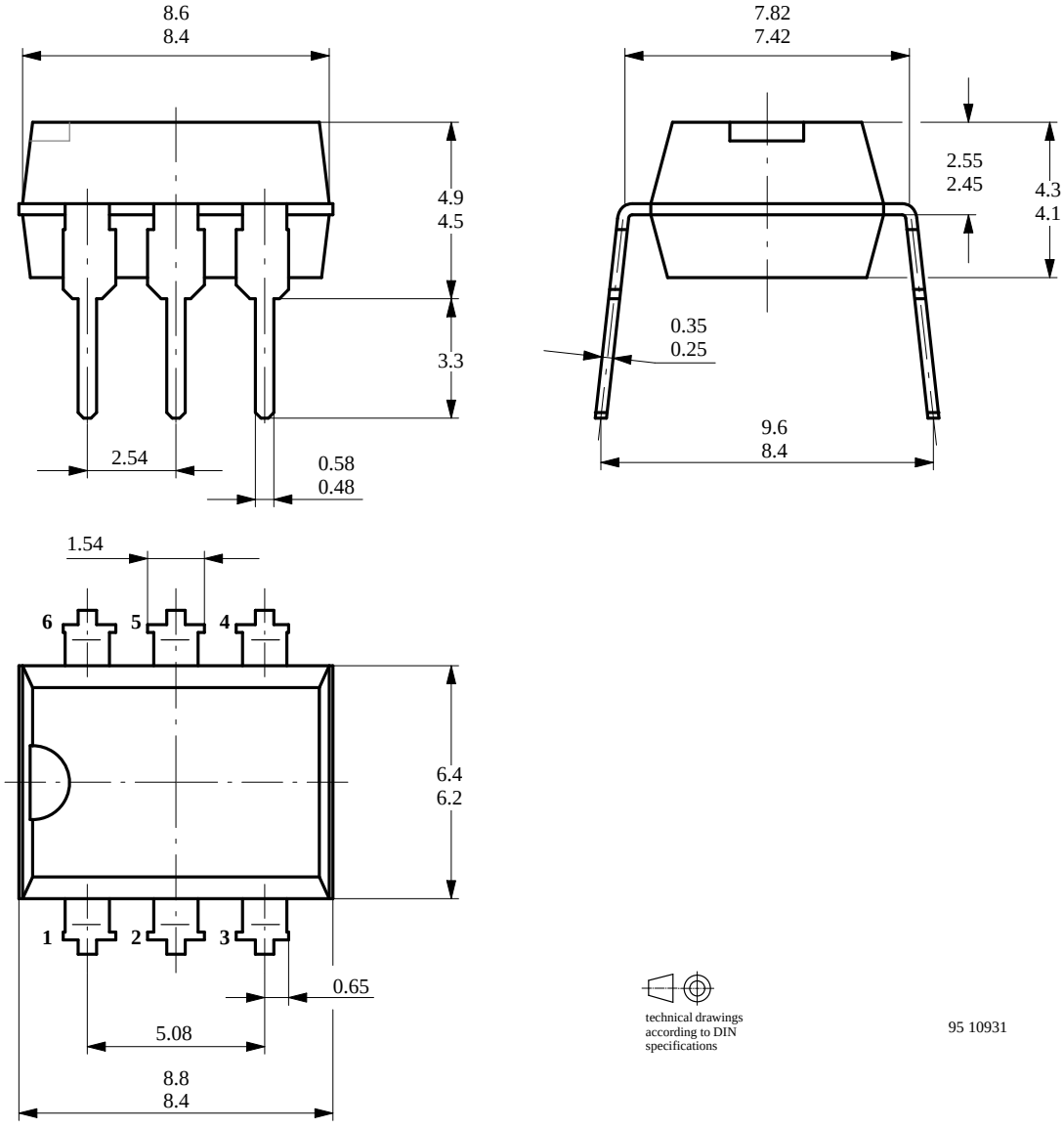


Figure 2. Impulse diagram

Dimensions in mm



technical drawings
according to DIN
specifications

95 10931

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.

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