



ABSOLUTE MAXIMUM RATINGS (T _{amb} = 25 °C, unless otherwise specified)				
PARAMETER	TEST CONDITION	SYMBOL	VALUE	UNIT
INPUT				
Reverse voltage		V _R	6	V
Forward current		I _F	60	mA
Surge current	t ≤ 10 μs	I _{FSM}	2.5	A
Power dissipation		P _{diss}	70	mW
OUTPUT				
Collector emitter breakdown voltage		V _{CEO}	70	V
Emitter base breakdown voltage		V _{EBO}	7	V
Collector current		I _C	50	mA
Collector peak current	t _p /T = 0.5, t _p ≤ 10 ms	I _{CM}	100	mA
Output power dissipation		P _{diss}	150	mW
COUPLER				
Isolation test voltage	t = 1 s	V _{ISO}	5000	V _{RMS}
Creepage distance			≥ 7	mm
Clearance distance			≥ 7	mm
Isolation thickness between emitter and detector			≥ 0.4	mm
Comparative tracking index	DIN IEC 112/VDE 0303, part 1		≥ 175	
Isolation resistance	V _{IO} = 500 V, T _{amb} = 25 °C	R _{IO}	≥ 10 ¹²	Ω
	V _{IO} = 500 V, T _{amb} = 100 °C	R _{IO}	≥ 10 ¹¹	Ω
Storage temperature		T _{stg}	- 55 to + 150	°C
Operating temperature		T _{amb}	- 55 to + 100	°C
Soldering temperature ⁽¹⁾	2 mm from case, ≤ 10 s	T _{sld}	260	°C

Notes

- 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.
- ⁽¹⁾ Refer to reflow profile for soldering conditions for surface mounted devices (SMD). Refer to wave profile for soldering conditions for through hole devices (DIP).

ELECTRICAL CHARACTERISTICS (T _{amb} = 25 °C, unless otherwise specified)							
PARAMETER	TEST CONDITION	PART	SYMBOL	MIN.	TYP.	MAX.	UNIT
INPUT							
Forward voltage ⁽¹⁾	I _F = 10 mA		V _F		1.2	1.5	V
	I _F = 10 mA, T _{amb} = - 55 °C		V _F	0.9	1.3	1.7	V
Reverse current ⁽¹⁾	V _R = 6 V		I _R		0.1	10	μA
Capacitance	V _R = 0 V, f = 1 MHz		C _O		25		pF
OUTPUT							
Collector emitter breakdown voltage ⁽¹⁾	I _C = 1 mA	4N35	BV _{CEO}	30			V
		4N36	BV _{CEO}	30			V
		4N37	BV _{CEO}	30			V
		4N38	BV _{CEO}	80			V
Emitter collector breakdown voltage ⁽¹⁾	I _E = 100 μA		BV _{ECO}	7			V
Collector base breakdown voltage ⁽¹⁾	I _C = 100 μA, I _B = 1 μA	4N35	BV _{CBO}	70			V
		4N36	BV _{CBO}	70			V
		4N37	BV _{CBO}	70			V
		4N38	BV _{CBO}	80			V

ELECTRICAL CHARACTERISTICS ($T_{amb} = 25\text{ }^{\circ}\text{C}$, unless otherwise specified)							
PARAMETER	TEST CONDITION	PART	SYMBOL	MIN.	TYP.	MAX.	UNIT
OUTPUT							
Collector emitter leakage current ⁽¹⁾	$V_{CE} = 10\text{ V}, I_F = 0$	4N35	I_{CEO}		5	50	nA
		4N36	I_{CEO}		5	50	nA
	$V_{CE} = 10\text{ V}, I_F = 0$	4N37	I_{CEO}		5	50	nA
		4N38	I_{CEO}			50	nA
	$V_{CE} = 30\text{ V}, I_F = 0,$ $T_{amb} = 100\text{ }^{\circ}\text{C}$	4N35	I_{CEO}			500	μA
		4N36	I_{CEO}			500	μA
4N37		I_{CEO}			500	μA	
$V_{CE} = 60\text{ V}, I_F = 0,$ $T_{amb} = 100\text{ }^{\circ}\text{C}$	4N38	I_{CEO}		6		μA	
Collector emitter capacitance	$V_{CE} = 0$		C_{CE}		6		pF
coupler							
Resistance, input output ⁽¹⁾	$V_{IO} = 500\text{ V}$		R_{IO}	10^{11}			Ω
Capacitance, input output	$f = 1\text{ MHz}$		C_{IO}		0.5		pF

Notes

- 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.
- ⁽¹⁾ Indicates JEDEC registered value.

CURRENT TRANSFER RATIO ($T_{amb} = 25\text{ }^{\circ}\text{C}$, unless otherwise specified)								
PARAMETER	TEST CONDITION	PART	SYMBOL	MIN.	TYP.	MAX.	UNIT	
I_C/I_F ⁽¹⁾	$V_{CE} = 10\text{ V}, I_F = 10\text{ mA}$	4N35	CTR_{DC}	100			%	
		4N36	CTR_{DC}	100			%	
		4N37	CTR_{DC}	100			%	
	$V_{CE} = 10\text{ V}, I_F = 20\text{ mA}$	4N38	CTR_{DC}	20			%	
		$V_{CE} = 10\text{ V}, I_F = 10\text{ mA},$ $T_A = -55\text{ }^{\circ}\text{C to } +100\text{ }^{\circ}\text{C}$	4N35	CTR_{DC}	40	50		%
			4N36	CTR_{DC}	40	50		%
4N37	CTR_{DC}		40	50		%		
4N38	CTR_{DC}		30			%		

Note

- ⁽¹⁾ Indicates JEDEC registered values.

SWITCHING CHARACTERISTICS ($T_{amb} = 25\text{ }^{\circ}\text{C}$, unless otherwise specified)							
PARAMETER	TEST CONDITION	SYMBOL	MIN.	TYP.	MAX.	UNIT	
Turn-on time ⁽¹⁾	$V_{CC} = 5\text{ V}, I_C = 2\text{ mA}, R_L = 100\text{ }\Omega$	t_{on}		10		μs	
Turn-off time ⁽¹⁾	$V_{CC} = 5\text{ V}, I_C = 2\text{ mA}, R_L = 100\text{ }\Omega$	t_{off}		10		μs	

Note

- ⁽¹⁾ Indicates JEDEC registered values.

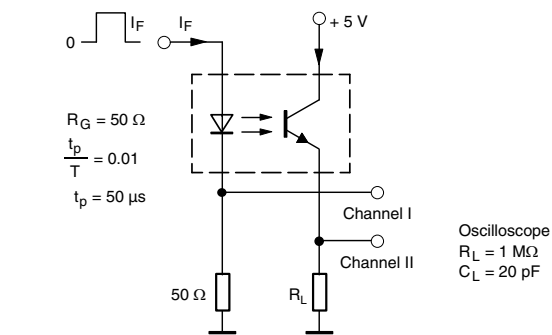


Fig. 1 - Test Circuit, Non-Saturated Operation



Fig. 2 - Switching Times

TYPICAL CHARACTERISTICS ($T_{amb} = 25\text{ }^{\circ}\text{C}$, unless otherwise specified)



Fig. 3 - Forward Voltage vs. Forward Current



Fig. 6 - Leakage Current vs. Ambient Temperature



Fig. 4 - Collector Current vs. Collector Emitter Voltage (NS)



Fig. 7 - Normalized CTR (NS) vs. Ambient Temperature



Fig. 5 - Collector Current vs. Collector Emitter Voltage (sat)



Fig. 8 - Normalized CTR (sat) vs. Ambient Temperature



Fig. 9 - Normalized CTR (NS) vs. Forward Current

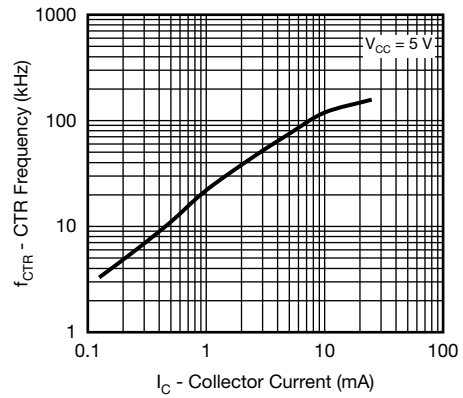


Fig. 12 - CTR Frequency vs. Collector Current

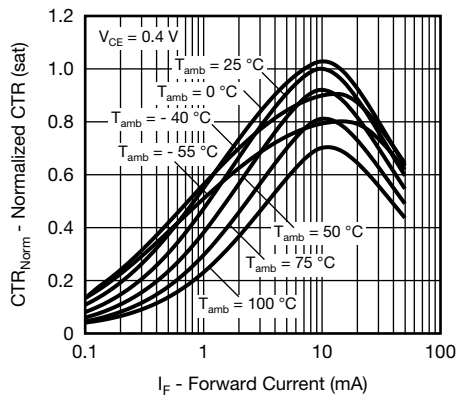


Fig. 10 - Normalized CTR (sat) vs. Forward Current

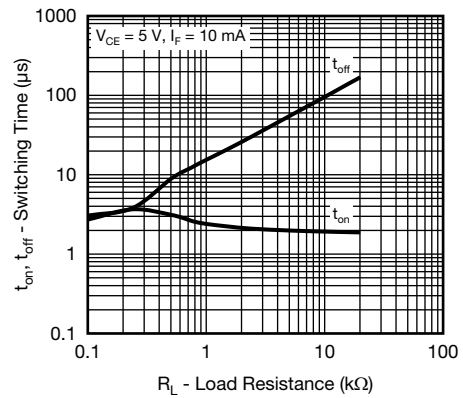


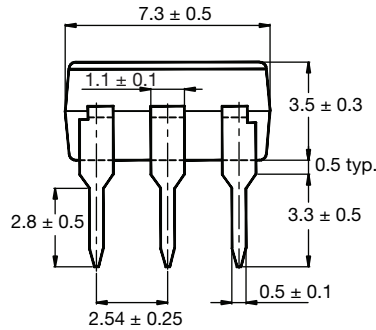
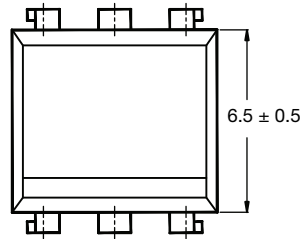
Fig. 13 - Switching Time vs. Load Resistance



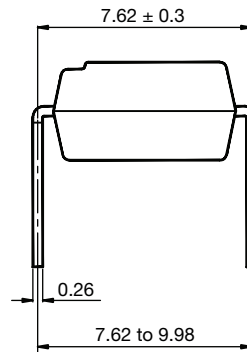
Fig. 11 - CTR Frequency vs. Phase Angle



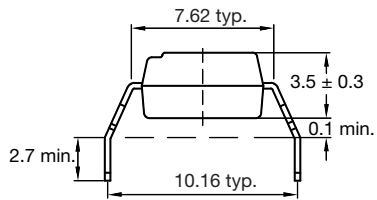
PACKAGE DIMENSIONS in millimeters



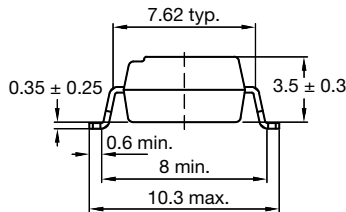
22530



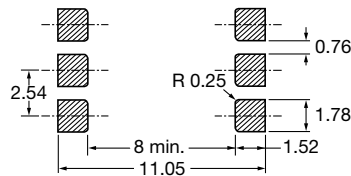
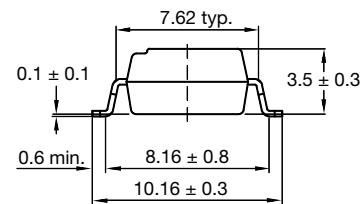
Option 6



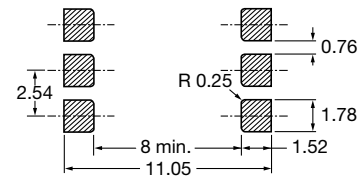
Option 7



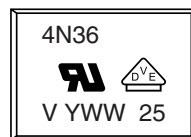
Option 9



20802-34



PACKAGE MARKING



Notes

- VDE logo is only marked on option 1 parts. Option information is not marked on the part.
- Tape and reel suffix (T) is not part of the package marking.



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