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BSI 9000 CECC 20000 APPROVED MANUFACTURER
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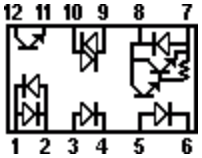
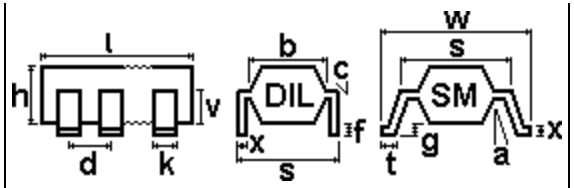
ISM200, 300, 400, 500: Hybrid Optocouplers

Circuit and Package

Example Circuit, ISM400 (different custom options are available):



		ISM200	ISM300	ISM400	ISM500
Measurement Units: mm					



	8 pin	12 pin	16 pin	20 pin
d	2.54			
l	8.89	13.97	19.05	24.13
s	7.52			

Description

The ISM200, ISM300, ISM400, ISM500 series are optically coupled isolators, consisting of a multichannel of different optocoupler circuits. Each channel can be designed to meet different configurations of the pin-outs to meet customer needs. The circuits consist of Gallium Arsenide infrared emitting diodes and a selection of NPN silicon phototransistor, phototriac, photodarlington, photodiode and integrated circuits mounted in a dual-in-line package. The company can offer a surface mount version package. (For surface mount requirement, add suffix S.)

Applications

Telecommunications, Modem, Data Systems, Switch Mode Power Supplies, Telephone Systems.

Absolute Maximum Ratings (Ta=25°C)

Storage Temperature:	-40°C to +125°C
Operating Temperature:	-30°C to +100°C
Lead Soldering:	260°C for 10s, 1.6mm from case
Input-to-Output Insulation Test Voltage:	±2500Vrms (Transient Overvoltage, t=10s)

Input Diode

Forward DC Current:	50mA
Reverse DC Voltage:	3V
Peak Forward Current:	1A (pw.=100µs, duty ratio 0.001)
Power Dissipation:	70mW
Derate Linearly:	1.33mW/°C above 25°C

Output

Collector-Emitter Voltage BVceo:	35V
Emitter-Base Voltage BVebo:	6V
Collector Current:	50mA
Power Dissipation:	150mW
Derate Linearly:	2.00mW/°C above 25°C

Electrical Characteristics

Phototransistor Option

INPUT	PARAMETER	CONDITIONS	MIN	TYP	MAX	UNIT
V_F	Forward Voltage	I_F=50mA			1.5	V
I_R	Reverse Current	V_R=3V			10	µA
C_T	Capacitance	f=1MHz, V_R=0				pF
OUTPUT	**PARAMETER**	**CONDITIONS**	**MIN**	**TYP**	**MAX**	**UNIT**
BV_{CEO}	Collector-Emitter Voltage	I_C=1mA	30	50		V
BV_{ECO}	Emitter-Collector Voltage	I_E=0.1mA	7	8		V
I_{CEO}	Collector-Emitter Dark Current	V_{CE}=10V			50	nA
C_{CE}	Collector-Emitter Capacitance	V_{CE}=10V, f=1MHz				pF
COUPLED	**PARAMETER**	**CONDITIONS**	**MIN**	**TYP**	**MAX**	**UNIT**
I_C / I_F	DC Current Transfer Ratio	I_F=10mA, V_{CE}=10V	20	50		%
V_{CE}(SAT)	Collector-Emitter Saturation Voltage	I_F=16mA, I_C=1.6mA		0.2	0.5	V
C_F	Floating Capacitance	V=0, f=1MHz		0.6	1	pF
R_{ISO}	Input-to-Output Isolation Resistance	V_{IO}=500V	50			Gohm

High Collector/Emitter Voltage Transistor Option

INPUT	PARAMETER	CONDITIONS	MIN	TYP	MAX	UNIT
V_F	Forward Voltage	I_F=±20mA		1.2	1.4	V
I_R	Reverse Current	V_R=3V			10	µA
C_T	Terminal Capacitance	f=1MHz, V=0		30	250	pF
OUTPUT	**PARAMETER**	**CONDITIONS**	**MIN**	**TYP**	**MAX**	**UNIT**
BV_{CEO}	Collector-Emitter Voltage	I_C=1mA	30	50		V
BV_{ECO}	Emitter-Collector Voltage	I_E=0.1mA	7	8		V
I_{CEO}	Collector-Emitter Dark Current	V_{CE}=20V, I_F=0			100	nA
COUPLED	**PARAMETER**	**CONDITIONS**	**MIN**	**TYP**	**MAX**	**UNIT**
I_C/I_F	DC Current Transfer Ratio	I_F=±5mA, V_{CE}=5V	20	50	300	%
$V_{CE(SAT)}$	Collector-Emitter Saturation Voltage	I_F=±20mA, I_C=1mA		0.1	0.2	V
C_F	Floating Capacitance	V=0, f=1MHz		0.6	1.0	pF
R_{ISO}	Input-to-Output Isolation Resistance	V_{IO}=500V	50	100		Gohm
T_{ON}	Turn-On Time	V_{CE}=2V, I_C=2mA, R_L=100ohm		4	18	µs
T_{OFF}	Turn-Off Time			3	18	µs

AC Input Option

INPUT	PARAMETER	CONDITIONS	MIN	TYP	MAX	UNIT
V_F	Forward Voltage	I_F=±20mA		1.2	1.4	V
I_R	Reverse Current	V_R=4V			10	µA
C_T	Terminal Capacitance	f=1kHz, V=0		30	250	pF
OUTPUT	**PARAMETER**	**CONDITIONS**	**MIN**	**TYP**	**MAX**	**UNIT**

BV_{CEO}	Collector-Emitter Voltage	I_C=1mA	30	50		V
BV_{ECO}	Emitter-Collector Voltage	I_E=0.1mA	7	8		V
I_{CEO}	Collector-Emitter Dark Current	V_{CE}=20V, I_F=0			100	nA
COUPLED	**PARAMETER**	**CONDITIONS**	**MIN**	**TYP**	**MAX**	**UNIT**
I_C/I_F	DC Current Transfer Ratio	I_F=±1mA, V_{CE}=5V	20			%
$V_{CE(SAT)}$	Collector-Emitter Saturation Voltage	I_F=±20mA, I_C=1mA		0.1	0.2	V
C_F	Floating Capacitance	V=0, f=1MHz		0.6	1.0	pF
R_{ISO}	Input-to-Output Isolation Resistance	V_{IO}=500V, RH=40~60%	50	100		Gohm
T_{ON}	Turn-On Time	V_{CE}=2V, I_C=2mA, R_L=100ohm		4	18	µs
T_{OFF}	Turn-Off Time			3	18	µs

High Sensitivity Photodarlington Option

INPUT	**PARAMETER**	**CONDITIONS**	**MIN**	**TYP**	**MAX**	**UNIT**
V_F	Forward Voltage	I_F=10mA		1.2	1.4	V
V_{FM}	Peak Forward Voltage	I_{FM}=0.5A			3	V
I_R	Reverse Current	V_R=4V			10	µA
C_T	Terminal Capacitance	f=1kHz, V=0		30	250	pF
OUTPUT	**PARAMETER**	**CONDITIONS**	**MIN**	**TYP**	**MAX**	**UNIT**
I_{CEO}	Collector-Emitter Dark Current	V_{CE}=200V, I_F=0, R_{BE}=infinite			1	µA
COUPLED	**PARAMETER**	**CONDITIONS**	**MIN**	**TYP**	**MAX**	**UNIT**
I_C/I_F	DC Current Transfer Ratio	I_F=1mA, V_{CE}=2V, R_{BE}=infinite	1000			%
R_{IO}	Input-to-Output Isolation Resistance	V_{IO}=500V, (note 1)				Gohm

$V_{CE(SAT)}$	Collector-Emitter Saturation Voltage	I_F=20mA, I_C=100mA, R_{BE}=infinite			0.5	V
C_F	Floating Capacitance	V=0, f=1MHz		0.6	1.0	pF
R_{ISO}	Input-Output Isolation Resistance	V_{IO}=500V, RH=40~60%	50	100		Gohm
T_{ON}	Turn-On Time	V_{CE}=2V, I_C=20mA, R_L=100ohm, R_{BE}=infinite		100	300	µs
T_{OFF}	Turn-Off Time			20	100	µs

Triac Output Circuit Option

INPUT	**PARAMETER**	**CONDITIONS**	**MIN**	**TYP**	**MAX**	**UNIT**
V_F	Forward Voltage	I_F=20mA		1.2	1.4	V
I_R	Reverse Current	V_R=3V			10	µA
OUTPUT	**PARAMETER**	**CONDITIONS**	**MIN**	**TYP**	**MAX**	**UNIT**
I_{DRM}	Repetitive Peak Off-State Current	V_{DRM}=Rated			1	µA
V_T	On-State Voltage	I_T=100mA		1.7	2.5	V
I_H	Holding Current	V_D=6V	0.1	1	3.5	mA
dV/dt	Critical Rate of Rise of Off-State Voltage	V_{DRM}=sqrt(½) Rated	600			V/µs
COUPLED	**PARAMETER**	**CONDITIONS**	**MIN**	**TYP**	**MAX**	**UNIT**
C_F	Floating Capacitance	V=0, f=1MHz		0.6	1	pF
R_{ISO}	Input-Output Isolation Resistance	V_{IO}=500V, RH=40~60%	50	100		Gohm
I_{FT}	Minimum Trigger Current	V_D=6V, R_L=100ohm			10	mA

Notes 1. Measured with input leads shorted together and output leads shorted together.

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