66143	QUAD CHANNEL HERMETIC 20 PIN LCC, OPTICALLY COUPLED ISOLATOR	MICROPAC

11-11-15

Features:

- High Reliability
- Base lead provided for conventional transistor biasing
- Very high gain, high voltage transistor
- Stability over wide temperature range.
- +1kVdc electrical isolation
- Screening available

Applications:

- Eliminate ground loops
- Level shifting
- Line receiver
- Switching power supplies
- Motor control

DESCRIPTION

The Mii ***66143*** -X02, -X03 and -X04 are optically coupled isolators, consisting of four GaAlAs LEDs and four silicon phototransistors mounted and coupled in a miniature surface mount hermetic leadless chip carrier. All electrical characteristics of each channel are identical to the JEDEC registered 4N47 (-X02), 4N48 (-X03) and 4N49 (-X04). Each unit contains four channels. These solid state couplers are ideal for designs where board space and device weight are important design considerations.

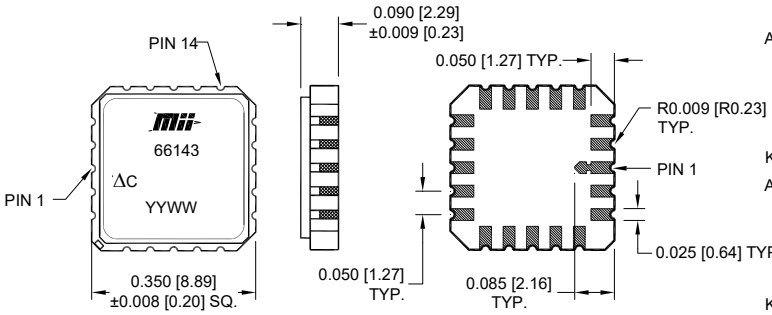
ABSOLUTE MAXIMUM RATINGS

Input-to-output Voltage (see Note 1)	±1kV
Collector-Base Voltage	45V
Collector-Emitter Voltage (Value applies to emitter-base open-circuited & the input-diode equal to zero)	40V
Emitter-Base Voltage	7V
Input Diode Reverse Voltage	3V
Input Diode Continuous Forward Current at (or below) 65°C Free-Air Temperature (see note 2)	40mA
Input Diode Power Dissipation	60mW
Continuous Collector Current	50mA
Continuous Transistor Power Dissipation at (or below) 25°C Free-Air Temperature (see Note 3)	300mW
Storage Temperature	-65°C to +150°C
Operating Free-Air Temperature Range	-55°C to +125°C
Lead Solder Temperature (10 seconds)	240°C

Notes:

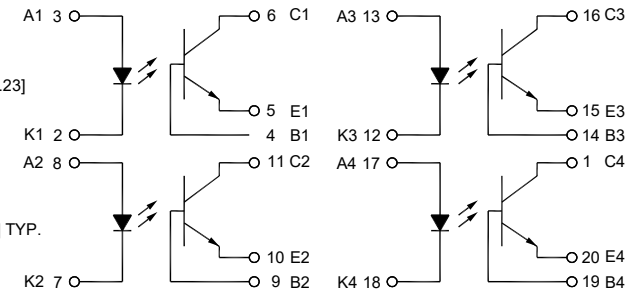
1. Measured with Inputs shorted together and outputs shorted together.
2. Derate linearly to 125°C free-air temperature at the rate of 0.67 mA/°C above 65°C.
3. Derate linearly to 125°C free-air temperature at the rate of 3 mW/°C.

Package Dimensions



ALL DIMENSIONS ARE IN INCHES [MILLIMETERS]

Schematic Diagram



ELECTRICAL CHARACTERISTICS

T_A = 25°C unless otherwise specified.

PARAMETER		SYMBOL	MIN	TYP	MAX	UNITS	TEST CONDITIONS	NOTE
Input Diode Static Reverse Current		I_R			100	µA	V_R = 3V	1
Input Diode Forward Voltage	-55°C	V_F	1.0		1.7	V	I_F = 10mA	
	+25°C		0.8		1.5			
	+100°C		0.7		1.3			

OUTPUT TRANSISTOR

T_A = 25°C unless otherwise specified.

Collector-Base Breakdown Voltage	$V_{(BR)CBO}$	45			V	I_C = 100µA, I_B = 0, I_F = 0	
Collector-Emitter Breakdown Voltage	$V_{(BR)CEO}$	40			V	I_C = 1mA, I_B = 0, I_F = 0	
Emitter-Base Breakdown Voltage	$V_{(BR)EBO}$	7			V	I_C = 0mA, I_E = 100µA, I_F = 0	

COUPLED CHARACTERISTICS

T_A = 25°C unless otherwise specified.

On State Collector Current	-X02	$I_{C(ON)}$	0.5		-	mA	V_{CE} = 5V, I_B = 0, I_F = 1mA	
T_a = +25°C	-X03		1.0		5			
	-X04		2.0		10			
On State Collector Current	-X02	$I_{C(ON)}$	0.7			mA	V_{CE} = 5V, I_B = 0, I_F = 2mA	
T_a = -55°C	-X03		1.4					
	-X04		2.8					
On State Collector Current	-X02	$I_{C(ON)}$	0.5			mA	V_{CE} = 5V, I_B = 0, I_F = 2mA	
T_a = +100°C	-X03		1.0					
	-X04		2.0					
On-State Collector Base Current		$I_{CB(ON)}$	30			µA	V_{CB} = 5V, I_E = 0, I_F = 10mA	
Off State Collector Current		$I_{C(OFF)}$			100	nA	V_{CE} = 20V, I_B = 0, I_F = 0mA	1
Off State Collector Current, T_a = +100°C		$I_{C(OFF)}$			100	µA	V_{CE} = 20V, I_B = 0, I_F = 0mA	1
Collector-Base Dark Current		$I_{CB(OFF)}$			10	nA	V_{CB} = 20V, I_E = 0, I_F = 0	
Collector-Emitter Saturation Voltage	-X02	$V_{CE(SAT)}$			0.3	V	I_F = 2mA, I_C = 0.5mA, I_B = 0	
	-X03				0.3		I_F = 2mA, I_C = 1mA, I_B = 0	
	-X04				0.3		I_F = 2mA, I_C = 2mA, I_B = 0	
Input to Output Resistance		R_{IO}	10^{11}			Ω	V_{IN-OUT} = 1kV, t_w = 100µs, duty cycle ≤ 1%	2
Input to Output Capacitance		C_{IO}			5	pF	F = 1MHz, V_{IN-OUT} = 0	
Rise Time (Phototransistor Operation)	-X02	t_r		10	20	µs	V_{CC} = 10V, I_F = 5mA, R_L = 100Ω, I_B = 0	
or	-X03	or		10	20			
Fall Time	-X04	t_f		15	25			
Rise Time (Photodiode Operation)	-X02	t_r		0.85	3	µs	V_{CC} = 10V, I_F = 5mA, R_L = 100Ω, I_E = 0	1
or	-X03	or		0.85	3			
Fall Time	-X04	t_f		0.85	3			

NOTES:
1. Parameter applies to all four channels.
2. These parameters are measured between all phototransistor leads shorted together and with both input diode leads shorted together.

RECOMMENDED OPERATING CONDITIONS:

PARAMETER.	SYMBOL	MIN	MAX	UNITS
Input Current, Low Level	I_{FL}	0	100	µA
Input Current, High Level	I_{FH}	1	10	mA
Supply Voltage	V_{CC}	5.0	20	V

SELECTION GUIDE

PART NUMBER	PART DESCRIPTION
66143-002	4N47 Commercial
66143-003	4N48 Commercial
66143-004	4N49 Commercial
66143-102	4N47 Screened
66143-103	4N48 Screened
66143-104	4N49 Screened