

Alphanumeric Index

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Additional solid state relays are included in our CII high performance relay product line. For an overview of the CII product line, see section 14 of this databook.

Solid State Relays &
Input/Output Modules 1101-1126

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SSRT series

“Hockey Puck” Solid State Relay With Snubberless Triac Output

us File E29244

Users should thoroughly review the technical data before selecting a product part number. It is recommended that users also seek out the pertinent approvals files of the agencies/laboratories and review them to ensure the product meets the requirements for a given application.

Features

- Standard “hockey puck” package.
- Enhanced noise immunity (designed to meet level 3 requirements of European EMC Directive).
- LED indicator.
- Floating terminal design.
- Low cost snubberless triac outputs.
- 10A & 25A rms versions.
- AC & DC input versions.
- 4000V rms isolation.

Engineering Data

Form: 1 Form A (SPST-NO).

Duty: Continuous.

Isolation: 4000V rms minimum, input - output.

Capacitance: 8.0 pf typical (input to output).

Temperature Range:

Storage: -40°C to +100°C

Operating Temperature: -20°C to + 80°C

Case Material: Plastic, UL rated 94V-0.

Case and Mounting: Refer to outline dimension.

Termination: Refer to outline dimension.

Approximate Weight: 3.5 oz. (98g).

Ordering Information

Sample Part Number ►

SSRT -240 D 10

1. Basic Series: SSRT = “hockey puck” triac output solid state relay

2. Line Voltage: 240 = 24 - 280 VAC

3. Input Type & Voltage: A = 90 - 280 VAC linear
D = 3 - 32 VDC constant current

4. Maximum Switching Rating: 10 = .1 - 10A rms, mounted to heatsink
25 = .1 - 25A rms, mounted to heatsink

Our authorized distributors are more likely to maintain the following items in stock for immediate delivery.

SSRT-240A10 SSRT-240D10
SSRT-240A25 SSRT-240D25

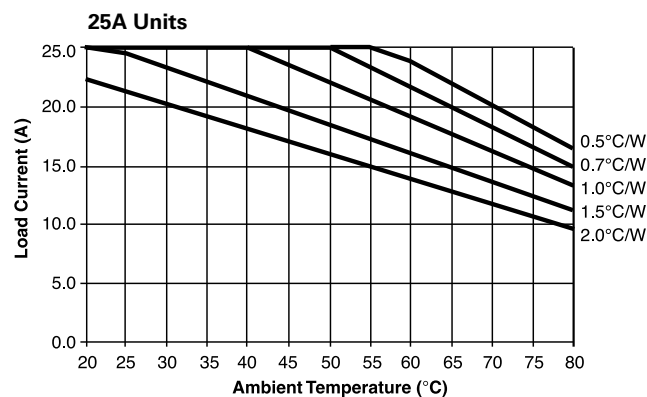
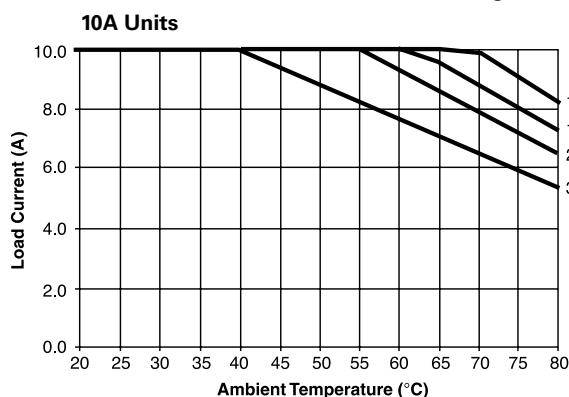
Input Specifications

Parameter	AC Input/AC Output	DC Input/AC Output
Control Voltage Range V_{IN}	90 - 280VAC	3 - 32VDC
Must Operate Voltage $V_{IN(OP)}$ (Max.)	90VAC	3VDC
Must Release Voltage $V_{IN(REL)}$ (Min.)	10VAC	1VDC
Input Current (Max.)	8.5mA	14mA

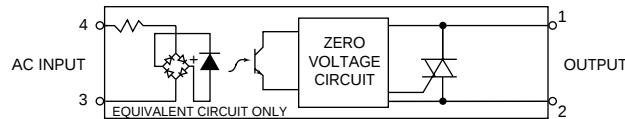
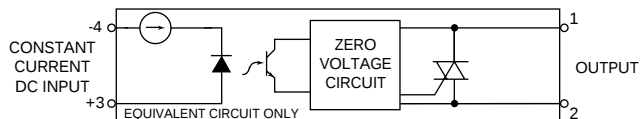
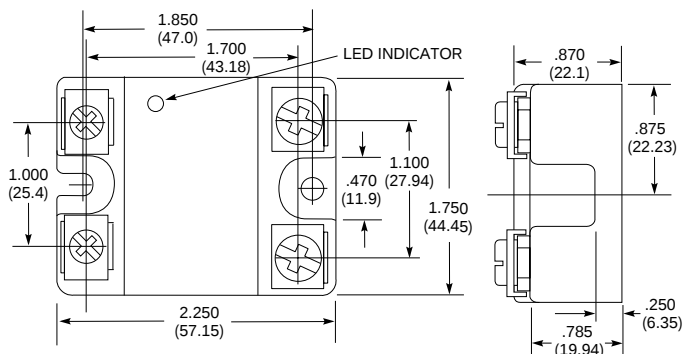
Output Specification (@ 25°C, unless otherwise specified)

Parameter	Conditions	Units	SSRT-240A10 & SSRT-240D10	SSRT-240A25 & SSRT-240D25
Load Voltage Range V_L		V rms	24 - 280	
Repetitive Blocking Voltage (Min.)		V peak	±600	
Load Current Range I_L^*	Resistive	A rms	.1 - 10	.1 - 25
Single Cycle Surge Current (Min.)		A peak	100	250
Leakage Current (Off-State) (Max.)	$f = 60 \text{ Hz}$, $V_L = \text{Nom.}$ (120 or 240 V rms)	mA rms	.1	
On-State Voltage Drop (Max.)	$I_L = \text{Max.}$	V peak	1.5	1.3
Static dv/dt (Off-State) (Min.)		V/μs	500	
Thermal Resistance, Junction to Case ($R_{\theta JC}$) (Max.)		°C/W	2.2	1.7
Turn-On Time (Max.)	$f = 60 \text{ Hz}$	ms	8.3 for DC input types, 20 for AC input types	
Turn-Off Time (Max.)	$f = 60 \text{ Hz}$	ms	8.3 for DC input types, 30 for AC input types	
$I^2 t$ Rating	$t = 8.3 \text{ ms}$	A ² Sec.	41	240
Load Power Factor Rating	$I_L = \text{Max.}$		0.5 - 1.0	

*See Derating Curves

Electrical Characteristics (Thermal Derating Curves)**Heatsink Recommendations**

- We recommend that solid state relay modules be mounted to a heatsink sufficient to maintain the module's base temperature at less than 85°C under worst case ambient temperature and load conditions.
- The heatsink mounting surface should be a smooth (30-40 micro-inch finish), flat (30-40 micro-inch flatness across mating area), un-painted surface which is clean and free of oxidation.
- An even coating of thermal compound (Dow Corning DC340 or equivalent) should be applied to both the heatsink and module mounting surfaces and spread to a uniform depth of .002" to eliminate all air pockets.
- The module should be mounted to the heatsink using two #10 screws.

Operating Diagrams**Outline Dimensions**



"Hockey Puck" Solid State Relay With Paired SCR Output

cUL[®] US File E81606

Users should thoroughly review the technical data before selecting a product part number. It is recommended that users also seek out the pertinent approvals files of the agencies/laboratories and review them to ensure the product meets the requirements for a given application.

- Standard “hockey puck” package.
- Enhanced noise immunity (designed to meet level 3 requirements of European EMC Directive).
- LED indicator.
- Inverse parallel SCR output.
- 25, 50, & 125A rms versions.
- 120/240VAC & 480VAC output types.
- Zero voltage and random voltage turn-on versions.
- AC & DC input versions.
- 4,000V rms optical isolation.
- Floating terminal design.

Engineering Data

Form: 1 Form A (SPST-NO).

Duty: Continuous.

Isolation: 4,000V rms minimum.

Capacitance: 8 pf typical (input to output).

Temperature Range:

Storage: -40°C to +100°C

Operating: -20°C to +80°C

Case Material: Plastic. UL rated 94V-0.

Case and Mounting: Refer to outline dimension.

Termination: Refer to outline dimension.

Approximate Weight: 3.5 oz. (98g).

Ordering Information

Sample Part Number ▶ **SSR** **-240** **D** **25**

- 1. Basic Series:** SSR = "hockey puck" inverse parallel SCR output solid state relay

- 2. Line Voltage:** 240 = 24 - 240VAC 480 = 48 - 660VAC

- 3. Input Type & Voltage:** A = 90 - 280VAC
D = 3 - 32VDC

- 4. Maximum Switching Rating/Output:** 25 = .1 - 25A rms, mounted to heatsink
50 = .1 - 50A rms, mounted to heatsink
125 = .1 - 125A rms, mounted to heatsink

- 5. Options:** Leave Blank = Zero voltage turn-on
R = Random voltage turn-on (phase controllable)

Our authorized distributors are more likely to maintain the following items in stock for immediate delivery.

SSR-480D125

Input Specifications

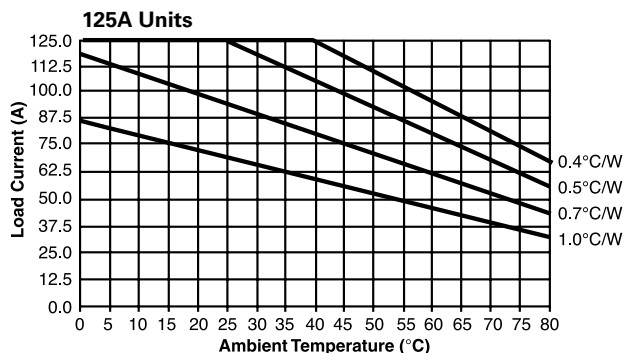
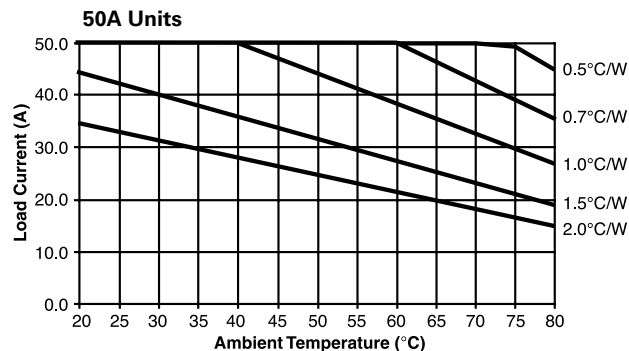
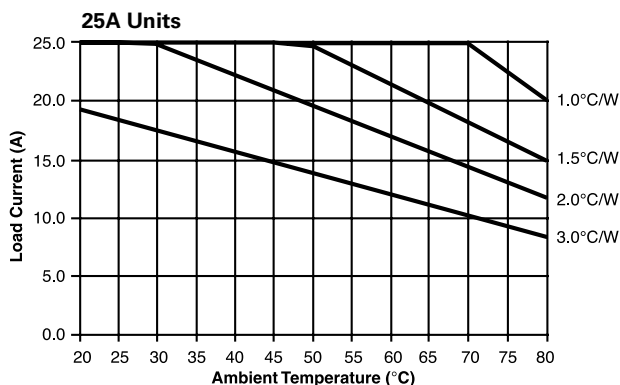
Parameter	AC Input	DC Input
	Zero V Turn-on Units	Zero and Random V Turn-on Units
Control Voltage Range V_{IN}	90 - 280VAC	3 - 32VDC
Must Operate Voltage $V_{IN(OP)}$ (Min.)	90VAC	3VDC
Must Release Voltage $V_{IN(REL)}$ (Min.)	10VAC	1VDC
Input Current (Max.)	15mA	15mA

Output Specifications (@ 25° C, unless otherwise specified)

Parameter	Nom. Line Voltage	Conditions	Units	25A Models	50A Models	125A Models
Load Voltage Range V_L	120/240V Model		V rms	24 - 280		
	480V Model		V rms	48 - 660		
Repetitive Blocking Voltage (Min.)	120/240 Model		V peak	±600		
	480V Model		V peak	±1200		
Load Current Range I_L^*	120/240 & 480V Models	Resistive	A rms	.05 - 25	.1 - 50	.1 - 125
Single Cycle Surge Current (Min.)	120/240 & 480V Models		A peak	250	750	1,700
Leakage Current (Off-State) (Max.)	120/240V Model	f = 60 Hz. $V_L = 240V$ rms	mA rms	.1		
	480V Model	f = 60 Hz. $V_L = 480V$ rms		.25		
On-State Voltage Drop (Max.)	120/240 & 480V Models	$I_L = \text{Max.}$		1.35		
Static dv/dt (Off-State) (Min.)	120/240 & 480V Models		V/μs	500		
Thermal Resistance, Junction to Case ($R_{\theta JC}$) (Max.)	120/240 & 480V Models		°C/W	0.4	0.25	.15
Turn-On Time (Max.)	120/240 & 480V Models	f = 60 Hz.	ms	8.3 for Zero Voltage Turn-On DC input types, 20 for Zero Voltage Turn-On AC input types, 0.02 for Random Voltage Turn-On Models		
Turn-Off Time (Max.)	120/240 & 480V Models	f = 60 Hz.	ms	8.3 for DC input types, 30 for AC input types		
I^2T Rating	120/240 & 480V Models	t = 8.3 ms	A ² Sec.	937	2,458	12,000
Load Power Factor Rating	120/240 & 480V Models	$I_L = \text{Max.}$		0.5 - 1.0		

*See Derating Curves

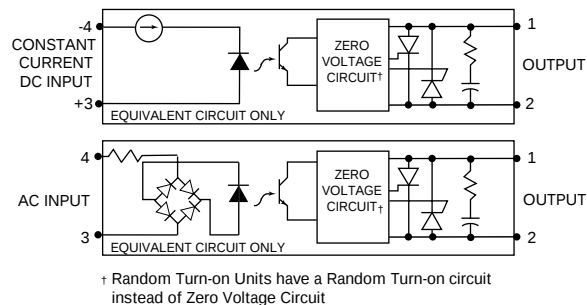
Electrical Characteristics (Thermal Derating Curves)



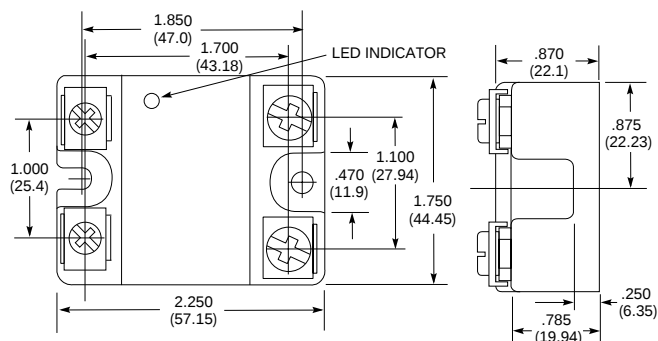
Heatsink Recommendations

- We recommend that solid state relay modules be mounted to a heatsink sufficient to maintain the module's base temperature at less than 85°C under worst case ambient temperature and load conditions.
- The heatsink mounting surface should be a smooth (30-40 micro-inch finish), flat (30-40 micro-inch flatness across mating area), un-painted surface which is clean and free of oxidation.
- An even coating of thermal compound (Dow Corning DC340 or equivalent) should be applied to both the heatsink and module mounting surfaces and spread to a uniform depth of .002" to eliminate all air pockets.
- The module should be mounted to the heatsink using two #10 screws.

Operating Diagrams



Outline Dimensions





SSRD series

Dual AC Output "Hockey Puck" Solid State Relay With Paired SCR Outputs

File E81606

Users should thoroughly review the technical data before selecting a product part number. It is recommended that users also seek out the pertinent approvals files of the agencies/laboratories and review them to ensure the product meets the requirements for a given application.

Features

- Two independent AC output solid state relays in one standard package.
- Enhanced noise immunity (designed to meet level 3 requirements of European EMC Directive).
- Inverse parallel SCR outputs.
- 25A rms & 40A rms versions available.
- 4-15 VDC input control.
- Zero voltage and random voltage turn-on versions.
- 4000V rms optical isolation.
- Quick connect style terminals.

Engineering Data

Form: 2 Form A (2 SPST-NO).

Duty: Continuous.

Isolation: 4000V rms input-to-output;
2500V rms input or output to ground.

Capacitance: 8.0 pf typical (input to output).

Temperature Range:

Storage: -40°C to +100°C

Operating: -40°C to + 80°C

Case Material: Plastic, UL rated 94V-0.

Case and Mounting: Refer to outline dimension.

Termination: Refer to outline dimension.

Approximate Weight: 3.5 oz. (98g).

Ordering Information

Sample Part Number ►

SSRD -240 D 25

1. Basic Series: SSRD = Dual output SSR - 2 SPST - NO

2. Line Voltage: 240 = 24-280 VAC

3. Input Type & Voltage: D = 4-15 VDC

4. Maximum Switching Rating/Output: 25 = .1-25A rms @ 25°C, mounted to heatsink
40 = .1-40A rms @ 25°C, mounted to heatsink

5. Options: Blank = Zero voltage turn-on (both outputs)
R = Random voltage turn-on (both outputs)

Our authorized distributors are more likely to maintain the following items in stock for immediate delivery.

SSRD-240D25

SSRD-240D40

Input Specifications

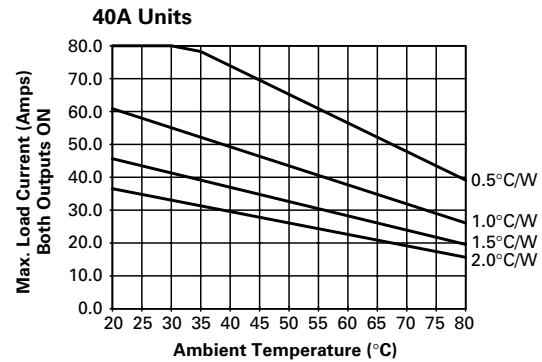
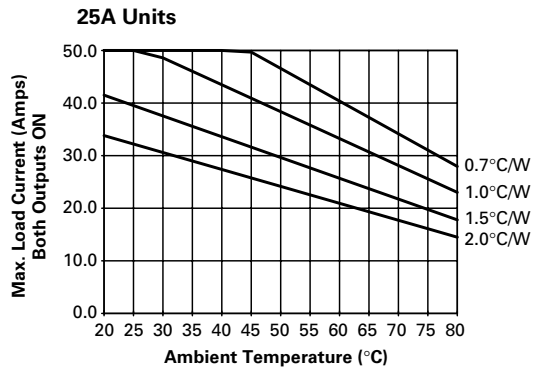
Parameter	Units	Zero V Turn-on and Random V Turn-on Units
Control Voltage Range V_{IN}	VDC	4-15
Must Operate Voltage $V_{IN(OP)}$ (Min.)	VDC	3.75
Must Release Voltage $V_{IN(REL)}$ (Min.)	VDC	1
Input Current (Max.)	mA DC	34
Input Current (Min. for On-State)	mA DC	7.5
Input Resistance	Ohms	500

Output Specifications (@ 25° C, unless otherwise specified)

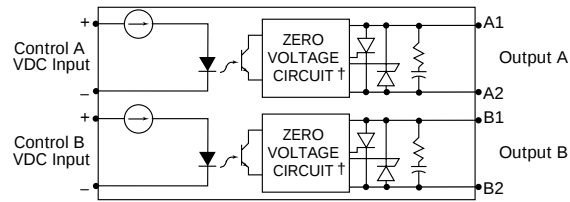
Parameter	Conditions	Units	25A Models	40A Models
Load Voltage Range V_L	$f = 47 - 63 \text{ Hz.}$	V rms	24-280	
Peak Voltage (Min.)	$t = 1 \text{ Min.}$	V peak	550	
Load Current Range I_L^*	Resistive	A rms	0.1-25	0.1-40
Single Cycle Surge Current (Max.)		A peak	500	780
One Second Surge Current (Max.)		A peak	150	234
Leakage Current (Off-State) (Max.)	$V_L = 280 \text{V rms}$	mA rms	0.1	
On-State Voltage Drop (Max.)	$I_L = \text{Max.}$	V peak	1.4	1.3
Static dv/dt (Off-State) (Min.)		V/ μs	500	
Thermal Resistance, Junction to Baseplate ($R_{\theta JB}$) (Max.)	Both Sections On	°C/W	0.6	0.6
Turn-On Time (Max.)	$f = 60 \text{ Hz.}$	ms	8.33 for Zero Voltage Turn-On Models <0.1 for Random Voltage Turn-On Models	
Turn-Off Time (Max.)	$f = 60 \text{ Hz.}$	ms	8.33	
I^2t Rating	$t = 8.3 \text{ ms}$	A ² Sec.	1,041	2,435
Load Power Factor Rating	$I_L = \text{Max.}$		0.5 - 1.0	

*See Derating Curves

Electrical Characteristics (Thermal Derating Curves)



Operating Diagram

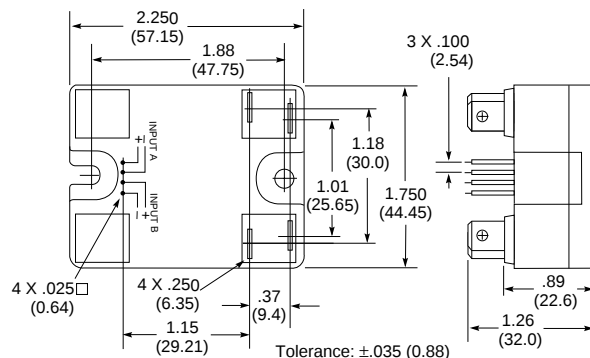


† Random Turn-on Units have a Random Turn-on circuit instead of Zero Voltage Circuit

Heatsink Recommendations

- We recommend that solid state relay modules be mounted to a heatsink sufficient to maintain the module's base temperature at less than 85°C under worst case ambient temperature and load conditions.
- The heatsink mounting surface should be a smooth (30-40 micro-inch finish), flat (30-40 micro-inch flatness across mating area), un-painted surface which is clean and free of oxidation.
- An even coating of thermal compound (Dow Corning DC340 or equivalent) should be applied to both the heatsink and module mounting surfaces and spread to a uniform depth of .002" to eliminate all air pockets.
- The module should be mounted to the heatsink using two #10 screws.

Outline Dimensions



Dimensions are shown for reference purposes only.

Dimensions are in inches over (millimeters) unless otherwise specified.

Specifications and availability subject to change.

www.tycoelectronics.com
Technical support:
Refer to inside back cover.



SSRQ series

Quad AC Output "Hockey Puck" Solid State Relay With Triac Outputs

cus File E29244

Users should thoroughly review the technical data before selecting a product part number. It is recommended that users also seek out the pertinent approvals files of the agencies/laboratories and review them to ensure the product meets the requirements for a given application.

Features

- Four independent AC output solid state relays in one standard package.
- 20A rms triac outputs.
- 4-15 VDC input control.
- Zero voltage and random voltage turn-on versions.
- 2500V rms optical isolation.
- Quick connect style terminals.

Engineering Data

Form: 4 Form A (4 SPST-NO).

Duty: Continuous.

Isolation: 2500V rms input-to-output-to-ground.

Capacitance: 10.0 pf maximum (input to output).

Temperature Range:

Storage: -40°C to +125°C

Operating: -40°C to + 80°C

Case Material: Plastic, UL rated 94V-0.

Case and Mounting: Refer to outline dimension.

Termination: Refer to outline dimension.

Approximate Weight: 3.5 oz. (98g).

Ordering Information

Sample Part Number ▶

SSRQ -240 D 20

1. Basic Series: SSRQ = Quad output SSR - 4 SPST - NO

2. Line Voltage: 240 = 24 - 280 VAC

3. Input Type & Voltage: D = 4 - 15VDC, zero voltage turn-on types.
R = 4 - 15VDC, random voltage turn-on types.

4. Maximum Switching Rating/Output: 20 = .05 - 20A rms, mounted to heatsink. NOTE: 60A max. per package.

5. Options: Blank = Zero voltage turn-on (all sections) Requires "D" input type above.
R = Random voltage turn-on (all sections) Requires "R" input type above.

Our authorized distributors are more likely to maintain the following items in stock for immediate delivery.

SSRQ-240D20

Input Specifications

Parameter	Conditions	Units	Zero V or Random V Turn-on Units
Control Voltage Range V_{IN}	@ 25°C	VDC	4-15
Must Operate Voltage $V_{IN(OP)}$ (Min.)	@ 25°C	VDC	4
Must Release Voltage $V_{IN(REL)}$ (Min.)	@ 25°C	VDC	1
Input Current (Typ.)	@ 25°C	mA DC	12
Input Impedance (Nom.)	@ 25°C	ohms	330

Output Specifications (@ 25° C, unless otherwise specified)

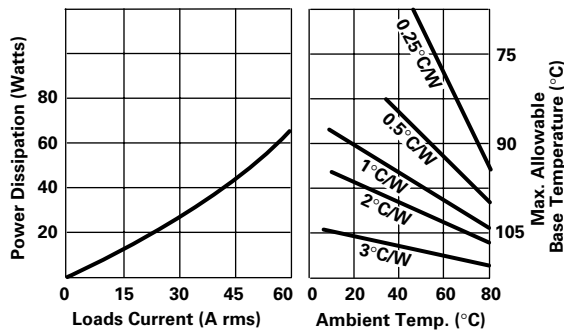
Parameter	Conditions	Units	
Load Voltage Range V_L		V rms	24-280
Repetitive Blocking Voltage (Min.)		V peak	±600
Load Current Range I_L^*	Resistive	A rms	.15-20
Single Cycle Surge Current (Min.)		A peak	250
Leakage Current (Off-State) (Max.)	$f = 60 \text{ Hz}$, $V_L = 280\text{Vrms}$	mA rms	10
On-State Voltage Drop (Max.)	$I_L = \text{Max.}$	V peak	1.6
Static dv/dt (Off-State) (Min.)	$V_L = 280\text{Vrms}$	V/ μs	200
Thermal Resistance, Junction to Case ($R_{\theta JC}$) (Max.)	All Sections On	°C/W	1.2
Turn-On Time (Max.)	$f = 60 \text{ Hz}$	ms	8.3 for Zero Voltage Turn-On Models 0.1 for Random Voltage Turn-On Models
Turn-Off Time (Max.)	$f = 60 \text{ Hz}$	ms	8.3
$I^2 t$ Rating	$t = 8.3 \text{ ms}$	A ² Sec.	260
Load Power Factor Rating	$I_L = \text{Max.}$		0.5 - 1.0

*See Thermal Derating Curves. Note: While each output section is rated for a maximum of 20A, the maximum output per package is 60A.

Electrical Characteristics (Thermal Derating Curves)

How To Use These Curves

Knowing maximum load current and maximum ambient temperature, use derating curves to determine required heat sink and maximum allowable base plate temperature. On left hand power dissipation curve, locate the point corresponding to maximum load current. Extend a line to the right from that point to the intersection of vertical line on right hand chart corresponding to maximum ambient temperature. From heat sink curve, read directly or extrapolate required heat sink size. Extend the line farther to the right and read on the right hand scale the maximum allowable base plate temperature.



Example #1:

Given: $I_L =$ Four 7.5A loads @ 60°C

Find: Minimum heatsink required

Solution: From Thermal Dissipation Graph

4 x 7.5A = 30A 4 sections ON

Heatsink = 2°C/W minimum

Example #2:

Given: SSRQ24020

Find: Maximum rating mounting to 10°C/W HS @ 60°C All sections ON

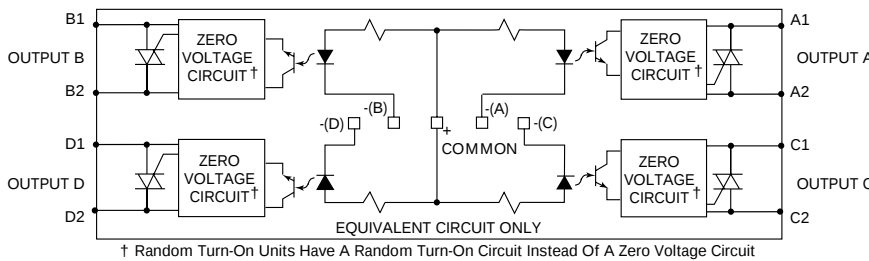
Solution: From Thermal Dissipation Graph

Rating mounted to 10°C/W HS @ 60°C = 36A total

9A for 4 Sections ON = 36A total

12A for 3 Sections ON = 36A total

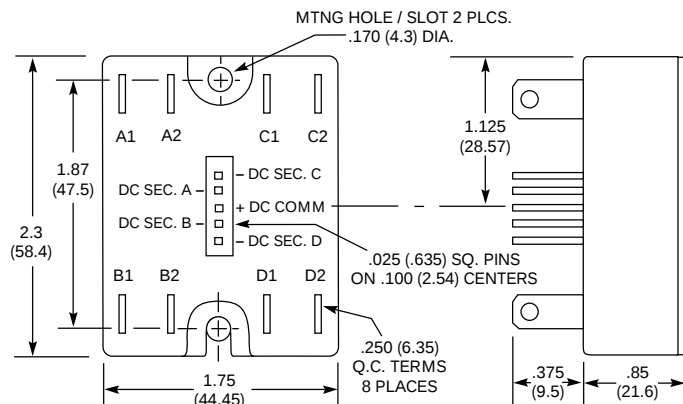
Operating Diagram



Heatsink Recommendations

- We recommend that solid state relay modules be mounted to a heatsink sufficient to maintain the module's base temperature at less than 85°C under worst case ambient temperature and load conditions.
- The heatsink mounting surface should be a smooth (30-40 micro-inch finish), flat (30-40 micro-inch flatness across mating area), un-painted surface which is clean and free of oxidation.
- An even coating of thermal compound (Dow Corning DC340 or equivalent) should be applied to both the heatsink and module mounting surfaces and spread to a uniform depth of .002" to eliminate all air pockets.
- The module should be mounted to the heatsink using two #10 screws.

Outline Dimensions

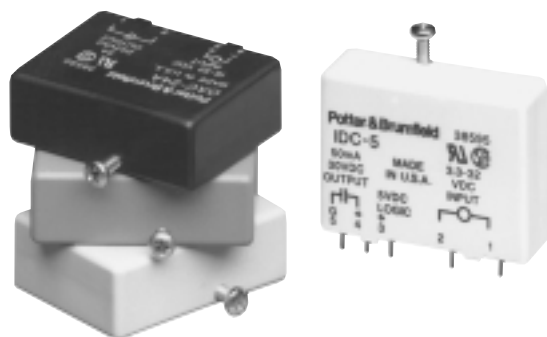


Dimensions are shown for reference purposes only.

Dimensions are in inches over (millimeters) unless otherwise specified.

Specifications and availability subject to change.

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Technical support:
Refer to inside back cover.



IAC/OAC IDC/ODC

Input/Output Modules

File E81606 & E29244

File LR38595M77

Users should thoroughly review the technical data before selecting a product part number. It is recommended that users also seek out the pertinent approvals files of the agencies/laboratories and review them to ensure the product meets the requirements for a given application.

Features

- Industry standard package and pin-out.
- Color coded by function.
- 4,000V rms optical isolation.
- High immunity to false operation.
- Series compatible.
- Output modules can be controlled from sinking or sourcing logic.
- Compatible with 2IO series mounting boards.

Engineering Data (all I/O modules)

Switch Form: 1 Form A (SPST-NO)

Duty: Continuous.

Isolation: 4,000V rms, 60 Hz.

Capacitance: 8 pF Typical (input to output).

Operating Temperature: -30°C to +80°C.

Storage Temperature: -40°C to +85°C.

Potting Compound Flammability: UL94V-0.

Approximate Weight: 1.38 oz. (35g).

Ordering Information

Typical Part Number ►

OAC

-5

H

1. Basic Series:

IAC = AC input module - yellow case
IDC = DC input module - white case
OAC = AC output module - black case
ODC = DC output module - red case

2. Input or Logic Voltage:

5 = 5VDC
15 = 15VDC
24 = 24VDC

3. Options:

Blank = IAC Type — 120VAC/VDC input (90-140VAC/VDC) * *
IDC Type — 3.3-32VDC input * *
OAC Type — 3A, 24-280VAC, zero voltage turn-on output
ODC Type — 3A, 3-60VDC output
A = IAC Type — 240VAC/VDC input (180-280VAC/VDC) * *
OAC Type — 3A, 24-280VAC, zero voltage turn-on output
ODC Type — 1A, 3-250VDC output
IDC Type — 10-60VDC input * *
E = IAC Type — 18-36VAC/VDC input * *
F = IDC Type — 4-32VDC input & fast turn-on & turn-off times * *
H = OAC Type — 5A, 24-280VAC, zero voltage turn-on output
R = OAC Type — 5A, 12-280VAC, random voltage turn-on output

* * Is not polarity sensitive.

Our authorized distributors are more likely to maintain the following items in stock for immediate delivery.

IAC-5	IDC-24	OAC-24A
IAC-5A	OAC-5	ODC-5
IAC-5E	OAC-5A	ODC-5A
IAC-15	OAC-5H	ODC-15
IAC-24	OAC-15	ODC-15A
IDC-5	OAC-24	ODC-24

IAC

AC Input Modules

Input Specifications

Parameter	Conditions	Units	IAC-5 IAC-15 IAC-24			IAC-5A IAC-15A IAC-24A			IAC-5E IAC-15E IAC-24E		
			Min.	Typ.	Max.	Min.	Typ.	Max.	Min.	Typ.	Max.
Control Voltage Range V_{IN}		VAC/VDC	90	120	140	180	240	280	18	24	36
Must Operate Voltage $V_{IN(OP)}$		VAC/VDC			90			180			18
Must Release Voltage $V_{IN(REL)}$		VAC/VDC	20			20			3		
Max. Input Current	@ V_{IN} =Max.	mA			6			6			18
Input Resistance		Ohms		28K			75K			2K	

Output Specifications (@ +25°C unless otherwise specified)

Parameter	Conditions	Units	IAC-5 IAC-5A IAC-5E			IAC-15 IAC-15A IAC-15E			IAC-24 IAC-24A IAC-24E		
			Min.	Typ.	Max.	Min.	Typ.	Max.	Min.	Typ.	Max.
Maximum Output Voltage		VDC			30			30			30
Maximum Output Current		mADC			50			50			50
Maximum Output Leakage Current	V_{OUT} =Max.	μADC			10			10			10
Maximum Output Voltage Drop	I_{SINK} =50mA	VDC			.2			.2			.2
Logic Supply Voltage V_{CC}		VDC	3	5	6	12	15	18	20	24	30
Logic Supply Current	V_{CC} =Max.	mADC			18			18			18
Turn-On Time (Nominal)	I_{SINK} =25mA	ms			20			20			20
Turn-Off Time (Nominal)	I_{SINK} =25mA	ms			30			30			30
Output Type (Open Collector)			Normally Open($I_{SINKING}$)			Normally Open($I_{SINKING}$)			Normally Open($I_{SINKING}$)		

OAC

AC Output Modules

Input Specifications

Parameter	Conditions	Units	OAC-5 OAC-5A OAC-5H OAC-5R			OAC-15 OAC-15A OAC-15H OAC-15R			OAC-24 OAC-24A OAC-24H OAC-24R		
			Min.	Typ.	Max.	Min.	Typ.	Max.	Min.	Typ.	Max.
Control Voltage Range V_{IN}		VDC	3	5	8	9	15	18	18	24	32
Must Operate Voltage $V_{IN(OP)}$		VDC			3			9			18
Must Release Voltage $V_{IN(REL)}$		VDC	1			1			1		
Maximum Input Current	@ V_{IN} =Nominal	mADC			20			16			13
Input Resistance R_{IN}		Ohms		220			1000			2000	

PIN-3 must be positive with respect to PIN-4 for correct operation.

Output Specifications (47 to 63 Hz., @ +25°C unless otherwise specified)

Parameter	Conditions	Units	OAC-5 OAC-5A OAC-15 OAC-15A OAC-24 OAC-24A			OAC-5H IAC-15H OAC-24H			OAC-5R OAC-15R OAC-24R		
			Min.	Typ.	Max.	Min.	Typ.	Max.	Min.	Typ.	Max.
Load Voltage V_L		V rms	24	120/240	280	24	120/240	280	24	120/240	280
Repetitive Blocking Voltage		V peak			±600			±600			±600
Load Current I_L *		A rms	.05		3	.05		5	.05		5
Output Current		mA/°C		58mA/°C			66mA/°C			66mA/°C	
Derating				40°C - 80°C			30°C - 80°C			30°C - 80°C	
Single Cycle surge Current		A peak			100			250			250
Leakage Current (Off-State)	V_L =120VAC	mA rms			1			1			1
@ 60 Hz.	V_L =240VAC	mA rms			2			2			2
On-State Voltage Drop	I_L =Max.	V peak			1.6			1.6			1.6
Static dv/dt (Off-State)		V/μs			200			200			200
Turn-On Time	@f=60 Hz.	ms			8.3			8.3			.1
Turn-Off Time		ms			8.3			8.3			8.3
Output Type (Form)			Normally Open 1A			Normally Open 1A			Normally Open 1A		
H/P/ Rating @ 240VAC			1/4HP			1/2HP			1/2HP		

IDC

DC Input Modules

Input Specifications

Parameter	Conditions	Units	IDC-5 IDC-15 IDC-24			IDC-5A IDC-15A IDC-24A			IDC-5F IDC-15F IDC-24F		
			Min.	Typ.	Max.	Min.	Typ.	Max.	Min.	Typ.	Max.
Control Voltage Range V_{IN}		VDC	±3.3	±24	±32	±10		±60	±4		±32
Must Operate Voltage $V_{IN(OP)}$		VDC			±3.3			±10			±4
Must Release Voltage $V_{IN(REL)}$		VDC	±2			±3			±1		
Maximum Input Current	@ V_{IN} =Max.	mA		34			34			68	
Input Resistance		Ohms		1K			2K			500	

Output Specifications (@ +25°C unless otherwise specified)

Parameter	Conditions	Units	IDC-5 IDC-5A			IDC-15 IDC-15A			IDC-24 IDC-24A			IDC-5F			IDC-15F			IDC-24F		
			Min	Typ	Max	Min	Typ	Max	Min	Typ	Max	Min	Typ	Max	Min	Typ	Max	Min	Typ	Max
Maximum Output Voltage		VDC			30			30			30			30			30			30
Maximum Output Current		mADC			50			50			50			50			50			50
Maximum Output Leakage Current	V_{OUT} =Max.	μADC			10			10			10			10			10			10
Maximum Output Voltage Drop	I_{SINK} =50mA	VDC			.2			.2			.2			.2			.2			.2
Logic Supply Voltage V_{CC}		VDC	3	5	6	12	15	18	20	24	30	3	5	6	12	15	18	20	24	30
Logic Supply Current	V_{CC} =Max.	mADC			18			18			18			18			18			18
Turn-On Time (Nominal)	I_{SINK} =25mA	ms		1*			1*			1*			.05			.05			.05	
Turn-Off Time (Nominal)	I_{SINK} =25mA	ms		1*			1*			1*			.10			.10			.10	
Output Type (Open Collector)			Normally Open (SINKING)			Normally Open (SINKING)			Normally Open (SINKING)			Normally Open (SINKING)			Normally Open (SINKING)			Normally Open (SINKING)		

* Nominal Turn-On and Turn-Off times for IDC5A, IDC15A & IDC24A are 5 ms.

ODC

DC Output Modules

Input Specifications

Parameter	Conditions	Units	ODC-5 ODC-5A			ODC-15 ODC-15A			ODC-24 ODC-24A		
			Min.	Typ.	Max.	Min.	Typ.	Max.	Min.	Typ.	Max.
Control Voltage Range V_{IN}		VDC	3	5	8	9	15	18	18	24	32
Must Operate Voltage $V_{IN(OP)}$		VDC			3			9			18
Must Release Voltage $V_{IN(REL)}$		VDC	1			1			1		
Maximum Input Current	@ V_{IN} =Nominal	mADC			18			16			13
Input Resistance R_{IN}		Ohms			250			1000			2000

PIN-3 must be positive with respect to PIN-4 for correct operation.

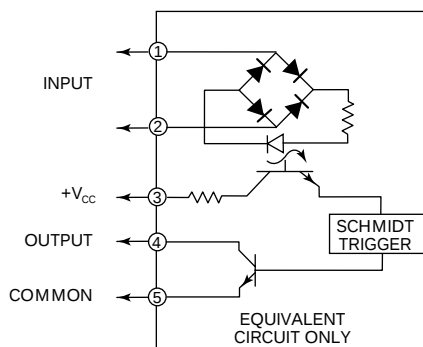
Output Specifications (@ +25°C unless otherwise specified)

Parameter	Conditions	Units	ODC-5 ODC-24 ODC-15			ODC-5A ODC-24A ODC-15A		
			Min.	Typ.	Max.	Min.	Typ.	Max.
Load Voltage V_L		VDC	3		60	3		250
Load Current I_L		ADC	.01		3	.01		1
Maximum Surge Current for 1 Second		ADC			5			5
Maximum Leakage Current (Off-State)	V_L =MAX	μADC			500			2000
Maximum On-State Voltage Drop	I_L =MAX	VDC			15			15
Maximum Turn-On Time		ms			.1			.1
Maximum Turn-Off Time		ms			.75			.75

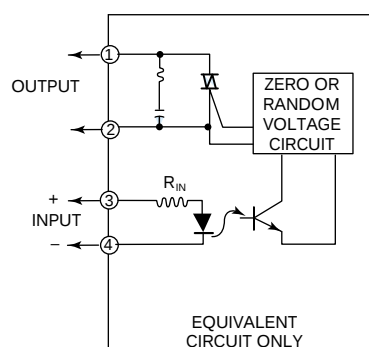
At 40°C, derate by 50mA/°C to 80°C.

PIN-1 must be positive with respect to PIN-2 for correct operation.

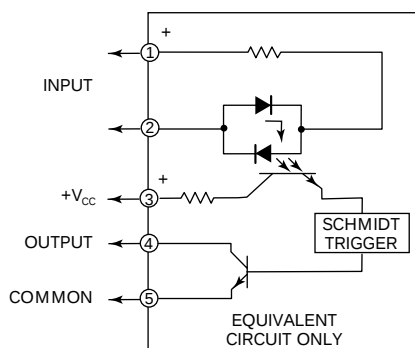
IAC Operating Diagram



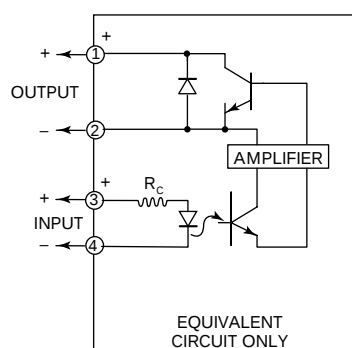
OAC Operating Diagram



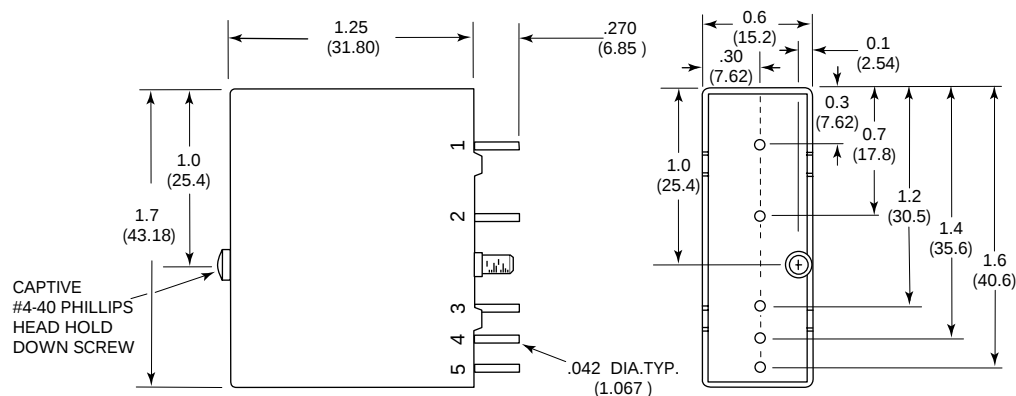
IDC Operating Diagram



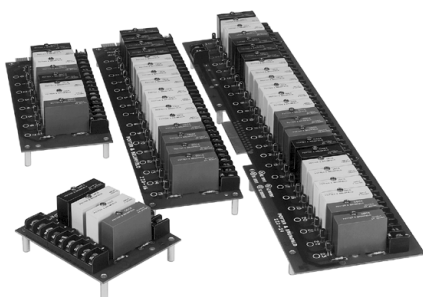
ODC Operating Diagram



Outline Dimensions



Note: Pin 5 is not present on Output Modules.



2IO series

Mounting Boards for Input/Output Modules

- LED status indicators, plug-in fuses & pull-up resistors
- Card edge logic connections (2IO8, 2IO16 & 2IO24)
- Screw terminal logic connections (2IO4A, 2IO4B, 2IO4C, 2IO16A, 2IO16B & 2IO16C)
- Screw terminals for field wiring
- UL recognized/CSA certified for 125V max. with 5A fuses; 250V max. with #22 solid copper jumper wire instead of fuses

File E61482

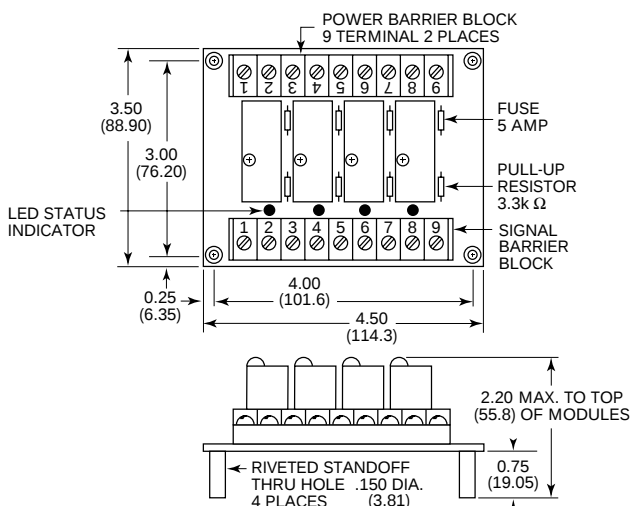
File LR15734-93

Users should thoroughly review the technical data before selecting a product part number. It is recommended that users also seek out the pertinent approvals files of the agencies/laboratories and review them to ensure the product meets the requirements for a given application.

Ordering Information – Boldface items listed below are more likely to be maintained in stock by authorized distributors.

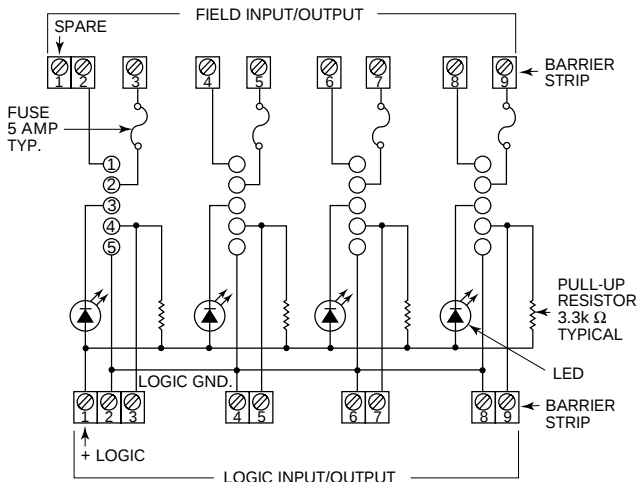
Part Number	2IO4A	2IO4B	2IO4C	2IO8	2IO16	2IO16A	2IO16B	2IO16C	2IO24
Number of I/O Channels	4	4	4	8	16	16	16	16	24
Number of Module Positions	4	4	4	8	16	16	16	16	24
Field Terminals: Screw Terminals	X	X	X	X	X	X	X	X	X
Logic Terminals: Screw Terminals	X	X	X			X	X	X	
Logic Terminals: 26-pin card edge connector				X					
Logic Terminals: 50-pin card edge connector				X	X				X
Designed for neg. true logic; one logic voltage	X			X	X	X			X
Designed for neg. or pos. true logic; mult. logic voltages		X					X		
Designed for neg. true logic; mult. logic voltages			X					X	

2IO4A, 2IO4B & 2IO4C Outline Dimensions



2IO4A Schematic

Designed to operate with neg. true logic (active low) systems & one logic voltage.



Mating Connectors and Fuses

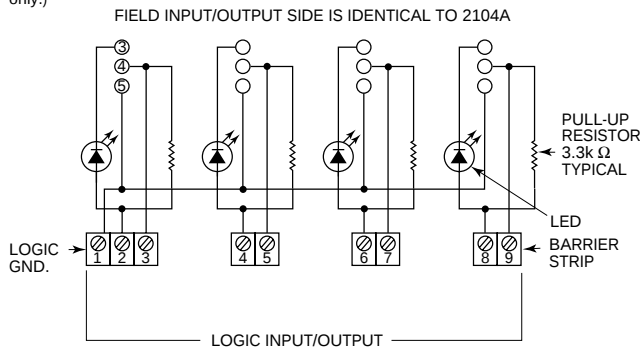
26-pin card edge connector	Thomas & Betts 622-2615*
50-pin card edge connector	Thomas & Betts 622-5015*
5 amp fuse	Littelfuse 251-005*
1 amp fuse**	Littelfuse 251-001*

* Or equivalent

** Used on 2IO24 only.

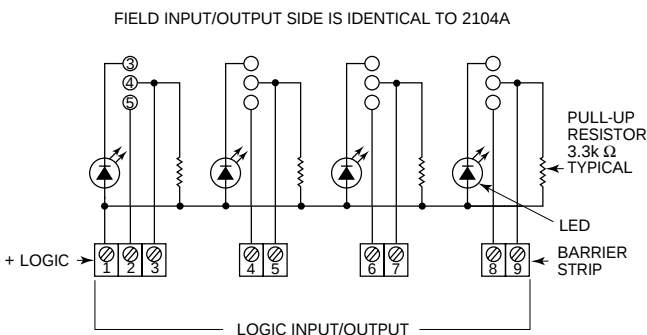
2IO4B Schematic

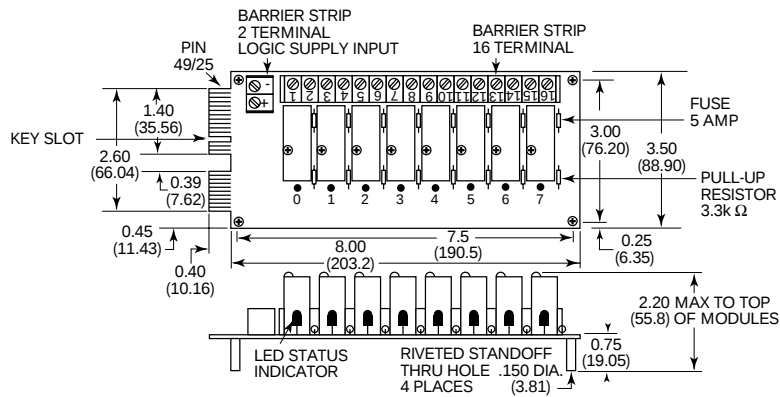
Designed to operate with either neg. or pos. true logic (active low or high) systems & different logic voltages. (output modules only - input modules must be used in negative logic systems only.)



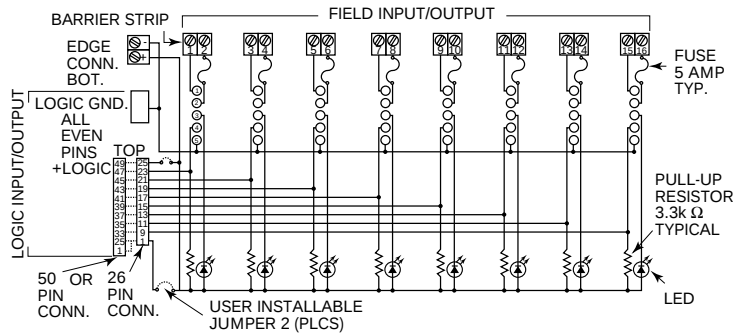
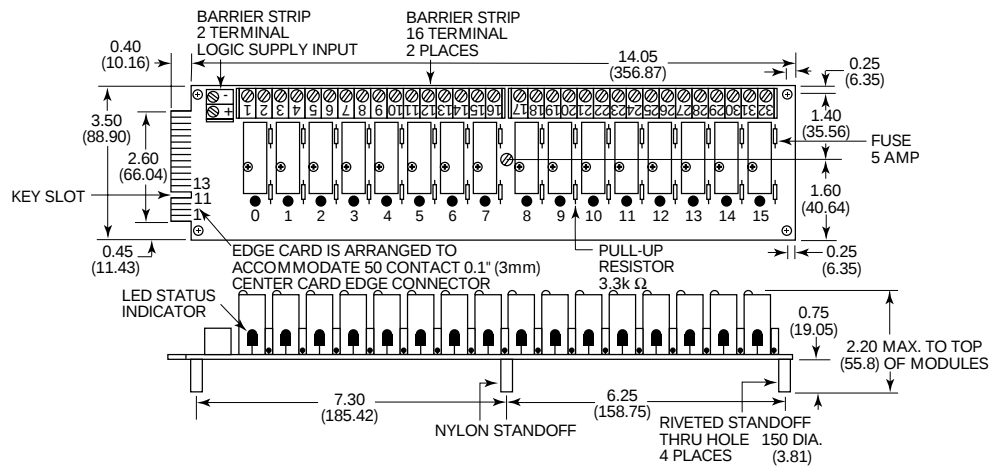
2IO4C Schematic

Designed to operate with neg. true logic (active low) systems & different logic voltages.

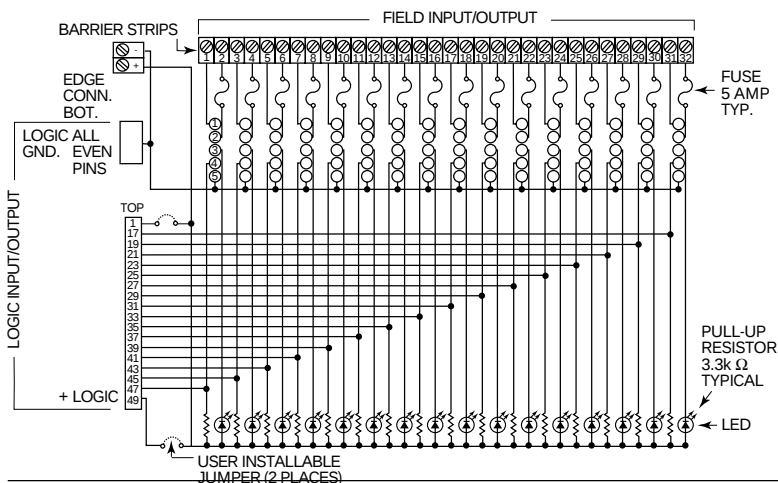


2IO8 Outline Dimensions**2IO8 Schematic**

Designed to operate with neg. true logic (active low) systems & one logic voltage.

**2IO16 Outline Dimensions****2IO16 Schematic**

Designed to operate with neg. true logic (active low) systems & one logic voltage.



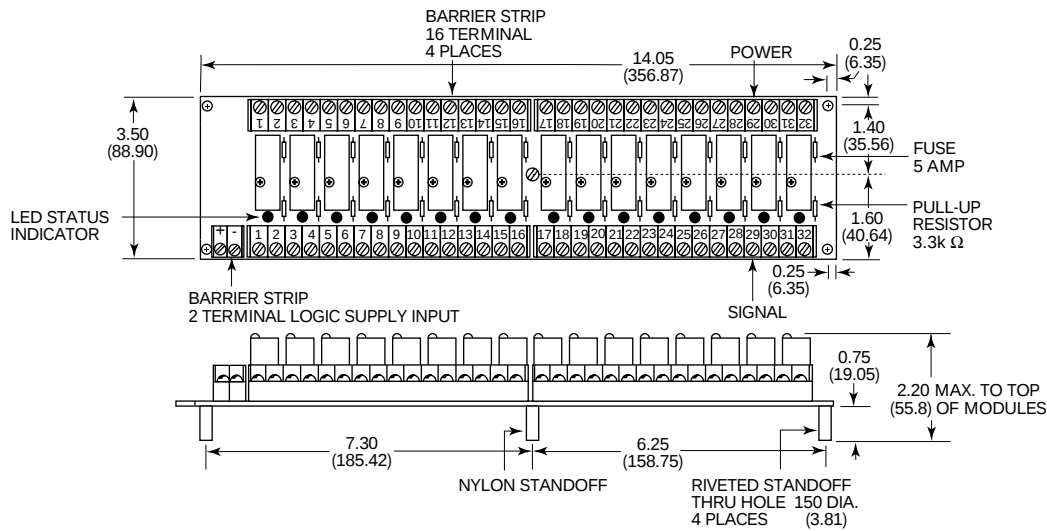
Dimensions are shown for reference purposes only.

Dimensions are in inches over (millimeters) unless otherwise specified.

Specifications and availability subject to change.

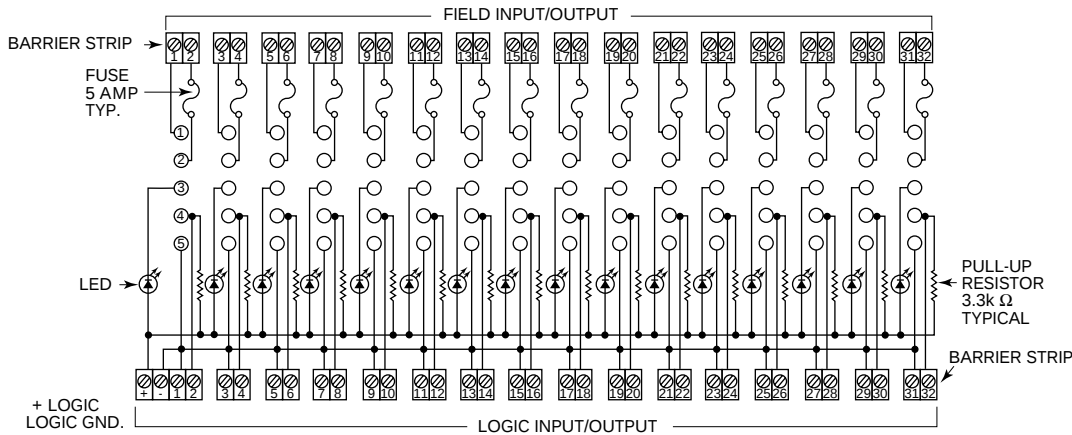
www.tycoelectronics.com
Technical support:
Refer to inside back cover.

2IO16A, 2IO16B & 2IO16C Outline Dimensions



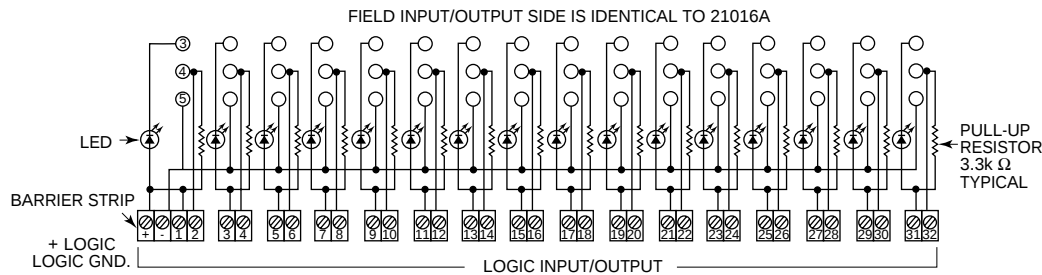
2IO16A Schematic

Designed to operate with neg. true logic (active low) systems & one logic voltage.



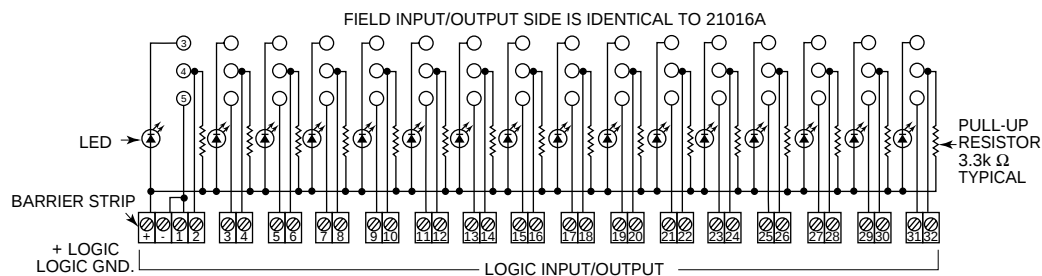
2IO16B Schematic

Designed to operate with either neg. or pos. true logic (active low or high) systems & different logic voltages.
(Note above applies to output modules only. Input modules must use in negative logic systems only.)

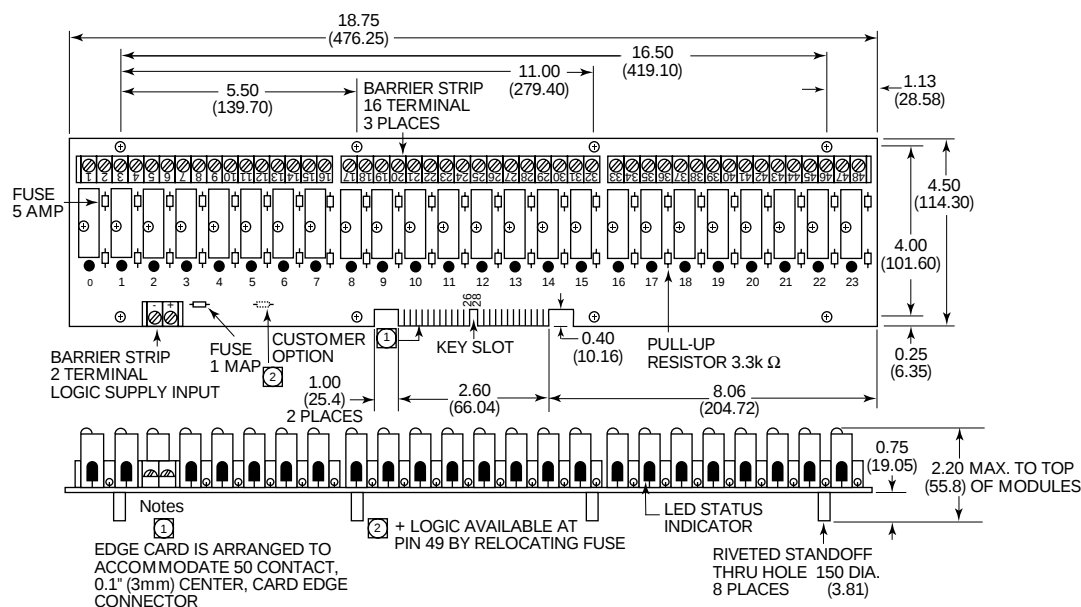


2IO16C Schematic

Designed to operate with neg. true logic (active low) systems & different logic voltages.

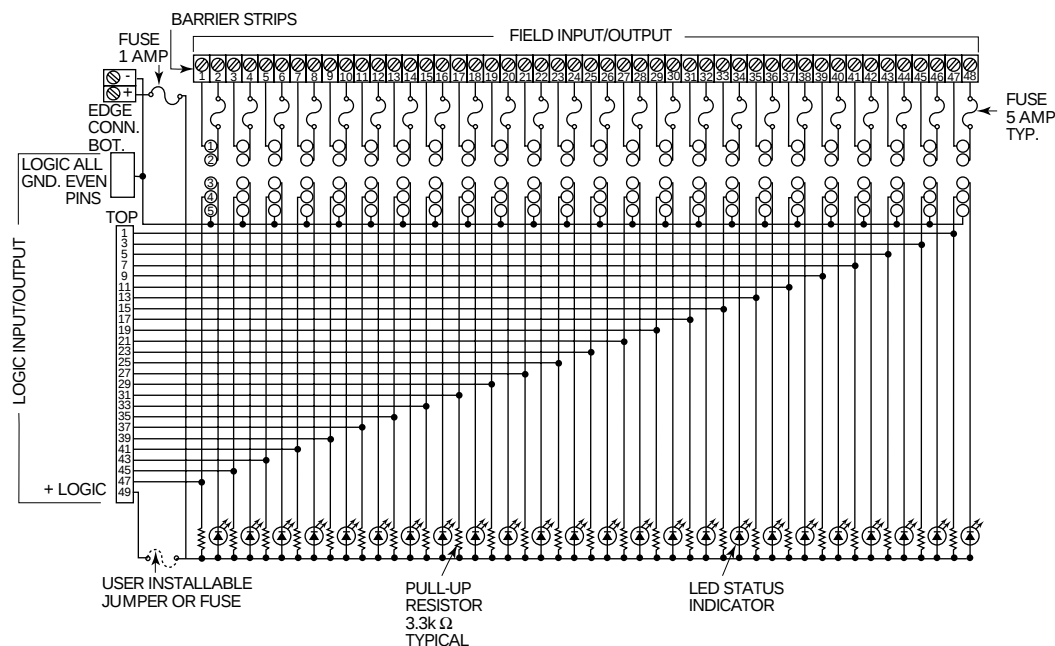


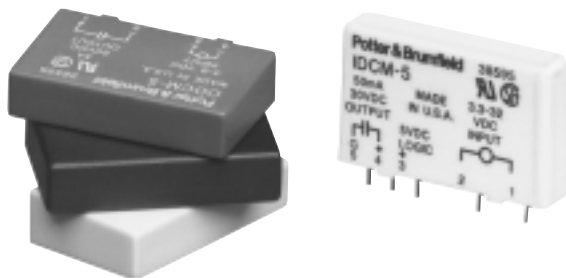
21024 Outline Dimensions



2IO24 Schematic

Designed to operate with neg. true logic (active low) systems & one logic voltage.





IACM/OACM IDCM/ODCM

Slim Line Input/Output Modules

File E81606 & E29244

File LR38595M77

Users should thoroughly review the technical data before selecting a product part number. It is recommended that users also seek out the pertinent approvals files of the agencies/laboratories and review them to ensure the product meets the requirements for a given application.

Features

- Slim line .4" (10.16mm) thick package.
- Foot print same as .6" (15.24mm) thick package.
- 4,000V rms optical isolation.
- Color coded by function.
- High immunity to false operation.
- Series compatible.
- Output modules can be controlled from sinking or sourcing logic.
- Compatible with 2IOM series mounting boards.

Engineering Data (all I/O modules)

Switch Form: 1 Form A (SPST-NO)

Duty: Continuous.

Capacitance: 8 pF Typical (input to output).

Operating Temperature: -30°C to +80°C.

Storage Temperature: -40°C to +85°C.

Potting Compound Flammability: UL94V-0.

Solderability: 260°C for 5 seconds, maximum.

Approximate Weight: .87 oz. (22.1g).

Ordering Information

Typical Part Number ►

OACM -5 H

1. Basic Series:

IACM = Slim line AC input module — yellow case
IDCM = Slim line DC input module — white case
OACM = Slim line AC output module — black case
ODCM = Slim line DC output module — red case

2. Input or Logic Voltage:

5 = 5VDC
15 = 15VDC
24 = 24VDC
U = OACM & ODCM Types 3-15VDC input voltage

3. Options:

Blank = IACM Type — 120VAC/VDC input (90-140VAC/VDC) * * <None>
IDCM Type — 3.3-32VDC input * *
OACM Type — 3A, 24-280VAC, zero voltage turn-on output
ODCM Type — 3A, 3-60VDC output
A = IACM Type — 240VAC/VDC input (180-280VAC/VDC) * *
IDCM Type — 10-60VDC input * *
OACM Type — 3A, 24-280VAC
ODCM Type — 1A, 5-250VDC output
E = IACM Type — 18-36VAC/VDC input * *
F = IDCM Type — 4-32VDC input & fast turn-on & turn-off times * *
H = OACM Type — 5A, 24-280VAC, zero voltage turn-on output

* * Is not polarity sensitive.

Our authorized distributors are more likely to maintain the following items in stock for immediate delivery.

IACM-5 OACM-5H
IACM-5A OACM-U
IDCM-5 OACM-UH
OACM-5 ODCM-5

IACM

AC Input Modules

Input Specifications

Parameter	Conditions	Units	IACM-5 IACM-15 IACM-24			IACM-5A IACM-15A IACM-24A			IACM-5E IACM-15E IACM-24E		
			Min.	Typ.	Max.	Min.	Typ.	Max.	Min.	Typ.	Max.
Control Voltage Range V_{IN}		VAC/VDC	90	120	140	180	240	280	18	24	36
Must Operate Voltage $V_{IN(OP)}$		VAC/VDC			90			180			18
Must Release Voltage $V_{IN(REL)}$		VAC/VDC	20			20			3		
Max. Input Current	@ V_{IN} =Max.	mA			6			6			18
Input Resistance R_{IN}		Ohms		28K			75K			2K	

Output Specifications (@ +25°C unless otherwise specified)

Parameter	Conditions	Units	IACM-5 IACM-5A IACM-5E			IACM-15 IACM-15A IACM-15E			IACM-24 IACM-24A IACM-24E		
			Min.	Typ.	Max.	Min.	Typ.	Max.	Min.	Typ.	Max.
Maximum Output Voltage		VDC			30			30			30
Maximum Output Current I_{SINK}		mADC			50			50			50
Maximum Output Leakage Current	V_{OUT} =Max.	μ ADC			10			10			10
Maximum Output Voltage Drop	I_{SINK} =50mA	VDC			.2			.2			.2
Logic Supply Voltage V_{CC}		VDC	3	5	6	12	15	18	20	24	30
Maximum Logic Supply Current	V_{CC} =Max.	mADC			18			18			18
Turn-On Time (Nominal)	I_{SINK} =25mA	ms			20			20			20
Turn-Off Time (Nominal)	I_{SINK} =25mA	ms			30			30			30
Output Type (Open Collector)			Normally Open (Sinking)			Normally Open (Sinking)			Normally Open (Sinking)		

OACM

AC Output Modules

Input Specifications

Parameter	Conditions	Units	OACM-5 OACM-5H OACM-5R			OACM-15 OACM-15H OACM-15R			OACM-24 OACM-24H OACM-24R			OACM-U OACM-UH OACM-UH		
			Min.	Typ.	Max.	Min.	Typ.	Max.	Min.	Typ.	Max.	Min.	Typ.	Max.
Control Voltage Range V_{IN}		VDC	3	5	8	9	15	18	18	24	32	3	5	15
Must Operate Voltage $V_{IN(OP)}$		VDC			3			9			18			3
Must Release Voltage $V_{IN(REL)}$		VDC	1			1			1			1		
Input Current	@ V_{IN} =Nominal	mADC			20			16			13			44
Input Resistance R_{IN}		Ohms		220			1000			2000			360	

PIN-3 must be positive with respect to PIN-4 for correct operation.

Output Specifications (47 to 63 Hz., @ +25°C unless otherwise specified)

Parameter	Conditions	Units	OACM-5 OACM-15 OACM-24 OACM-U			OACM-5H IAC-15H OAC-24H OACM-UH			OACM-5R OACM-15R OACM-24R OACM-UR		
			Min.	Typ.	Max.	Min.	Typ.	Max.	Min.	Typ.	Max.
Load Voltage V_L		V rms	24	120/240	280	24	120/240	280	24	120/240	280
Repetitive Blocking Voltage		V peak			± 600			± 600			± 600
Load Current I_L *		A rms	.05		3	.05		5	.05		5
Output Current		mA/°C		58mA/°C			66mA/°C			66mA/°C	
Derating				40°C - 80°C			30°C - 80°C			30°C - 80°C	
Single Cycle Surge Current		A peak			100			250			250
Leakage Current (Off-State)	V_L =120VAC	mA rms			1			1			1
	V_L =240VAC	mA rms			2			2			2
On-State Voltage Drop	I_L =Max.	V peak			1.6			1.6			1.6
Static dv/dt (Off-State)		V/ μ s			200			200			200
Turn-On Time	@ f=60 Hz.	ms			8.3			8.3			.1
Turn-Off Time		ms			8.3			8.3			8.3
H/P/ Rating	@ 240VAC	HP			1/4			1/2			1/2

IDCM

DC Input Modules

Input Specifications

Parameter	Conditions	Units	IDCM-5 IDCM-15 IDCM-24			IDCM-5A IDCM-15A IDCM-24A			IDCM-5F IDCM-15F IDCM-24F		
			Min.	Typ.	Max.	Min.	Typ.	Max.	Min.	Typ.	Max.
Control Voltage Range V_{IN}		VDC	±3.3	±24	±32	±10		±60	±4		±32
Must Operate Voltage $V_{IN(OP)}$		VDC			±3.3			±10			±4
Must Release Voltage $V_{IN(REL)}$		VDC	±2			±3			±1		
Maximum Input Current	@ V_{IN} =Max.	mA		34			34			68	
Input Resistance R_{IN}		Ohms		1000			2000			500	

Output Specifications (@ +25°C unless otherwise specified)

Parameter	Conditions	Units	IDCM-5 IDCM-5A			IDCM-15 IDCM-15A			IDCM-24 IDCM-24A			IDCM-5F			IDCM-15F			IDCM-24 IDCM-24F		
			Min	Typ	Max	Min	Typ	Max	Min	Typ	Max	Min	Typ	Max	Min	Typ	Max	Min	Typ	Max
Maximum Output Voltage		VDC			30			30			30			30			30			30
Maximum Output Current		mADC			50			50			50			50			50			50
Maximum Output Leakage Current	V_{OUT} =Max.	µADC			10			10			10			10			10			10
Maximum Output Voltage Drop	I_{SINK} =50mA	VDC			.2			.2			.2			.2			.2			.2
Logic Supply Voltage V_{CC}		VDC	3	5	6	12	15	18	20	24	30	3	5	6	12	15	18	20	24	30
Logic Supply Current	V_{CC} =Max.	mADC			18			18			18			18			18			18
Turn-On Time (Nominal)		ms		1*			1*			1*		.05		.05		.05		.05		.05
Turn-Off Time (Nominal)		ms		1*			1*			1*		.10		.10		.10		.10		.10
Output Type (Open Collector)			Normally Open (SINKING)			Normally Open (SINKING)			Normally Open (SINKING)			Normally Open (SINKING)			Normally Open (SINKING)			Normally Open (SINKING)		

* Nominal Turn-On and Turn-Off times for IDCM5A, IDCM15A & IDCM24A are 5 ms.

ODCM

DC Output Modules

Input Specifications

Parameter	Conditions	Units	ODCM-5 ODCM-5A			ODCM-15 ODCM-15A			ODCM-24 ODCM-24A			ODCM-U ODCM-UA		
			Min.	Typ.	Max.	Min.	Typ.	Max.	Min.	Typ.	Max.	Min.	Typ.	Max.
Control Voltage Range V_{IN}		VDC	3	5	8	9	15	18	18	24	32	3	5	15
Must Operate Voltage $V_{IN(OP)}$		VDC			3			9			18			3
Must Release Voltage $V_{IN(REL)}$		VDC	1			1			1			1		
Maximum Input Current	@ V_{IN} =Nominal	mADC			18			16			13			44
Input Resistance R_{IN}		Ohms		250			1000			2000			360	

PIN-3 must be positive with respect to PIN-4 for correct operation.

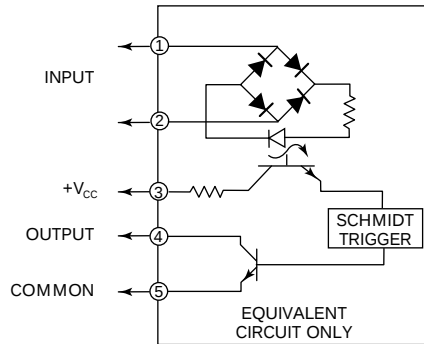
Output Specifications (@ +25°C unless otherwise specified)

Parameter	Conditions	Units	ODCM-5 ODCM-15 ODCM-24 ODCM-U			ODCM-5A ODCM-15A ODCM-24A ODCM-UA		
			Min.	Typ.	Max.	Min.	Typ.	Max.
Load Voltage V_L		VDC	3		60	3		250
Load Current I_L *		ADC	.01		3	.01		1
Maximum Surge Current for 1 Second		ADC			5			5
Maximum Leakage Current (Off-State)	V_L =MAX	µADC			500			2000
Maximum On-State Voltage Drop	I_L =MAX	VDC			15			15
Maximum Turn-On Time		ms			.1			.1
Maximum Turn-Off Time		ms			.75			.75

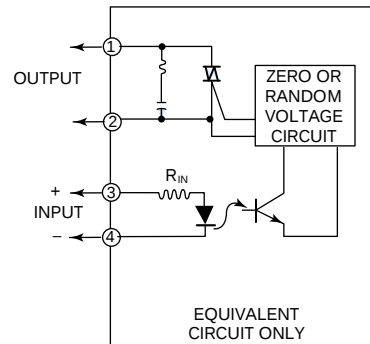
* Above 40°C, derate by 50mA/°C to 80°C.

PIN-1 must be positive with respect to PIN-2 for correct operation.

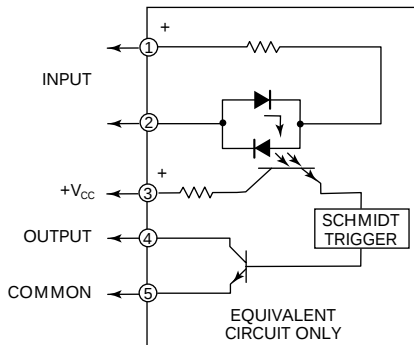
IACM Operating Diagram



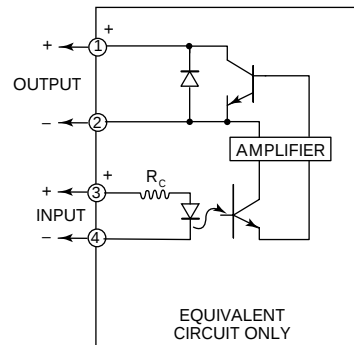
OACM Operating Diagram



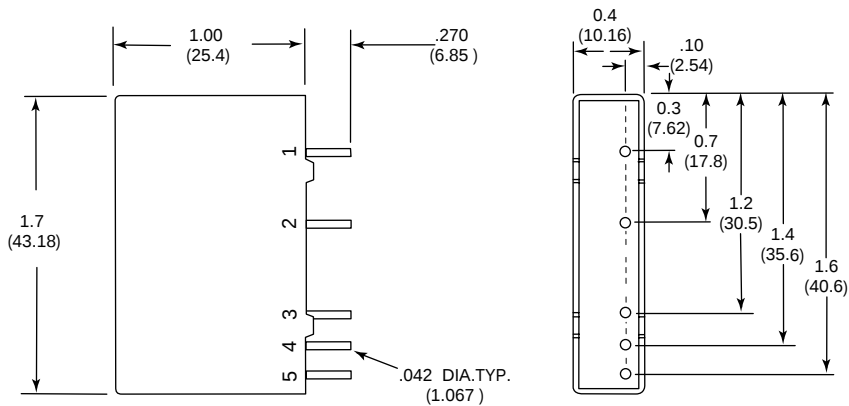
IDCM Operating Diagram



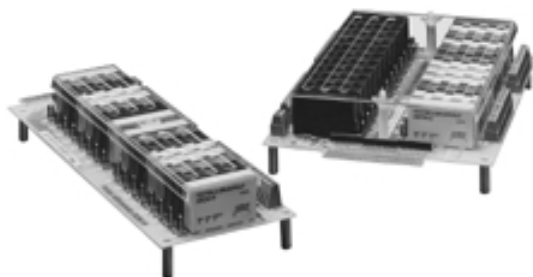
ODCM Operating Diagram



Outline Dimensions



Note: Pin 5 is not present on Output Modules.



210M series

Space Saving Mounting Boards for Slim Line Input/Output Modules

- LED status indicators, plug-in fuses & pull-up resistors
- Card edge, straight header, right-angle header and screw terminal logic connections
- Screw terminals for field wiring
- UL recognized/CSA certified for 125V max. with 5A fuses; 250V max. with #22 solid copper jumper wire instead of fuses

File E61482

File LR15734

Users should thoroughly review the technical data before selecting a product part number. It is recommended that users also seek out the pertinent approvals files of the agencies/laboratories and review them to ensure the product meets the requirements for a given application.

Ordering Information - Boldface items listed below are more likely to be maintained in stock by authorized distributors.

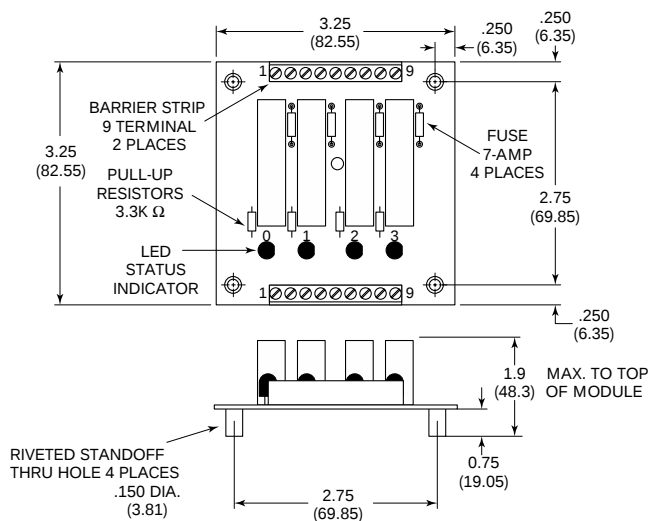
Part Number	2IOM4A	2IOM16	2IOM16A	2IOM16E	2IOM24	2IOM24D	2IOM32D
Number of I/O Channels	4	16	16	16	24	24	32
Number of Module Positions	4	16	16	16	24	24	32
Field Terminals: Screw Terminals	X	X	X	X	X	X	X
Logic Terminals: Screw Terminals	X		X				
Logic Terminals: 50-pin card edge connector		X			X	X	
Logic Terminals: 50-pin straight header						X	X
Logic Terminals: 50-pin right angle header				X			
Will accept 50-pin dual row header		X			X		
Designed for neg. true logic; one logic voltage	X	X	X	X	X	X	X

Mating Connectors and Fuses

50-pin card edge connector	Thomas & Betts 622-5015 ¹
50-pin header connector	Thomas & Betts 609-5030 ¹
5 amp fuse	Littelfuse 251-005 ¹
7 amp fuse ³	Littelfuse 251-007 ¹
1 amp fuse ²	Littelfuse 251-001 ¹

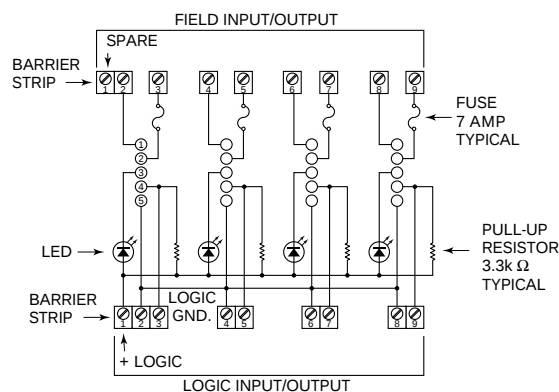
Notes: 1. Or equivalent.
2. Used only on 24 and 32 position models.
3. Used only on 2IOM4A and 2IOM16A.

2IOM4A Outline Dimensions

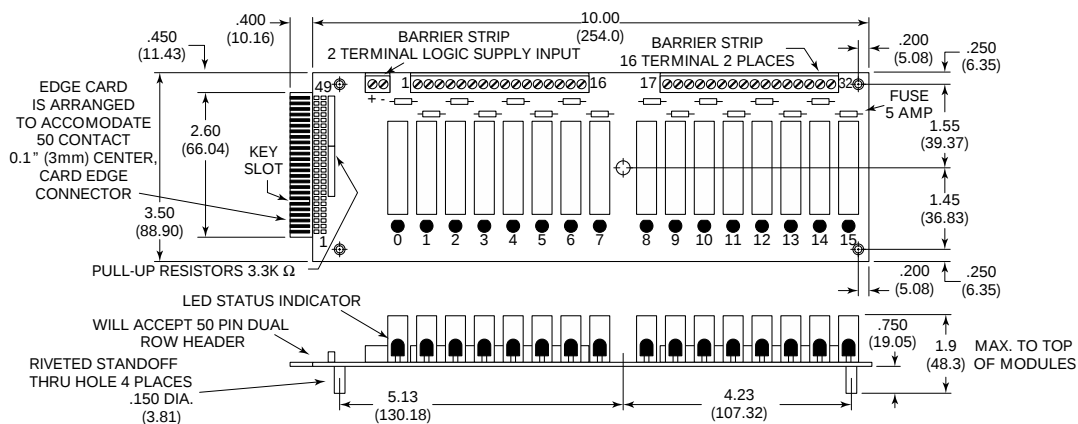


2IOM4A Schematic

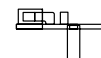
Designed to operate with neg. true logic (active low) systems & one logic voltage.



2IOM16 & 2IOM16E Outline Dimensions

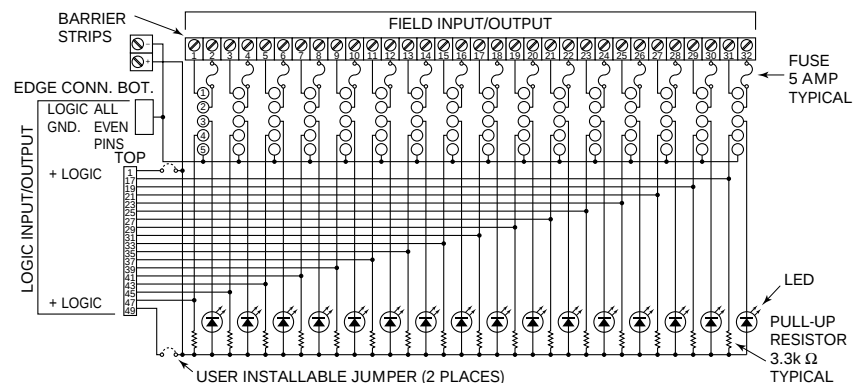


2IOM16E With Right-Angle Header

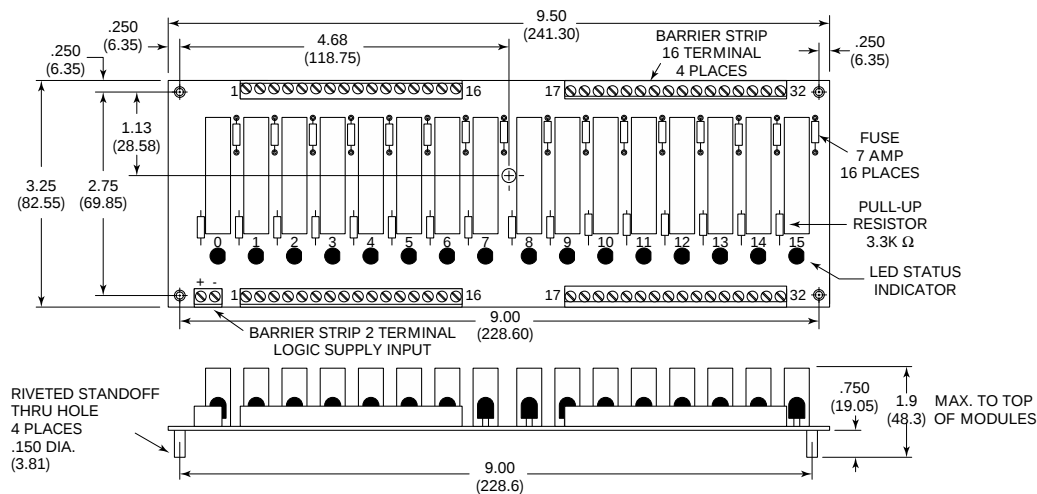


2IOM16 & 2IOM16E Schematic

Designed to operate with neg. true logic (active low) systems & one logic voltage.

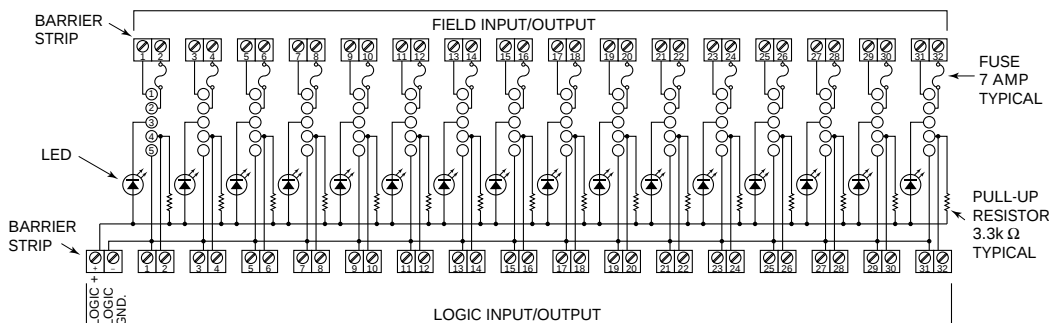


2IOM16A Outline Dimensions

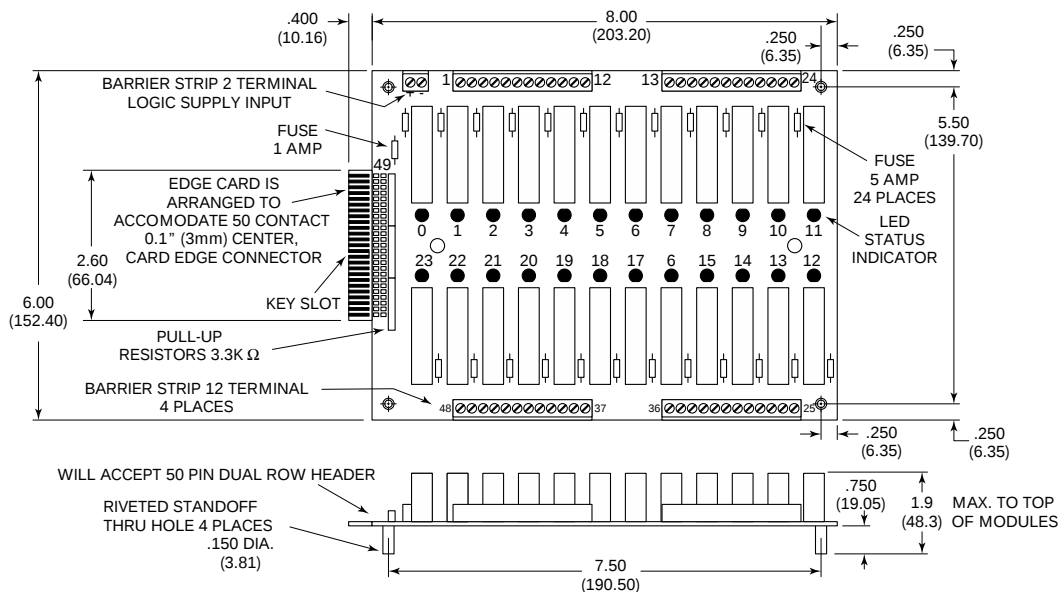


2IOM16A Schematic

Designed to operate with neg. true logic (active low) systems & one logic voltage.

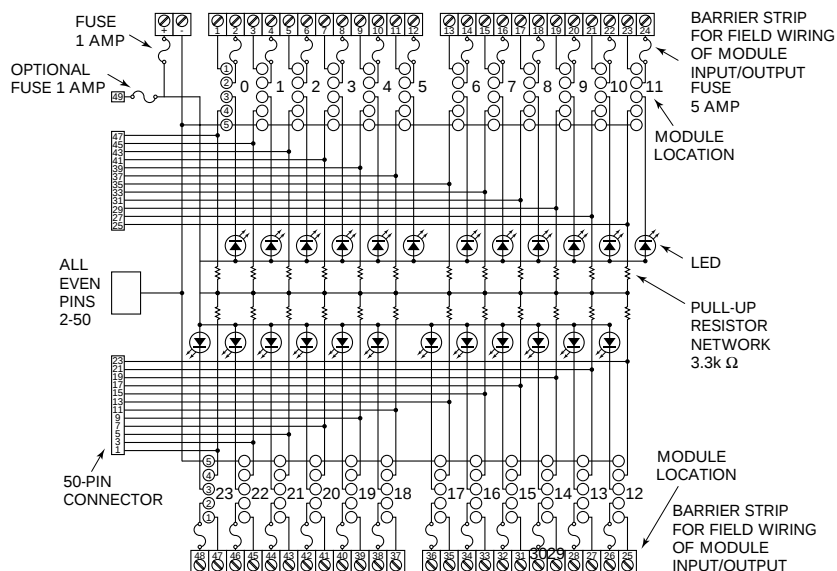


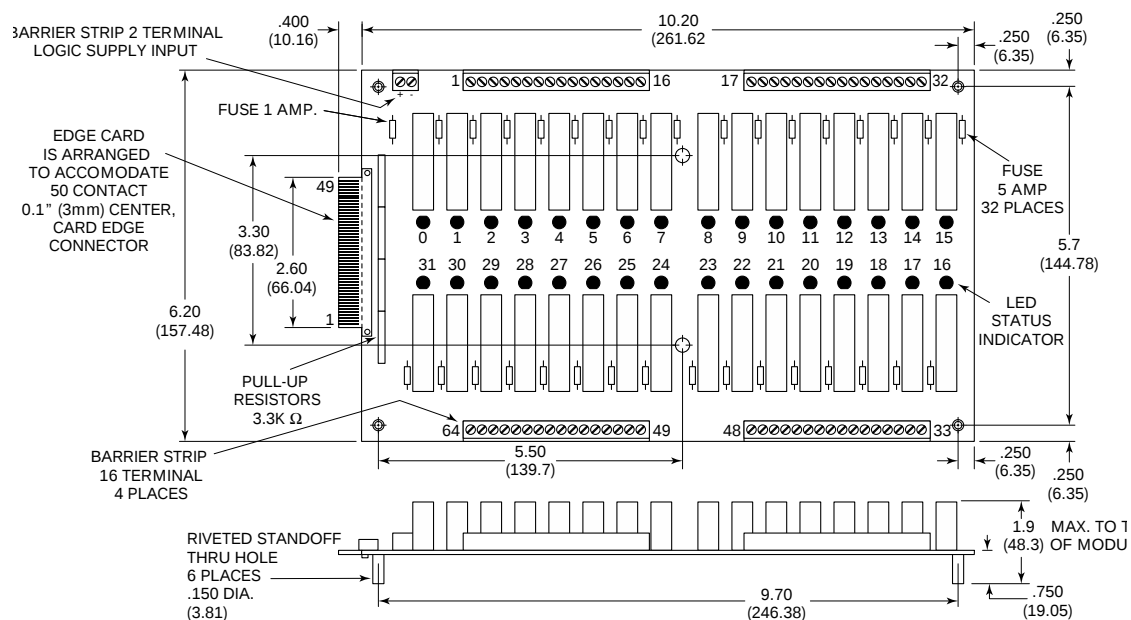
2IOM24 & 2IOM24D Outline Dimensions



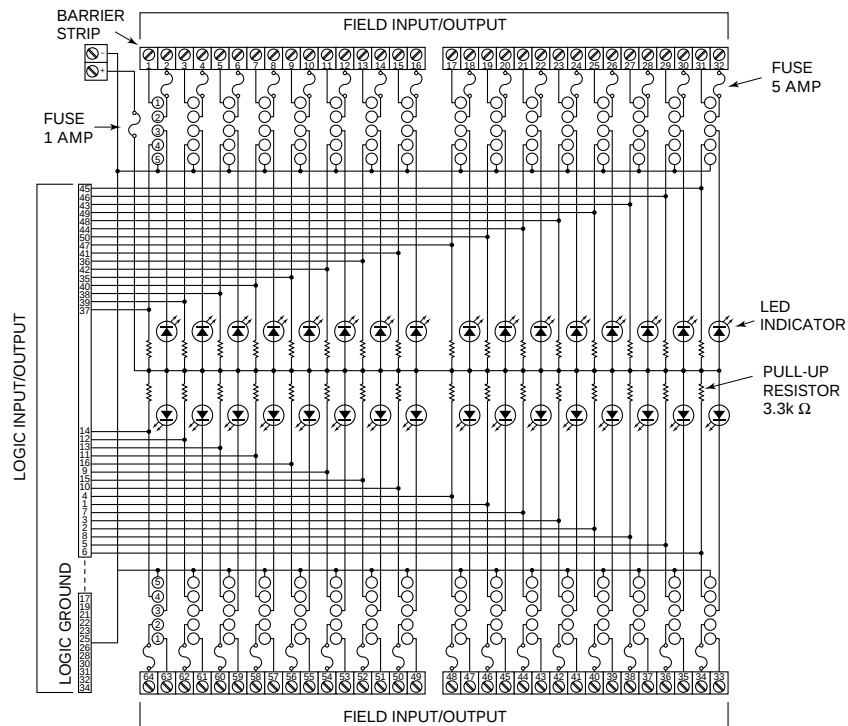
2IOM24 & 2IOM24D Schematic

Designed to operate with neg. true logic (active low) systems & one logic voltage.



2IOM32D Outline Dimensions**2IOM32D With Straight Header****2IOM32D Schematic**

Designed to operate with neg. true logic (active low) systems & one logic voltage.



Engineering Notes

A large rectangular area filled with a fine grid of squares, intended for drawing or writing engineering notes.