

# DPI SERIES | PUSH-IN DUAL CHANNEL

## PANEL MOUNT SOLID STATE RELAYS

Sensata | Crydom DPI Series is a family of hockey puck style, dual channel AC output Solid State Relays with easy to wire push-in connections, offering improved mechanical and thermal design compared to similar solutions in the market. These dual output SSRs are available with ratings of 20 and 40 Amps at 24 to 600 VAC.

DPI Series Dual SSRs have two outputs controlled by two independent DC control inputs, and the input connector is compatible with different types of header connectors (not included). This connector has a pitch of 5.08 mm, allowing for greater flexibility when wiring the input connections.



### Features

- Rating up to 40 Amps per channel <sup>(3)</sup>
- SCR Output for heavy industrial loads
- Output Push-in Connectors
- DBC substrate for superior thermal performance
- 4000 VAC Optical isolation <sup>(4)</sup>
- IP20 touch-safe housing
- Fast Push-in Wiring Connection without tools <sup>(5)</sup>
- cURus and TUV approved, CE and RoHS compliant

### Applications

- Industrial ovens
- Professional cooking equipment
- Heat trace controls
- Packaging equipment
- Plastic injection molding equipment
- Lighting control
- HVAC&R

## PRODUCT SELECTION

Control Voltage	20A	40A
4-32VDC	DPID2420	DPID2440
	DPID6020	DPID6040

## SPECIFICATIONS

### Output <sup>(1)</sup>

Description	DPID24XX	DPID60XX
Operating Voltage (47-63Hz) [Vrms] per UL508	24-280	48-600
Operating Voltage (47-63Hz) [Vrms] per EN 62314	280	480
Transient Overvoltage [Vpk]	600	1200
Minimum Off-State dV/dt @ Maximum Rated Voltage [V/μsec]	500	500
Maximum Off-State Leakage Current @ Rated Voltage [mArms]	1	1

## Output <sup>(1)</sup>

Description	20A	40A
Maximum Load Current per Channel LC A per EN 62314 @40°C [Arms] <sup>(2)</sup>	20	40 <sup>(3)</sup>
Overload Current Profile per EN 62314 [Ic/Ie]	1.5	1.5
Minimum Load Current [mArms]	150	150
Maximum 1 Cycle Surge Current (50/60Hz) [Apk]	286/300	716/750
Maximum On-State Voltage Drop @ Rated Current [Vrms]	1.25	1.3
Maximum 1/2 Cycle I <sup>2</sup> t for Fusing (50/60Hz) [A <sup>2</sup> sec]	409/375	2563/2343
Thermal Resistance Junction to Case (Rjc) [°C/W]	0.73	0.42
Wiring size for maximum ratings. [AWG](mm <sup>2</sup> ) /wires per terminal	12(4) /1	12(4)/2

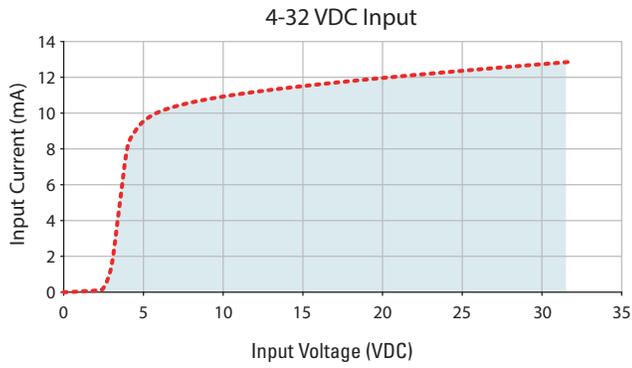
## Input <sup>(1)</sup>

Description	DPIDXXXX
Control Voltage Range [VDC]	4-32
Maximum Reverse Voltage [VDC]	-32
Minimum Turn-On Voltage [VDC]	4
Must Turn-Off Voltage [VDC]	1
Minimum Input Current per channel (for on-state) [mA]	7
Maximum Input Current per channel [mA]	15
Nominal Input Impedance [Ω]	Regulated Current
Maximum Turn-On Time	1/2 Cycle <sup>(6)</sup>
Maximum Turn-Off Time	1/2 Cycle

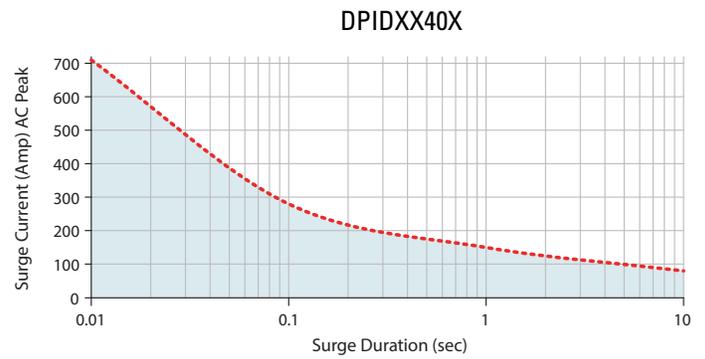
## General

Description	Parameters
Dielectric Strength, Input to Output (50/60Hz)	4000 Vrms
Dielectric Strength, Input/Output to Baseplate (50/60Hz)	2500 Vrms
Minimum Insulation Resistance (@ 500 VDC)	10 <sup>9</sup> Ohms
Maximum Capacitance, Input/Output	8 pF
Ambient Operating Temperature Range (7)	-40 to 80°C
Ambient Storage Temperature Range	-40 to 125 °C
Pollution Degree	2
Weight (typical)	2.84 oz / 80.51 g
Housing Material	UL94 V-0
Baseplate Material	Aluminum
Input Connector Type	5.08 mm Locking Header Pluggable Terminal block: 1836901 (Screw Connection Method), 1902136 (Spring Connection Method)
SSR Mounting Screw Torque Range	18-20 lb-in (2.0-2.2 Nm)

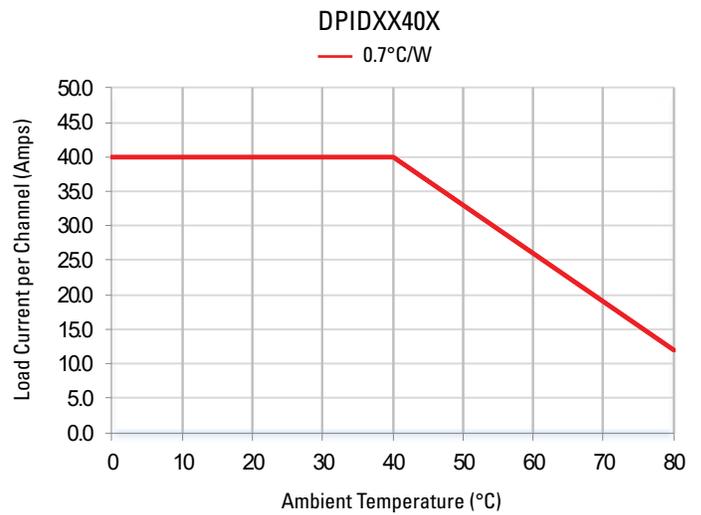
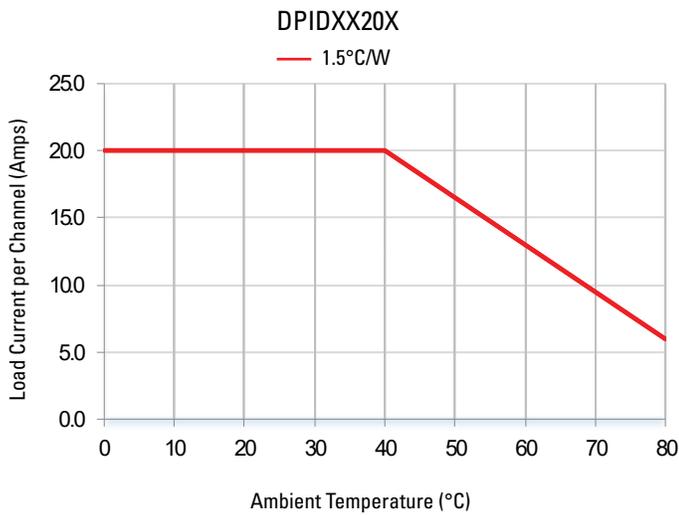
## INPUT CURRENT INFORMATION<sup>(1)</sup>



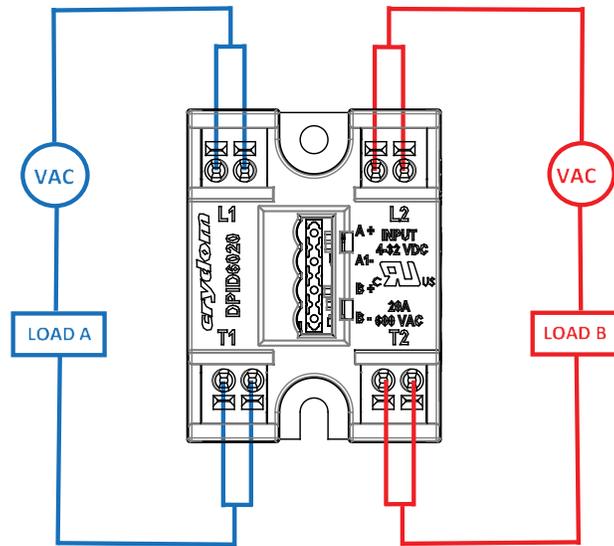
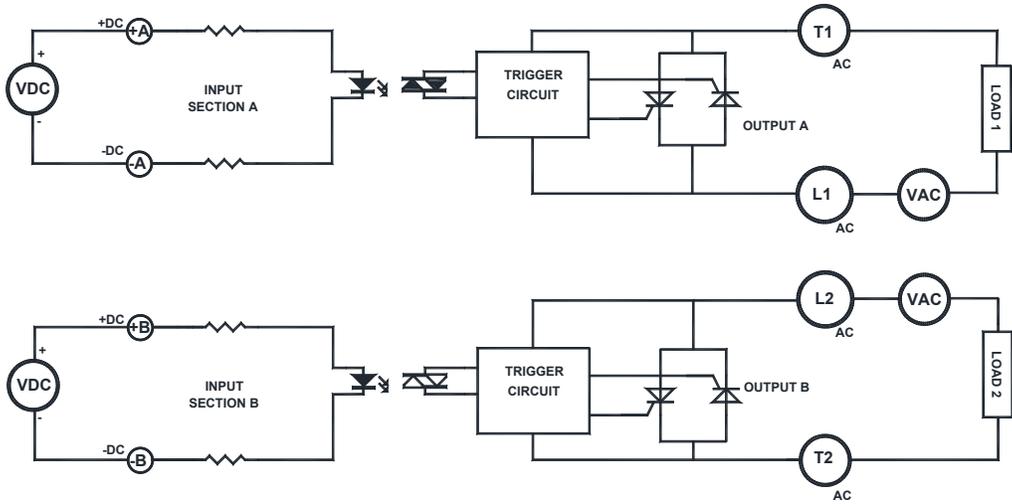
## SURGE CURRENT INFORMATION



## THERMAL DERATE INFORMATION<sup>(1)</sup>



**EQUIVALENT CIRCUIT BLOCK DIAGRAMS/WIRING DIAGRAMS<sup>(1)</sup>**



## ● INSTALLATION INSTRUCTIONS

### Mounting on Heat Sinks

Select adequate heat sink (see thermal derating curves in product series' datasheet).

Be sure to use a thermal pad or thermal compound (0.006 - 0.008 in layer thickness recommended) between the SSR and the selected heatsink (see Accessories section for options).

Before applying full torque tighten down both screws until they contact the baseplate. Then, tighten them to 15 to 20 lb-in / 1.7 to 2.2 Nm

For optimal thermal performance heat sink fins should be oriented vertically to promote natural convection airflow.

### Mounting on Panels

Locate the panel section on which the SSR will be mounted. Panel mount surface must provide adequate heat sinking capability, uncoated, clean, flat (0.004 in/in recommended) and preferably aluminum.

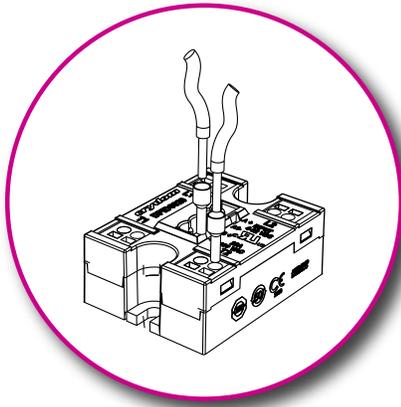
Be sure to use a thermal pad or thermal compound (0.006 - 0.008 in layer thickness recommended) between the SSR and the panel.

SSR mounting slots have a diameter of 0.2 in (5.0 mm). Two screws are needed (not included) to mount the SSR onto panel. Choose screw length considering the mounting surface hole depth and that the SSR baseplate thickness is 0.125 in (3.2 mm).

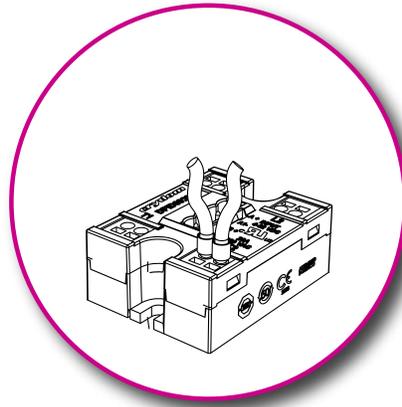
Before applying full torque tighten down both screws until they contact the baseplate. Then, tighten them to 20 lb-in (2.2 Nm).

### Installation of the insulated Ferrule

\*Use a recommended tool for crimping the ferrules before be installed into each connector, per Figure A.



*Ferrule terminal before crimping process*



*Two insulated ferrule installed*

## Recommended Cross Section for Output connection wire

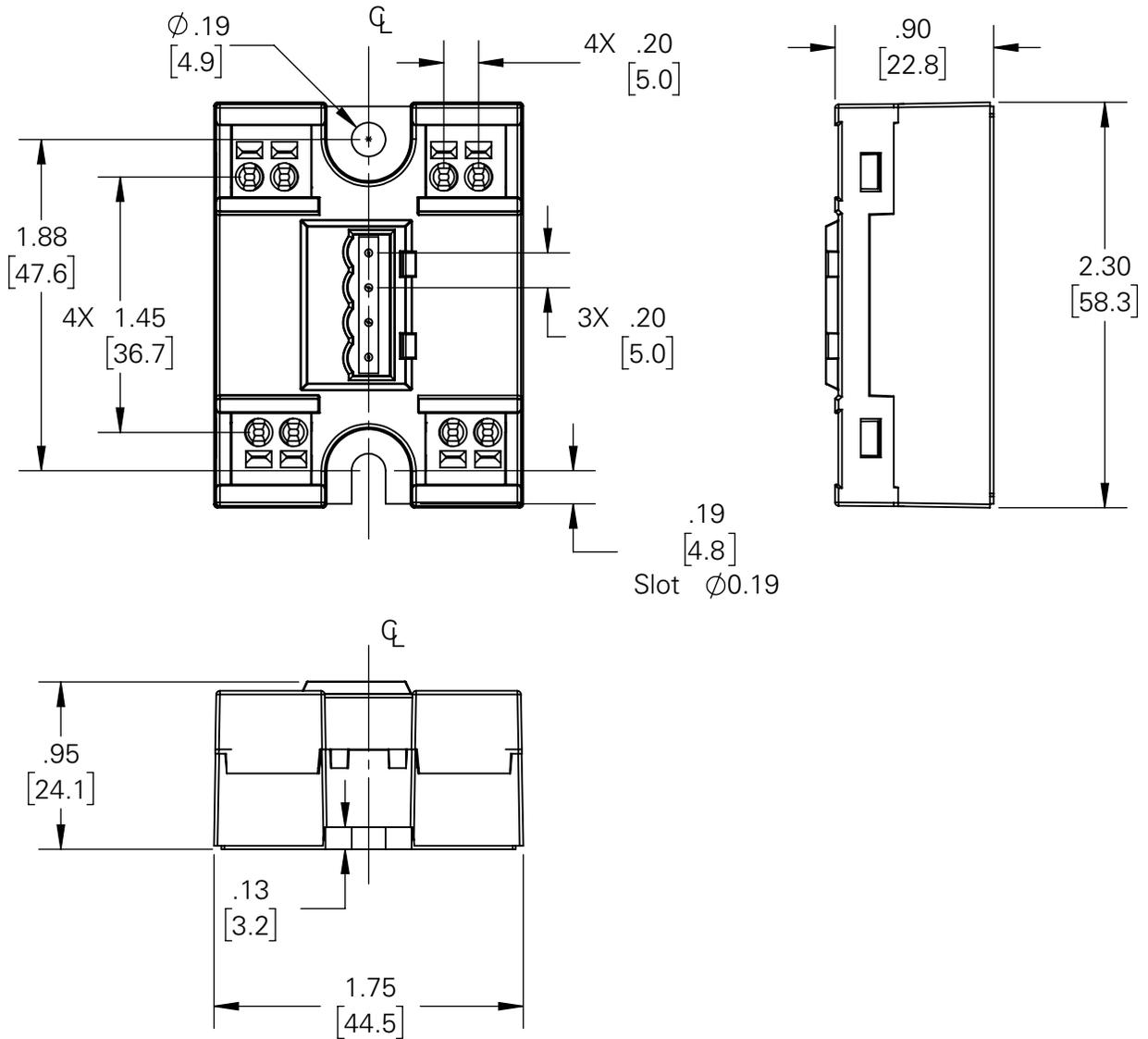
<b>Conductor cross section solid min.</b>	0.2 mm <sup>2</sup>
<b>Conductor cross section solid max.</b>	4 mm <sup>2</sup>
<b>Conductor cross section flexible min.</b>	0.2 mm <sup>2</sup>
<b>Conductor cross section flexible max.</b>	2.5 mm <sup>2</sup>
<b>Conductor cross section flexible, with ferrule without plastic sleeve min.</b>	0.25 mm <sup>2</sup> stripping length 8 mm
<b>Conductor cross section flexible, with ferrule without plastic sleeve max.</b>	0.25 mm <sup>2</sup> stripping length 8 mm
<b>Conductor cross section flexible, with ferrule with plastic sleeve min.</b>	0.25 mm <sup>2</sup> stripping length 8 mm
<b>Conductor cross section flexible, with ferrule with plastic sleeve max.</b>	0.25 mm <sup>2</sup> stripping length 8 mm
<b>Conductor cross section AWG min.</b>	24
<b>Conductor cross section AWG min.</b>	12

## Recommended Wire sizes

Wire size (Solid/stranded)	Wire pull-Out Strength (lb)[N]
Solid wire 14 AWG	25 [5.6]
Solid wire 12 AWG	

## MECHANICAL SPECIFICATIONS

Tolerances: +/- 0.02 in / 0.5mm  
 All dimensions are in: inches [millimeters]



## ORDERING OPTIONS

Example : DPID6040RH

<b>Series</b>	<b>DPI</b>	<b>D</b>	<b>60</b>	<b>40</b>	<b>R</b>	<b>H</b>
<b>DPI = Push-in Dual</b>						
<b>Control Voltage</b>						
<b>D = 4-32 VDC</b>						
<b>Operating Voltage</b>						
<b>24 = 24-280 VAC</b> <b>60 = 48-600 VAC</b>						
<b>Rated Load Current</b>						
<b>20 = 20Amps</b> <b>40 = 40Amps</b>						
<b>Switching Type</b>						
<b>Blank = Zero Voltage Turn-On</b> <b>R = Instantaneous Turn-On</b>						
<b>Thermal Pad</b>						
<b>Blank = Not included</b> <b>H = Included</b>						

## ACCESSORIES

Recommended Accessories			
 <b>Hardware Kit</b>	 <b>Heat Sink Part No.</b>	<b>Thermal Resistance [°C/W]</b>	 <b>Thermal Pad</b>

Example Compatible Mating Connectors			
Part Number	Manufacturer	Description	AWG
11121025	American Electrical	Crimp Wire Ferrule, Blue	Up to 12 AWG
1836901	Phoenix Contact	Terminal Block, Screw	30-12 AWG
1902136	Phoenix Contact	Terminal Block, Spring	24-12 AWG

## GENERAL NOTES

- (1) All parameters at 25°C, per channel, unless otherwise specified.
- (2) Heat sinking required, see derating curve.
- (3) For 40 Amps rating please use two conductors per connector push-in, each pole manages up to 20 Amps.
- (4) 4000 VAC between input vs output & 2500 VAC between terminals vs baseplate.
- (5) Stripping length of 8 mm nominal.
- (6) Turn-on time for Instantaneous turn-on versions is 0.1 msec.
- (7) Per EN 62314 @ 40°C.

## AGENCY APPROVALS & CERTIFICATIONS

Approvals (Tested and Certified According To)	
 cULus E116950	
UL 508 and C22.2 No.14	EN 62314

CONFORMANCE	ENVIRONMENTAL		
<b>Resistances to heat and fire</b>			
IEC 60335-1, Section 30	 Directive 2006/95/EC	 Directive 2011/65/EU	 GBT 26572-2011

Electromagnetic Compatibility				
Generic Standard	Immunity Tests	Test Specification Level		Performance
 IEC 61000-6-2 Immunity for Industrial Environments	Electrostatic Discharge	8kV air discharge		No degradation after tests
	IEC 61000-4-2	6kV contact discharge		
	Fast transients (burst)	Output 2kV, 5kHz, 100kHz	2kV, 5kHz, 100kHz	Criterion A
	IEC 61000-4-4	Input	1kV, 5kHz, 100kHz	
Surge IEC 61000-4-5	AC Input Option	Output	1kV Line to Line	Criterion B
			2kV Line to Earth	
			1kV Line to Line	
			2kV Line to Earth	

## WARNINGS



### RISK OF MATERIAL DAMAGE AND HOT ENCLOSURE

- The product's side panels may be hot, allow the product to cool before touching
- Follow proper mounting instructions including torque values
- Do not allow liquids or foreign objects to enter this product

**Failure to follow these instructions can result in serious injury, or equipment damage.**



### HAZARD OF ELECTRIC SHOCK, EXPLOSION OR ARC FLASH

- Disconnect all power before installing or working with this equipment
- Verify all connections and replace all covers before turning on power

**Failure to follow these instructions will result in death or serious injury.**

Datasheets provided by Sensata Technologies, Inc., its subsidiaries and/or affiliates ("Sensata") are solely intended to assist third parties ("Buyers") who are developing systems that incorporate Sensata products (also referred to herein as "components"). Buyer understands and agrees that Buyer remains responsible for using its independent analysis, valuation, and judgment in designing Buyer's systems and products. Sensata datasheets have been created using standard laboratory conditions and engineering practices. Sensata has not conducted any testing other than that specifically described in the published documentation for a particular datasheet. Sensata may make corrections, enhancements, improvements, and other changes to its datasheets or components without notice.

Buyers are authorized to use Sensata datasheets with the Sensata component(s) identified in each particular datasheet. HOWEVER, NO OTHER LICENSE, EXPRESS OR IMPLIED, BY ESTOPPEL OTHERWISE TO ANY OTHER SENSATA INTELLECTUAL PROPERTY RIGHT, AND NO LICENSE TO ANY THIRD PARTY TECHNOLOGY OR INTELLECTUAL PROPERTY RIGHT, IS GRANTED HEREIN. SENSATA DATASHEETS ARE PROVIDED "AS IS". SENSATA MAKES NO WARRANTIES OR REPRESENTATIONS WITH REGARD TO THE DATASHEETS OR USE OF THE DATASHEETS, EXPRESS, IMPLIED, OR STATUTORY, INCLUDING ACCURACY OR COMPLETENESS. SENSATA DISCLAIMS ANY WARRANTY OF TITLE AND ANY IMPLIED WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE, QUIET ENJOYMENT, QUIET POSSESSION, AND NON-INFRINGEMENT OF ANY THIRD PARTY INTELLECTUAL PROPERTY RIGHTS WITH REGARD TO SENSATA DATASHEETS OR USE THEREOF.

All products are sold subject to Sensata's terms and conditions of sale supplied at [www.sensata.com](http://www.sensata.com) SENSATA ASSUMES NO LIABILITY FOR APPLICATIONS ASSISTANCE OR THE DESIGN OF BUYERS' PRODUCTS. BUYER ACKNOWLEDGES AND AGREES THAT IT IS SOLELY RESPONSIBLE FOR COMPLIANCE WITH ALL LEGAL, REGULATORY, AND SAFETY-RELATED REQUIREMENTS CONCERNING ITS PRODUCTS, AND ANY USE OF SENSATA COMPONENTS IN ITS APPLICATIONS, NOTWITHSTANDING ANY APPLICATIONS-RELATED INFORMATION OR SUPPORT THAT MAY BE PROVIDED BY SENSATA.

Mailing Address: Sensata Technologies, Inc., 529 Pleasant Street, Attleboro, MA 02703, USA