

# DR SERIES

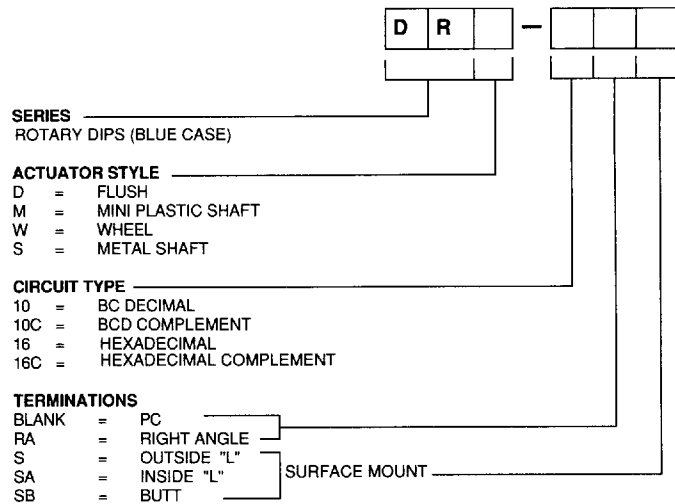
## Rotary Dip Switches

A-25-31

### DR SERIES FEATURES

- Available in PC and surface mount configurations.
  - High pressure contacts (140K PSI) provide 10,000 rotation life.
  - Unique design utilizes high pressure pin-point sliding contacts to penetrate contaminants on contact surface.
  - Gold contacts.
  - Terminals insert molded into base.
  - Screwdriver, knob and shaft (plastic and steel) type actuators available in both upright and right angle versions.
  - 10 and 16 position versions with both real and complement codes.
- Note: Common terminals connected internally.

### HOW TO ORDER



**EXAMPLE: DRW 10RA** = ROTARY DIP WITH WHEEL ACTUATOR BCD - 10 POSITION RIGHT ANGLE PC TERMINATIONS

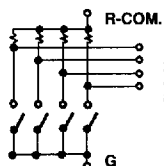
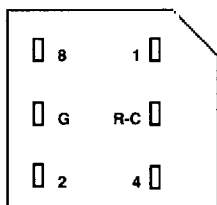
# RR SERIES

## Hybrid Rotary Dip Switches

### RR SERIES FEATURES

- All the features of the DR Series - PLUS
- Thick film resistors molded into the base of the switch.
  - Replaces discrete resistor network plus Rotary Dip Switch with one component.
  - Available with 3.3K OHMS and 10K OHMS resistors.
  - Custom resistor values available.
  - Ceramic substrate allows soldering temperature of 245°C for up to 30 seconds.

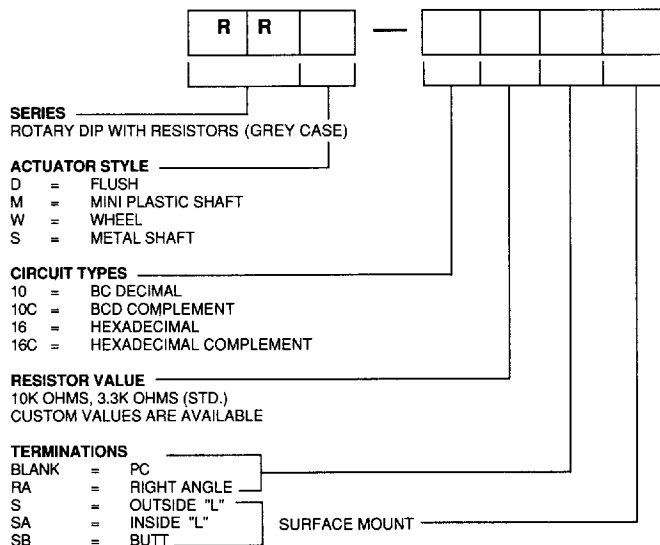
### RESISTOR NETWORK INFORMATION



SWITCH BOTTOM VIEW

RATED PWR.	RESISTANCE	TOLERANCE	MAX. VOLTAGE
125mW	3.3K Ohms	±5% at 85°C	24V
	10K Ohms		

### HOW TO ORDER



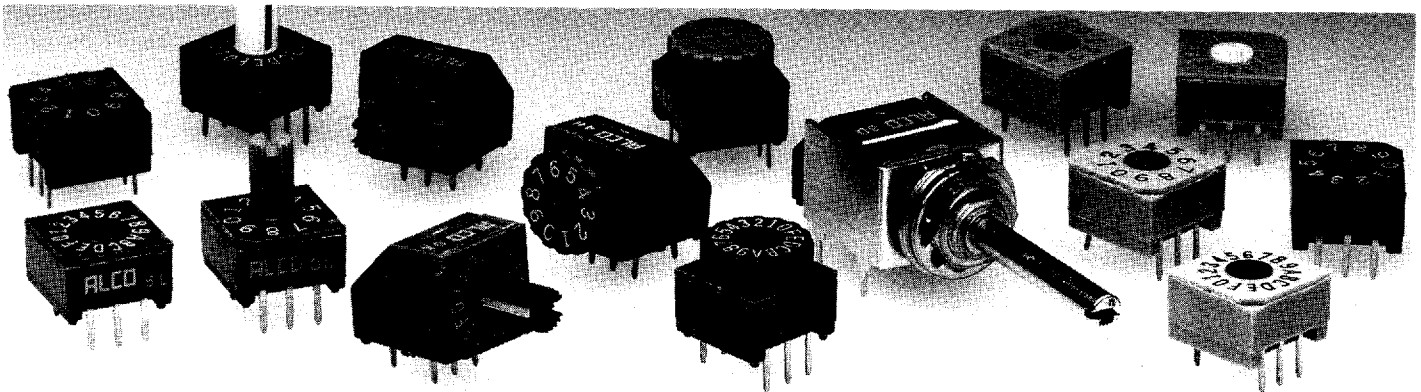
**EXAMPLE: RRM 10C 10K RA** = ROTARY DIP WITH RESISTORS WITH MINI PLASTIC SHAFT BCD COMPLEMENT 10K OHMS RESISTORS RIGHT ANGLE TERMINATIONS

SPECIFICATIONS SUBJECT TO CHANGE WITHOUT NOTICE.

# ROTARY DIP SWITCHES

A-25-31

DR Series/Rotary Dip Switch • RR Series/Rotary Dip Switch w/Integral Resistors  
RA/C Series/Rotary Dip Switch with Integral Diodes



## SPECIFICATIONS

### ELECTRICAL

Contact Rating .....0.4VA at 20VDC max.  
Initial Contact Resistance .....50 milliohms max. at 20VDC  
Insulation Resistance .....1,000 megohms min. at 100VDC  
Dielectric Strength .....300VAC RMS at sea level

### MECHANICAL

Operating Force .....6 oz.-in. nom.  
Surface Mount Operating Force .....3 oz.-in. nom.  
Life Expectancy .....10,000 Rotations  
Actuator Strength (DRM) .....5.0 lbs. max. lateral force

### MATERIALS

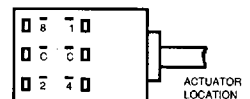
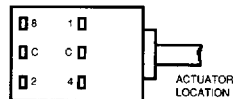
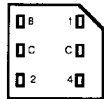
Base, Rotor and Case .....glass-filled PBT resin  
Contact/Terminals .....gold flashed brass  
Movable Contact .....gold flashed Beryllium copper  
Ball Support Plate .....phosphor bronze  
Detent Spring .....stainless steel (spring)  
Bushing (DRS) .....zinc die-casting  
Shaft (DRS) .....nickel plated brass

### ENVIRONMENTAL

Operating Temperature .....-30°C to +85°C  
Storage Temperature .....-45°C to +100°C  
Vibration Resistance .....subjected to vibration of 10-55hz per second with a total amplitude of .06 in. in 3 mutually perpendicular directions for 2 hours each.  
Shock Resistance .....will withstand 50G acceleration in 3 different planes for a period of 11 milliseconds  
Salt Spray Test .....withstands an atmosphere of 5% salt water at temperature of 50°C  
Hydrogen Sulfide Test .....withstands an atmosphere of 15-20 PPM hydrogen sulfide gas at temperature of 40°C for 240 hours  
Atmospheric Test .....withstands an atmosphere of 30-50 PPM sulfite gas at a temperature of 40°C for 240 hours  
Solder Heat Resistance .....withstands 5 sec. flow solder bath of 285°C when mounted on a .06" thick PC board  
Cleaning Test .....withstands ultrasonic cleaning in a 10% flux contaminated solvent solution

## TRUTH TABLES

Terminal Identification  
(view from bottom of the switch)



FOR HYBRID VERSIONS, COMMON BETWEEN TERMINALS 1 AND 4 IS RESISTOR OR DIODE COMMON.

### 10 - POSITION, BCD (red)

Pos.	0	1	2	3	4	5	6	7	8	9
C	X	X	X	X	X	X	X	X	X	X
1		X		X		X		X		X
2			X	X			X	X		
4					X	X	X	X		
8									X	X

### 16 - POSITION, HEXADECIMAL (black)

Pos.	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
C	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
1		X		X		X		X		X		X		X		X
2			X	X			X	X			X	X			X	X
4					X	X	X	X					X	X	X	X
8									X	X	X	X	X	X	X	X

### BCD COMPLEMENT (orange)

Pos.	0	1	2	3	4	5	6	7	8	9
C	X	X	X	X	X	X	X	X	X	X
1	X		X		X		X		X	
2	X	X			X	X			X	X
4	X	X	X	X					X	X
8	X	X	X	X	X	X	X	X		

### 16 - POSITION HEXADECIMAL (black)

Pos.	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
C	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
1	X		X		X		X		X		X		X		X	
2	X	X			X	X			X	X			X	X		
4	X	X	X	X					X	X	X	X				
8	X	X	X	X	X	X	X	X								

NOTE: COMMON TERMINALS ARE CONNECTED INTERNALLY, EXCEPT ON HYBRID VERSIONS.

SPECIFICATIONS SUBJECT TO CHANGE WITHOUT NOTICE.



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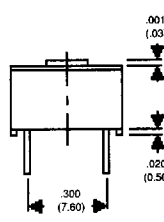
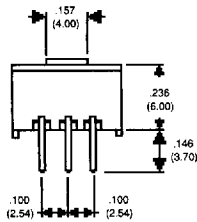
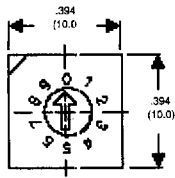
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# DR, RR & RA/C SERIES

## Rotary Dip Switches

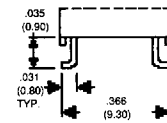
A-25-31

### "D" FLUSH ACTUATOR

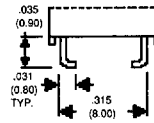


### SURFACE MOUNT TERMINATIONS

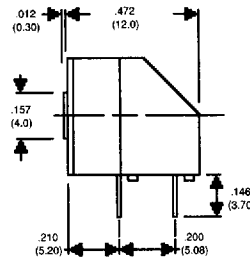
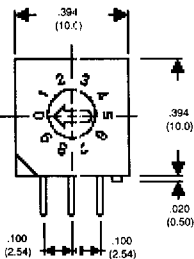
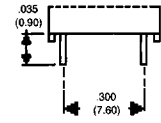
S



SA

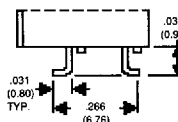


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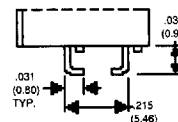


### SURFACE MOUNT TERMINATIONS

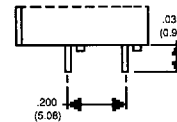
RAS



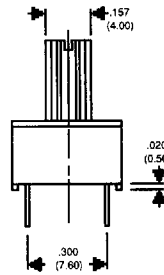
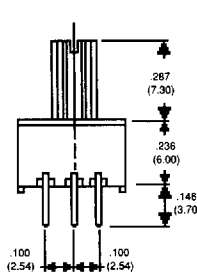
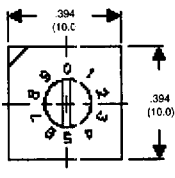
RASA



RASB

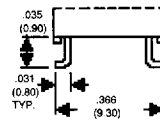


### "M" MINI-SHAFT ACTUATOR

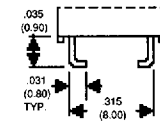


### SURFACE MOUNT TERMINATIONS

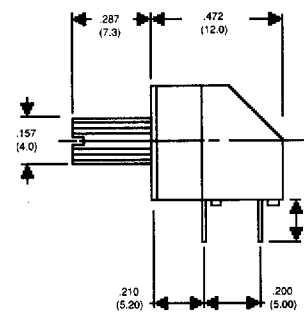
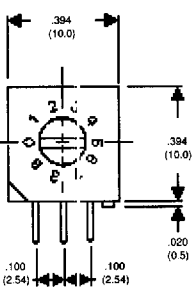
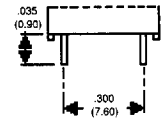
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SA

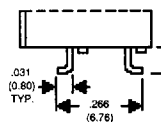


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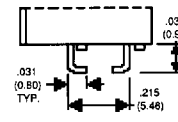


### SURFACE MOUNT TERMINATIONS

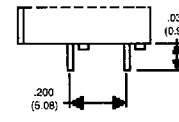
RAS



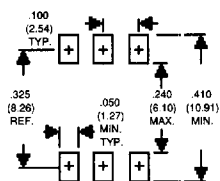
RASA



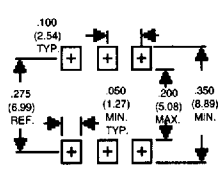
RASB



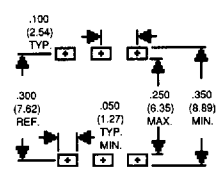
### PAD LAYOUTS



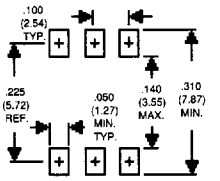
S  
OUTSIDE 'L'



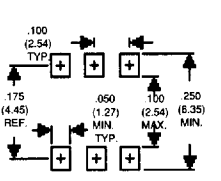
SA  
INSIDE 'L'



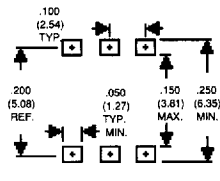
SB  
BUTT



RAS  
OUTSIDE 'L'



RASA  
INSIDE 'L'



RASB  
BUTT

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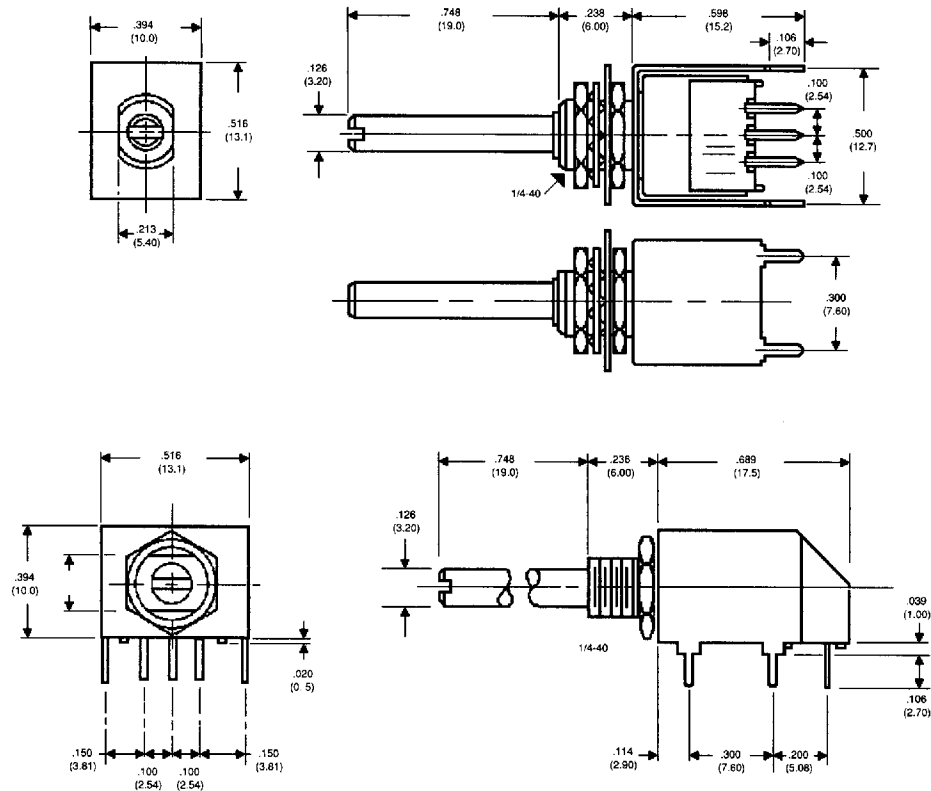
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# DR, RR & RA/C SERIES

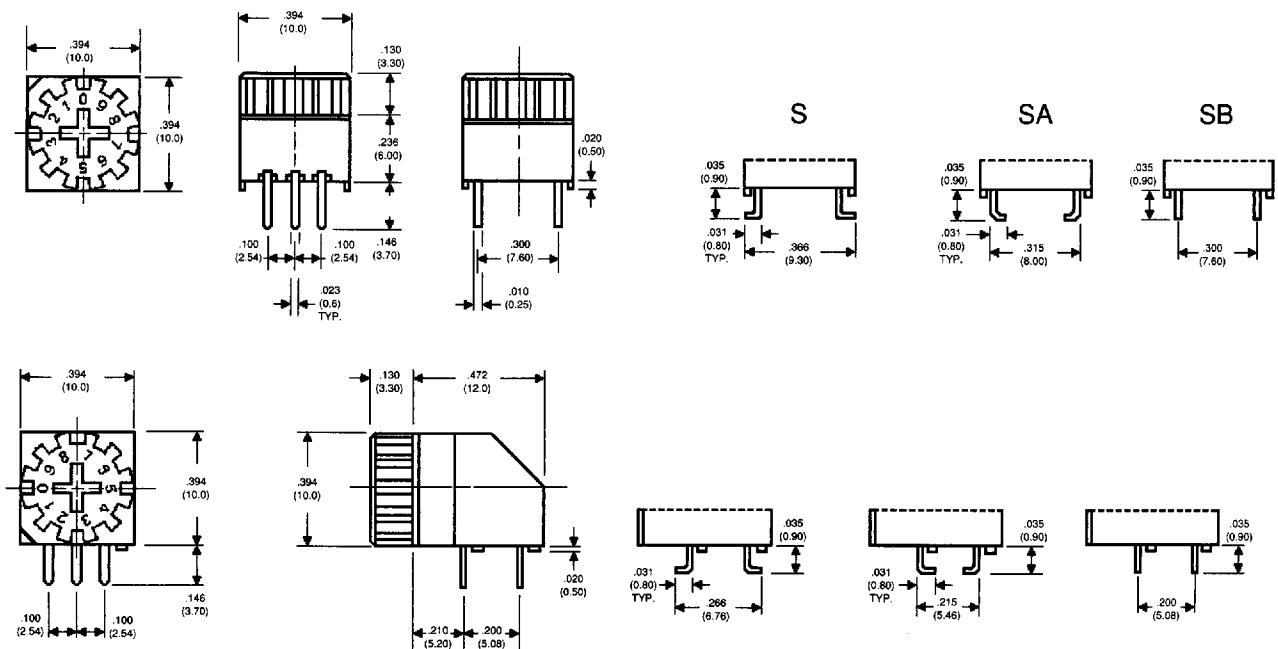
## Rotary Dip Switches

A-25-31

### "S" METAL SHAFT ACTUATOR



### "W" WHEEL ACTUATOR



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# SOLDERING PROCESS RECOMMENDATION GUIDE

AUGAT/ INTCON PRDT GP

49E D ■ 1095335 0001533 628 ■ AUIP ○

The majority of customers utilizing miniature or sub miniature switches in the industry today have a great concern about the switches capabilities during their soldering and cleaning cycles. This concern centers around the introduction of contaminants into the switch contact area which could cause the switch to experience various failure modes either immediately or during the life cycle of the switches usage. These failure modes can show in a number of manners. The following are just a few examples: high contact resistance, open contacts, low dielectric strength breakdown, and high actuation forces causing use related applications to malfunction. Since most fluxes become active with the introduction of the high temperatures used in all soldering techniques, the switch must either prevent these fluxes from entering into its contact area or allow cleaning techniques to carry flux particles out. It must be understood that switch contamination can occur during any procedure: from hand soldering to the new age Surface Mount systems using vapor phase, I.R., or Convection chambers for solder reflow.

We at Augat/Alcoswitch offer a wide range of switches to handle any soldering operations. However, certain soldering conditions will not apply to all switches. The following conditions and charts should help assist you in the soldering of our switches in your application. If you need additional information, feel free to contact the factory.

## SOLDERING TYPES

### A. Wave Soldering:

Top & Bottom board preheats: 200°F(93°C) for approximately 3 to 4 minutes.  
Solder Temperature and Dwell Time: 500°F(260°C) for approximately 3 to 5 seconds.

### B. Hand Soldering

1. 500°F-600°F(260°C-316°C)utilizing a controlled 40 Watt iron for 3 to 5 seconds maximum.
2. 500°F(260°C) utilizing a controlled 30 Watt iron for 10 seconds maximum.

### C. Dip Soldering

Solder Temperature & Dwell Time: 500°F(260°C) for 10 seconds maximum.

### D.Surface Mount

1. Convection IR  
Zone 1 = 212°F(100°C) for 120 seconds maximum.  
Zone 2 = 419°F(215°C) is reaches in approximately 160 seconds after zone 1, and held at that temperature for approximately 10 seconds.
2. Radiant IR  
Zones 1 & 2 combined = 330°F(166°C) maximum with a total run of 210°C(99°C) seconds.  
Zone 3 & 4 combined = 460°F(238°C) is reached in approximately 30 seconds after zones 1 & 2 and held at that temperature for approximately 10 seconds.
3. Vapor Phase  
Zone 1 = 140°F (60°C) for 15 seconds.  
Zone 2 = 419°F(215°C) for 30 seconds.

## CLEANING TYPES

- A. Solvent Wash (1.1.1 Trichlorethylene, T.M.S., T.M.C.)
- B. Vapor Degreasing
- C. Solvent Immersion
- D. Aqueous Cleaning

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**SOLDERING PROCESS RECOMMENDATION GUIDE**

SWITCH SERIES	SOLDERING TYPE			SURFACE MOUNT PROCESS			CLEANING PROCESSES			
	Wave	Hand	Dip*	Convection I.R.	Radiant I.R.	Vapor Phase	Solvent Wash	Vapor Degrease	Solvent Immerse	Aqueous Clean
<b>ALCO</b> ®										
AP, AT, AS SERIES	X	X	X				X			X
ALE,ATLE,ATE,APBE	X	X	X				X	X	X	X
ASE & F	X	X	X	X	X	X	X	X	X	X
COMMAND SERIES, PC	X	X								
COMMAND SERIES, LUGS		X								
CST/CSS SERIES	X	X	X				X	X	X	X
DIP ROT.: DR,RR &RA/C	X	X	X				X	X	X	X
DIP ROT.: DRS SERIES	X	X	X				X	X		X
DIPS:AD,AR,AA/C,ATT	X	X	X	X		X	X	X	X	X
DIPS:DP SERIES W/O TAPE		X	X				X			
DIPS:DP SERIES W/TAPE	X	X	X				X	X	X	X
DIPS:DTS WITH TAPE	X	X	X				X	X	X	X
DIPS:DTS,DYS W/O TAPE		X	X				X			
DIPS:S SERIES SIPS	X	X	X	X		X	X	X	X	X
DIPS:DPT WITH TAPE	X	X	X				X	X	X	X
DIPS:DPU WITHOUT TAPE		X	X							
DIPS:DSS101	X	X	X							
FSB1, FSB2		X	X							
FSM SERIES		X								
FT2D,FT1D	X	X	X				X	X	X	X
GEMINI: A SERIES	X	X	X				X			
GEMINI: AE SERIES	X	X	X				X	X	X	X
GREEN SERIES: ALL MT VERSIONS		X	X				X	X		
GREEN SERIES: ALL MT VERSIONS PC	X	X	X				X			
GREEN SERIES: MHV,MRV,MLD		X	X				X	X		
GREEN SERIES: MPA-6,MPG,MPN,MPE		X	X				X	X		
GREEN SERIES: MTE		X	X				X	X		
LVP/LHP SERIES	X	X	X							
MAS SERIES		X	X					X	X	
MHS SERIES	X	X	X				X	X	X	X
MKS SERIES	X	X	X				X	X	X	
MLP SERIES		X	X				X			
MM-9 SERIES		X	X							
MMS SERIES		X	X				X	X		
MPA-3 SERIES		X	X				X	X		
MPA-6 SERIES		X	X				X			
MPB SERIES		X	X				X	X		
MPN SERIES		X	X				X			
MPS SERIES		X	X				X	X		
MRBA SERIES		X	X				X	X		
MRC SERIES		X	X				X	X		
MRJ SERIES	X	X	X				X			
MRJE/MRJB SERIES	X	X	X				X	X	X	X
MRS SERIES	X	X	X				X	X		X

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**SOLDERING PROCESS RECOMMENDATION GUIDE**

SWITCH SERIES	SOLDERING TYPE			SURFACE MOUNT PROCESS			CLEANING PROCESSES			
	Wave	Hand	Dip*	Convection I.R.	Radiant I.R.	Vapor Phase	Solvent Wash	Vapor Degrease	Solvent Immerse	Aqueous Clean
MRS-RA SERIES	X	X	X				X	X		
MRSB SERIES	X	X	X				X	X	X	X
MRSK SERIES		X	X				X	X		
MSP-3 /MSPS SERIES		X	X							
MSP-5 SERIES		X	X				X	X		
MSPF SERIES		X	X				X	X		
MSPM SERIES		X	X				X	X		
MSS SERIES	X	X	X				X	X	X	X
MSSA SERIES	X	X	X				X	X	X	X
MSSA-01 & 04	X	X	X				X	X	X	X
PBL SERIES	X									X
PUSHWHEELS, CARD EDGE		X								
PUSHWHEELS, PC PINS	X	X	X							
QAS SERIES		X	X				X			
SC CIRCUIT BREAKERS	X	X								
SDS SERIES	X	X	X				X	X	X	X
SE SERIES	X	X	X				X	X	X	X
SKC SERIES		X								
SKF SERIES		X								
SKFC1		X	X				X	X		
SKFC2L		X								
SKT SERIES		X	X				X	X		
SL SERIES	X	X	X				X	X	X	
SLS/SLSA SERIES	X	X	X				X	X	X	
SMT/SMP:PC,PCV,RA,VRA	X	X	X				X	X	X	X
SMT/SMP:SPC,SRA,SRAB				X	X	X	X	X	X	X
SSA/SSJ SERIES	X	X	X				X	X		
SSB SERIES	X	X	X				X	X	X	X
SSM SERIES	X	X	X				X	X	X	X
STS SERIES	X	X	X				X	X	X	X
SWK SERIES		X								
TP SERIES: ALL PC/BLUE CASES	X									
TP SERIES:TP-ES	X	X	X				X	X	X	X
TP SERIES:W/TACT. FEEL & PROC. SEAL	X	X	X				X	X	X	X
TP SERIES:TPC,TPD,TPF,TP-N		X	X				X	X		
TP200 SERIES:TP1M,TP1L,TP2M,TP2L		X	X				X	X		
TR SERIES	X	X	X				X			
TRD	X	X	X				X			
TRD W/L.E.D.		X	X							
TS SERIES	X	X	X				X	X	X	X
TSS-PC, TSS-RA	X	X					X			
TT ALL PC/BLUE CASES	X	X					X			
TT,TTE-ES,TT-RA	X	X	X				X	X	X	X
TT,TTETT,TTE,TTN-WIRE LUG		X	X				X			
XR110, XR210, XRM		X								

SPECIFICATIONS SUBJECT TO CHANGE WITHOUT NOTICE.

**AUGAT**

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