

## IM Relay

- Slim line 10x6mm, low profile 5.65mm and min. board-space 60mm<sup>2</sup>
- Switching current 2/5A, switching power 60W/62.5VA and switching voltage 220VDC/250VAC
- Low coil power consumption, 140mW standard, 100mW for high sensitive version, 50mW for ultra high sensitive version and 100mW for bistable version
- High dielectric and surge capability up to 2500Vrms between open contacts and 2500Vrms between coil and contacts
- High mechanical shock resistance up to 50g functional

### Typical applications

Telecommunication, access and transmission equipment, optical network terminals, modems, office and business equipment, consumer electronics, measurement and test equipment, industrial control, medical equipment, HVAC

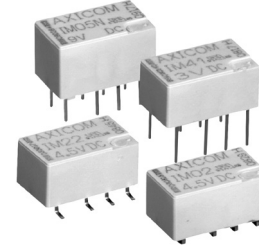
### Approvals

UL 508 File No. E 111441

Technical data of approved types on request

| Contact Data                | standard, C                          | D, I                 | P                              |
|-----------------------------|--------------------------------------|----------------------|--------------------------------|
|                             | standard and high dielectric version | high current version | high contact stability version |
| Contact arrangement         | 2 form C, 2 CO                       |                      |                                |
| Max. switching voltage      | 220VDC, 250VAC                       | 220VDC, 250VAC       | 220VDC, 250VAC                 |
| Rated current               | 2A                                   | 5A                   | 2A                             |
| Limiting continuous current | 2A                                   | 5A                   | 2A                             |
| Switching power             | 60W, 62.5VA                          |                      |                                |
| Contact material            | PdRu +Au                             | AgNi +Au             | PdRu +Au                       |
| Contact style               | covered twin cont.                   | covered twin cont.   | covered twin cont.             |
|                             | I: single contacts                   |                      |                                |
| Minimum switching voltage   | 100µV                                |                      |                                |
| Initial contact resistance  | <50mΩ at 10mA/30mV<br>I: < 100mΩ     |                      |                                |
| Thermoelectric potential    | <10µV                                |                      |                                |
| Operate time                | typ. 1ms, max. 3ms                   |                      |                                |
| Release time                | typ. 1ms, max. 3ms                   |                      |                                |
| without diode in parallel   | typ. 3ms, max. 5ms                   |                      |                                |
| with diode in parallel      | typ. 1ms, max. 5ms                   |                      |                                |
| Bounce time max.            | typ. 1ms, max. 5ms                   |                      |                                |

### Max. DC load breaking capacity



### Contact Data (continued)

Electrical endurance

at contact application 0  
(≤30mV/≤10mA)

cable load open end

resistive, 125VDC / 0.24A - 30W

resistive, 220 VDC / 0.27A - 60W

resistive, 250VAC / 0.25A - 62.5VA

resistive, 30VDC / 1A - 30W

resistive, 30VDC / 2A - 60W

min. 2.5x10<sup>6</sup> operations

min. 2.0x10<sup>6</sup> operations

min. 5x10<sup>5</sup> operations

min. 1x10<sup>5</sup> operations

min. 1x10<sup>5</sup> operations

min. 5x10<sup>5</sup> operations

min. 1x10<sup>5</sup> operations

UL contact rating

30VDC, 2A, 60W, NO only

110VDC, 0.3A, 33W

220VDC, 0.27A, 60W

125VAC, 0.5A, 62.5W

250VAC, 0.25A, 62.5W

Mechanical endurance

10<sup>8</sup> operations

### Coil Data

Magnetic system

monostable, bistable

Coil voltage range

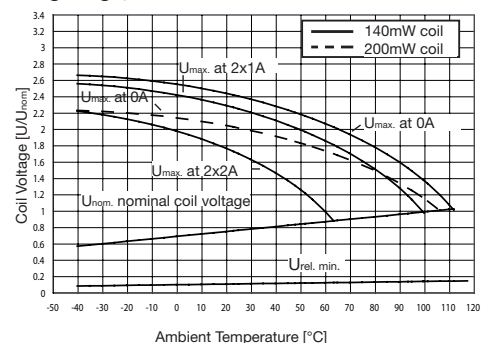
1.5 to 24VDC

### Coil versions, standard version, monostable, 1 coil

| Coil code | Rated voltage VDC | Operate voltage VDC | Release voltage VDC | Coil resistance Ω±10% | Rated coil power mW |
|-----------|-------------------|---------------------|---------------------|-----------------------|---------------------|
| 00        | 1.5               | 1.13                | 0.15                | 16                    | 140                 |
| 08        | 2.4               | 1.80                | 0.24                | 41                    | 140                 |
| 01        | 3                 | 2.25                | 0.30                | 64                    | 140                 |
| 02        | 4.5               | 3.38                | 0.45                | 145                   | 140                 |
| 03        | 5                 | 3.75                | 0.50                | 178                   | 140                 |
| 04        | 6                 | 4.50                | 0.60                | 257                   | 140                 |
| 05        | 9                 | 6.75                | 0.90                | 579                   | 140                 |
| 06        | 12                | 9.00                | 1.20                | 1029                  | 140                 |
| 07        | 24                | 18.00               | 2.40                | 2880                  | 200                 |

All figures are given for coil without pre-energization, at ambient temperature +23°C

### Coil operating range, standard version



IM Relay (Continued)

Coil Data (continued)

Coil versions, sensitive version, monostable, 1 coil

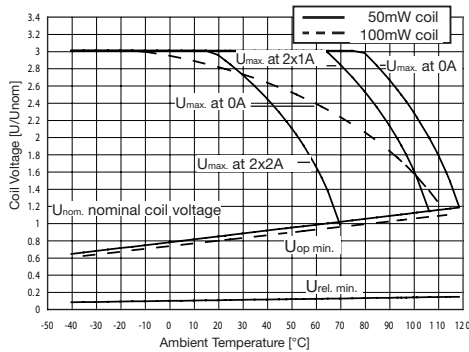
| Coil code | Rated voltage VDC | Operate voltage VDC | Release voltage VDC | Coil resistance $\Omega \pm 10\%$ | Rated coil power mW |
|-----------|-------------------|---------------------|---------------------|-----------------------------------|---------------------|
| 11        | 3                 | 2.40                | 0.30                | 91                                | 100                 |
| 12        | 4.5               | 3.60                | 0.45                | 194                               | 100                 |
| 13        | 5                 | 4.00                | 0.50                | 234                               | 100                 |
| 16        | 12                | 9.60                | 1.20                | 1315                              | 110                 |
| 17        | 24                | 19.20               | 2.40                | 4120                              | 140                 |

Coil versions, ultra high sensitive version, monostable, 1 coil

| Coil code | Rated voltage VDC | Operate voltage VDC | Release voltage VDC | Coil resistance $\Omega \pm 10\%$ | Rated coil power mW |
|-----------|-------------------|---------------------|---------------------|-----------------------------------|---------------------|
| 21        | 3                 | 3.00                | 0.30                | 180                               | 50                  |
| 22        | 4.5               | 4.50                | 0.45                | 405                               | 50                  |
| 23        | 5                 | 5.00                | 0.50                | 500                               | 50                  |
| 26        | 12                | 12.00               | 1.20                | 2880                              | 50                  |

All figures are given for coil without pre-energization, at ambient temperature +23°C

Coil operating range, sensitive and ultra high sensitive coil

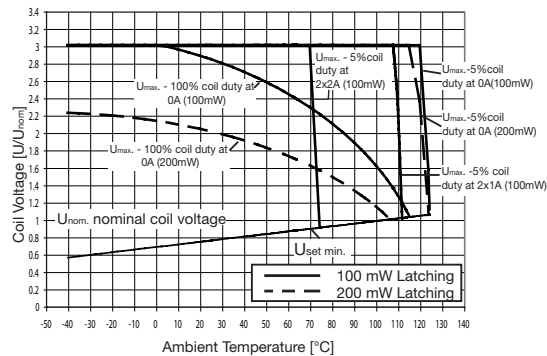


Coil versions, standard, bistable 1 coil

| Coil code | Rated voltage VDC | Set voltage VDC | Reset voltage VDC | Coil resistance $\Omega \pm 10\%$ | Rated coil power mW |
|-----------|-------------------|-----------------|-------------------|-----------------------------------|---------------------|
| 40        | 1.5               | 1.13            | -1.13             | 23                                | 100                 |
| 48        | 2.4               | 1.80            | -1.80             | 58                                | 100                 |
| 41        | 3                 | 2.25            | -2.25             | 90                                | 100                 |
| 42        | 4.5               | 3.38            | -3.38             | 203                               | 100                 |
| 43        | 5                 | 3.75            | -3.75             | 250                               | 100                 |
| 44        | 6                 | 4.50            | -4.50             | 360                               | 100                 |
| 45        | 9                 | 6.75            | -6.75             | 810                               | 100                 |
| 46        | 12                | 9.00            | -9.00             | 1440                              | 100                 |
| 47        | 24                | 18.00           | -18.00            | 2880                              | 200                 |

All figures are given for coil without pre-energization, at ambient temperature +23°C

Coil operating range, bistable 1 coil



Insulation Data

|                                 | standard*                                         | C*                      | D,P, I                                       |
|---------------------------------|---------------------------------------------------|-------------------------|----------------------------------------------|
|                                 | standard, sensitive, ultra high sensitive version | high dielectric version | high current, high contact stability version |
| Initial dielectric strength     |                                                   |                         |                                              |
| between open contacts           | 1000V <sub>rms</sub>                              | 1500V <sub>rms</sub>    | 750V <sub>rms</sub>                          |
| between contact and coil        | 1800V <sub>rms</sub>                              | 1800V <sub>rms</sub>    | 1500V <sub>rms</sub>                         |
| between adjacent contacts       | 1000V <sub>rms</sub>                              | 1800V <sub>rms</sub>    | 750V <sub>rms</sub>                          |
| Initial surge withstand voltage |                                                   |                         |                                              |
| between open contacts           | 1500V                                             | 2500V                   | 1000V                                        |
| between contact and coil        | 2500V                                             | 2500V                   | 2000V                                        |
| between adjacent contacts       | 1500V                                             | 2500V                   | 1000V                                        |
| Initial insulation resistance   |                                                   |                         |                                              |
| between insulated elements      | >10 <sup>9</sup> Ω                                | >10 <sup>9</sup> Ω      | >10 <sup>9</sup> Ω                           |
| Capacitance                     |                                                   |                         |                                              |
| between open contacts           |                                                   | max. 1pF                |                                              |
| between contact and coil        |                                                   | max. 2pF                |                                              |
| between adjacent contacts       |                                                   | max. 2pF                |                                              |

\*this relay contains SF6 (Sulfur hexafluoride, CAS number: 2551-62-4) for dielectric strength enhancement, SF6 is hermetically sealed in relay without leaks to air during normal application as recommended per the applicable product specification. It is clarified that the usage of SF6 in mini signal relay is not prohibited by related regulations. Please contact TE local sales or field engineer for further information and detailed material declaration.

RF Data

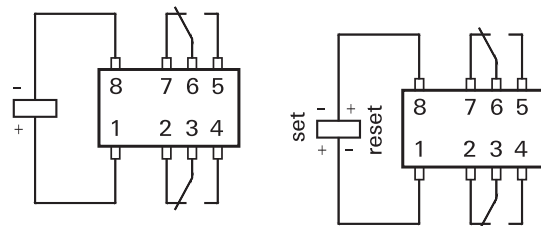
|                                                     |               |
|-----------------------------------------------------|---------------|
| Isolation at 100MHz/900MHz                          | 37.0dB/18.8dB |
| Insertion loss at 100MHz/900MHz                     | 0.03dB/0.33dB |
| Voltage standing wave ratio (VSWR) at 100MHz/900MHz | 1.06/1.49     |

Other Data

Material compliance: EU RoHS/ELV, China RoHS, REACH, Halogen content refer to the Product Compliance Support Center at [www.te.com/customer-support/rohssupportcenter](http://www.te.com/customer-support/rohssupportcenter)

|                                                  |                            |
|--------------------------------------------------|----------------------------|
| Ambient temperature                              | -40°C to +85°C             |
| Thermal resistance                               | <150K/W                    |
| Category of environmental protection             | IEC 61810                  |
|                                                  | RT V - hermetically sealed |
| Vibration resistance (functional)                | 20g, 10 to 500Hz           |
| Shock resistance (functional), half sinus 11ms   | 50g                        |
| Shock resistance (destructive), half sinus 0.5ms | 500g                       |
| Mounting position                                | any                        |
| Weight                                           | max. 0.75g                 |
| Resistance to soldering heat SMT                 | IEC 60068-2-58             |
| Moisture sensitive level, JEDEC J-Std-020D       | MSL3                       |
| related only to SMT relays                       |                            |
| packed in original dry-packs                     |                            |

|                     |                                       |
|---------------------|---------------------------------------|
| Ultrasonic cleaning | not recommended                       |
| Packaging/unit      |                                       |
| THT version         | tube/50pcs., box/1000 pcs.            |
| SMT version         | reel/1000 pcs., box/1000 or 5000 pcs. |
| Monostable version  | Bistable version, 1 coil              |
| rest condition      | reset condition                       |

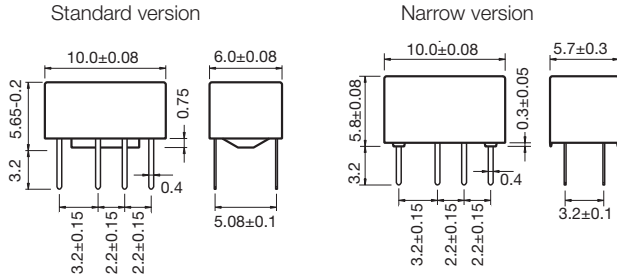


Contacts are shown in reset condition. Contact position might change during transportation and must be reset before use.

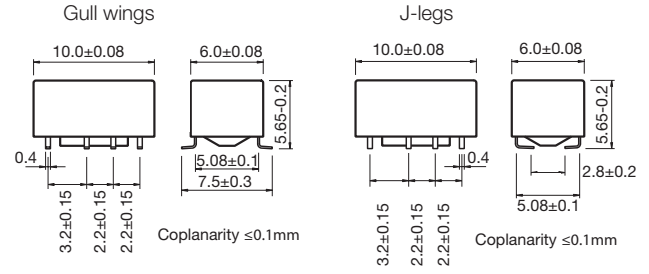
## IM Relay (Continued)

### Dimensions

#### THT version

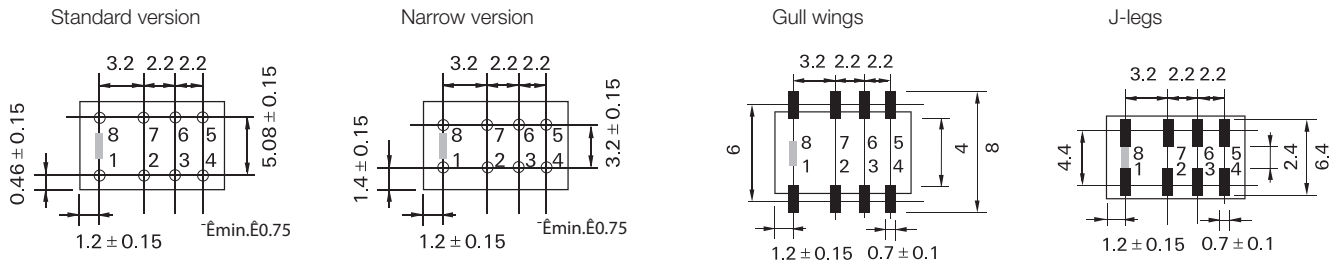


#### SMT version



### PCB layout

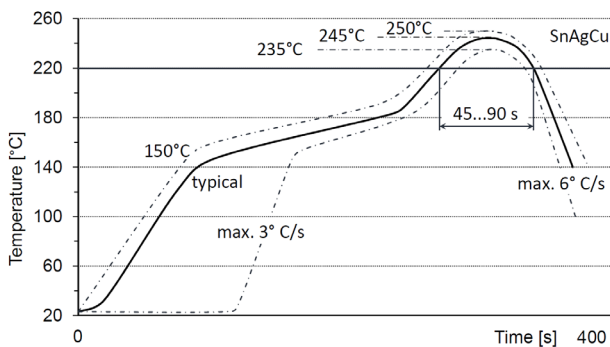
TOP view on component side of PCB



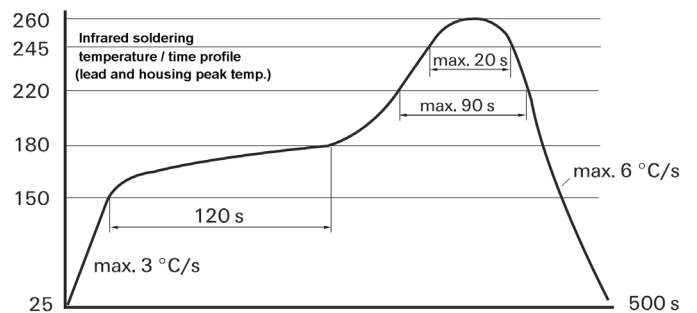
### Processing

Recommended soldering conditions

#### Recommended reflow soldering profile IEC 61760-1



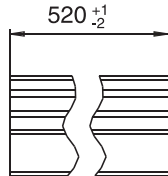
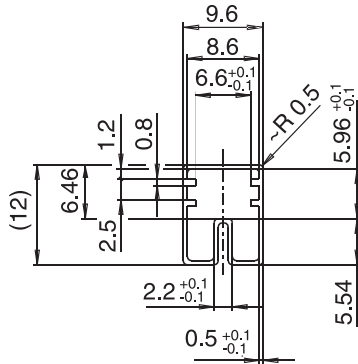
#### Resistance to soldering heat - reflow profile IEC 60068-2-58



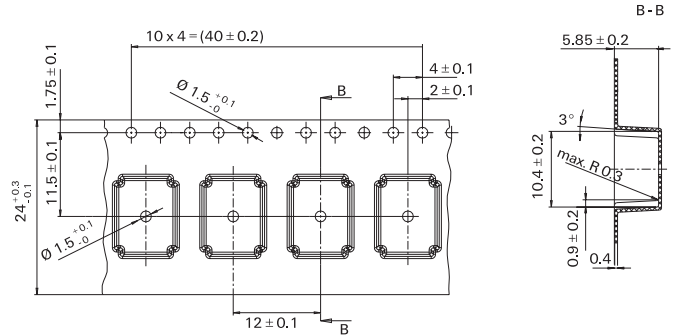
IM Relay (Continued)

Packing

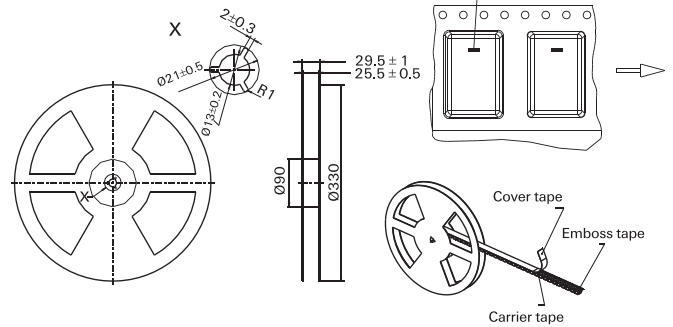
Tube for THT version  
50 relays per tube, 1000 relays per box



Tape and reel for SMT version  
1000 relays per reel, 1000 or 5000 relays per box



Reel dimensions



Product code structure

Typical product code

IM

03

G

R

Type

IM Signal Relays IM Series

Contact arrangement

Blank 2 form C, 2 CO

Coil

Coil code: please refer to coil versions table

Performance type

Blank Standard version

I High current version single contact  
C High dielectric version  
D High current version  
P High contact stability version

Terminals

T THT - standard  
N THT - narrow version

J SMT - J-leg  
G SMT - gull wing

Packing

S Tube

R Reel

## IM Relay (Continued)

| Product code | Arrangement                   | Perf. type | Coil   | Coil type  | Coil                 | Terminals     | Part number |
|--------------|-------------------------------|------------|--------|------------|----------------------|---------------|-------------|
| IM00GR       | 2 form C,<br>2 CO<br>contacts | Standard   | 1.5VDC | Monostable | Standard             | SMT gull wing | 3-1462037-7 |
| IM00JR       |                               |            |        |            |                      | SMT J-leg     | 3-1462037-9 |
| IM00NS       |                               |            |        |            |                      | THT narrow    | 1-1462038-0 |
| IM01GR       |                               |            | 3VDC   |            |                      | SMT gull wing | 1462037-1   |
| IM01JR       |                               |            |        |            |                      | SMT J-leg     | 4-1462037-0 |
| IM01NS       |                               |            |        |            |                      | THT narrow    | 1-1462038-1 |
| IM01TS       |                               |            | 4.5VDC |            |                      | THT standard  | 1462037-4   |
| IM02GR       |                               |            |        |            |                      | SMT gull wing | 1462037-9   |
| IM02JR       |                               |            |        |            |                      | SMT J-leg     | 1-1462037-1 |
| IM02NS       |                               |            | 5VDC   |            |                      | THT narrow    | 1-1462038-2 |
| IM03GR       |                               |            |        |            |                      | SMT gull wing | 1-1462037-4 |
| IM03JR       |                               |            |        |            |                      | SMT J-leg     | 1-1462037-6 |
| IM03NS       |                               |            | 6VDC   |            |                      | THT narrow    | 1-1462038-3 |
| IM03TS       |                               |            |        |            |                      | THT standard  | 1-1462037-8 |
| IM04GR       |                               |            |        |            |                      | SMT gull wing | 4-1462037-2 |
| IM04JR       |                               |            | 9VDC   |            |                      | SMT J-leg     | 4-1462037-4 |
| IM04NS       |                               |            |        |            |                      | THT narrow    | 1-1462038-4 |
| IM05GR       |                               |            |        |            |                      | SMT gull wing | 3-1462037-4 |
| IM05JR       |                               |            | 12VDC  |            |                      | SMT J-leg     | 4-1462037-5 |
| IM05NS       |                               |            |        |            |                      | THT narrow    | 1-1462038-5 |
| IM05TS       |                               |            |        |            |                      | THT standard  | 2-1462037-2 |
| IM06GR       |                               |            | 24VDC  |            |                      | SMT gull wing | 2-1462037-3 |
| IM06JR       |                               |            |        |            |                      | SMT J-leg     | 4-1462037-6 |
| IM06NS       |                               |            |        |            |                      | THT narrow    | 1-1462038-6 |
| IM07GR       |                               |            | 2.4VDC |            |                      | SMT gull wing | 4-1462037-7 |
| IM07JR       |                               |            |        |            |                      | SMT J-leg     | 4-1462037-8 |
| IM07NS       |                               |            |        |            |                      | THT narrow    | 1-1462038-7 |
| IM08GR       |                               |            | 3VDC   |            | High sens.           | SMT gull wing | 6-1462039-3 |
| IM11GR       |                               |            |        |            |                      |               | 9-1462038-5 |
| IM12GR       |                               |            |        |            |                      |               | 1462039-3   |
| IM13GR       |                               |            | 4.5VDC |            |                      |               | 1462039-4   |
| IM16GR       |                               |            |        |            |                      |               | 1462039-5   |
| IM17GR       |                               |            |        |            |                      |               | 1462039-6   |
| IM17TS       |                               |            | 5VDC   |            |                      | THT standard  | 4-1462039-6 |
| *IM21GR      |                               |            |        |            |                      | SMT gull wing | 2-1462039-6 |
| *IM21TS      |                               |            |        |            |                      | THT standard  | 1-1462039-5 |
| *IM22GR      |                               |            | 12VDC  |            | Ultra high sensitive | SMT gull wing | 2-1462039-7 |
| *IM22TS      |                               |            |        |            |                      | THT standard  | 2-1462039-8 |
| *IM23GR      |                               |            |        |            |                      | SMT gull wing | 2-1462039-9 |
| *IM23TS      |                               |            | 5VDC   |            |                      | THT standard  | 3-1462039-0 |
| *IM26GR      |                               |            |        |            |                      | SMT gull wing | 3-1462039-1 |
| *IM26TS      |                               |            |        |            |                      | THT standard  | 3-1462039-2 |
| IM40GR       |                               |            | 1.5VDC | Bistable   | Standard             | SMT gull wing | 5-1462037-1 |
| IM40JR       |                               |            |        |            |                      | SMT J-leg     | 5-1462037-2 |
| IM40NS       |                               |            |        |            |                      | THT narrow    | 1-1462038-8 |
| IM40TS       |                               |            | 3VDC   |            |                      | THT standard  | 5-1462037-0 |
| IM41GR       |                               |            |        |            |                      | SMT gull wing | 5-1462037-4 |
| IM41JR       |                               |            |        |            |                      | SMT J-leg     | 5-1462037-5 |
| IM41NS       |                               |            | 4.5VDC |            |                      | THT narrow    | 1-1462038-9 |
| IM41TS       |                               |            |        |            |                      | THT standard  | 5-1462037-3 |
| IM42GR       |                               |            |        |            |                      | SMT gull wing | 3-1462037-1 |
| IM42JR       |                               |            | 5VDC   |            |                      | SMT J-leg     | 5-1462037-7 |
| IM42NS       |                               |            |        |            |                      | THT narrow    | 2-1462038-0 |
| IM42TS       |                               |            |        |            |                      | THT standard  | 5-1462037-6 |
| IM43GR       |                               |            | 6VDC   |            |                      | SMT gull wing | 5-1462037-9 |
| IM43JR       |                               |            |        |            |                      | SMT J-leg     | 6-1462037-0 |
| IM43NS       |                               |            |        |            |                      | THT narrow    | 2-1462038-1 |
| IM43TS       |                               |            | 9VDC   |            |                      | THT standard  | 5-1462037-8 |
| IM44GR       |                               |            |        |            |                      | SMT gull wing | 6-1462037-2 |
| IM44JR       |                               |            |        |            |                      | SMT J-leg     | 6-1462037-3 |
| IM44NS       |                               |            | 12VDC  |            |                      | THT narrow    | 2-1462038-2 |
| IM44TS       |                               |            |        |            |                      | THT standard  | 6-1462037-1 |
| IM45GR       |                               |            |        |            |                      | SMT gull wing | 6-1462037-4 |
| IM45JR       |                               |            | 24VDC  |            |                      | SMT J-leg     | 6-1462037-5 |
| IM45NS       |                               |            |        |            |                      | THT narrow    | 2-1462038-3 |
| IM46GR       |                               |            |        |            |                      | SMT gull wing | 6-1462037-7 |
| IM46JR       |                               |            |        |            |                      | SMT J-leg     | 6-1462037-8 |
| IM46NS       |                               |            |        |            |                      | THT narrow    | 2-1462038-4 |
| IM46TS       |                               |            |        |            |                      | THT standard  | 6-1462037-6 |
| IM47GR       |                               |            |        |            |                      | SMT gull wing | 7-1462037-0 |
| IM47JR       |                               |            |        |            |                      | SMT J-leg     | 7-1462037-1 |
| IM47NS       |                               |            |        |            |                      | THT narrow    | 2-1462038-5 |
| IM47TS       |                               |            |        |            |                      | THT standard  | 6-1462037-9 |

\* please check with application first for further details

**IM Relay** (Continued)

| Product code | Arrangement | Perf. type | Coil   | Coil type  | Coil       | Terminals     | Part number |
|--------------|-------------|------------|--------|------------|------------|---------------|-------------|
| IM48GR       |             |            | 2.4VDC |            |            | SMT gull wing | 1462039-8   |
| IM01CGR      | 2 form C    | High       | 3VDC   | Monostable | Standard   | SMT gull wing | 1462038-4   |
| IM01CTS      | 2 CO        | dielectric |        |            |            | THT standard  | 9-1462038-6 |
| IM02CGR      | contacts    |            | 4.5VDC |            |            | SMT gull wing | 1462038-1   |
| IM03CGR      |             |            | 5VDC   |            |            |               | 1462038-2   |
| IM03CJR      |             |            |        |            |            | SMT J-leg     | 4-1462039-8 |
| IM03CTS      |             |            |        |            |            | THT standard  | 4-1462039-7 |
| IM05CGR      |             |            | 9VDC   |            |            | SMT gull wing | 1462038-3   |
| IM06CGR      |             |            | 12VDC  |            |            |               | 9-1462037-9 |
| IM06CJR      |             |            |        |            |            | SMT J-leg     | 3-1462039-4 |
| IM06CTS      |             |            |        |            |            | THT standard  | 4-1462037-9 |
| IM07CGR      |             |            | 24VDC  |            |            | SMT gull wing | 1462039-2   |
| IM07CTS      |             |            |        |            |            | THT standard  | 1462039-1   |
| IM17CGR      |             |            |        |            | High sens. | SMT gull wing | 1462039-7   |
| IM41CGR      |             |            | 3VDC   | Bistable   | Standard   |               | 4-1462039-2 |
| IM42CGR      |             |            | 4.5VDC |            |            |               | 4-1462039-1 |
| IM43CGR      |             |            | 5VDC   |            |            |               | 9-1462038-7 |
| IM48CGR      |             |            | 2.4VDC |            |            |               | 9-1462039-0 |
| IM02DGR      |             | High       | 4.5VDC | Monostable | Standard   |               | 9-1462038-8 |
| IM02IJR      |             | current    |        |            |            | SMT J-leg     | 1462047-8   |
| IM02IGR      |             |            |        |            |            | SMT gull wing | 1462047-9   |
| IM03DGR      |             |            | 5VDC   |            |            | SMT gull wing | 9-1462038-9 |
| IM03DJR      |             |            |        |            |            | SMT J-leg     | 3-1462039-3 |
| IM05DGR      |             |            | 9VDC   |            |            | SMT gull wing | 1-1462039-7 |
| IM06DGR      |             |            | 12VDC  |            |            |               | 1-1462039-8 |
| IM06DJR      |             |            |        |            |            | SMT J-leg     | 7-1462039-0 |
| IM06DTS      |             |            |        |            |            | THT standard  | 3-1462039-8 |
| IM07DGR      |             |            | 24VDC  |            |            | SMT gull wing | 3-1462039-7 |
| IM07DJR      |             |            |        |            |            | SMT J-leg     | 7-1462039-4 |
| IM07DTS      |             |            |        |            |            | THT standard  | 7-1462039-2 |
| IM22DTS      |             |            | 4.5VDC |            | U.h.sens.  |               | 7-1462039-6 |
| IM41DGR      |             |            | 3VDC   | Bistable   | Standard   | SMT gull wing | 6-1462039-8 |
| IM42DGR      |             |            | 4.5VDC |            |            |               | 1-1462039-9 |
| IM42DNS      |             |            |        |            |            | THT narrow    | 1-1462039-6 |
| IM46DNS      |             |            | 12VDC  |            |            |               | 1-1462039-2 |
| IM47DJR      |             |            | 24VDC  |            |            | SMT J-leg     | 7-1462039-5 |
| IM48DGR      |             |            | 2.4VDC |            |            | SMT gull wing | 1462039-9   |
| IM49DGR      |             |            | 2VDC   |            |            |               | 2-1462039-2 |
| IM40IGR      |             |            | 1.5VDC |            |            |               | 1462047-7   |
| IM48IGR      |             |            | 2.4VDC |            |            |               | 1462047-1   |
| IM49IGR      |             |            | 2VDC   |            |            |               | 1462047-4   |
| IM02PGR      |             | High       | 4.5VDC | Monostable | Standard   |               | 5-1462039-4 |
| IM02PNS      |             | contact    |        |            |            | THT narrow    | 5-1462039-8 |
| IM03PGR      |             | stability  | 5VDC   |            |            | SMT gull wing | 5-1462039-5 |
| IM03PJR      |             |            |        |            |            | SMT J-leg     | 6-1462039-6 |
| IM03PNS      |             |            |        |            |            | THT narrow    | 5-1462039-9 |
| IM06PGR      |             |            | 12VDC  |            |            | SMT gull wing | 5-1462039-6 |
| IM06PNS      |             |            |        |            |            | THT narrow    | 6-1462039-0 |
| IM42PGR      |             |            | 4.5VDC | Bistable   | Standard   | SMT gull wing | 5-1462039-7 |
| IM42PNS      |             |            |        |            |            | THT narrow    | 7-1462039-8 |
| IM43PGR      |             |            |        |            |            | SMT gull wing | 7-1462039-3 |
| IM46PNS      |             |            | 12VDC  |            |            | THT narrow    | 6-1462039-1 |