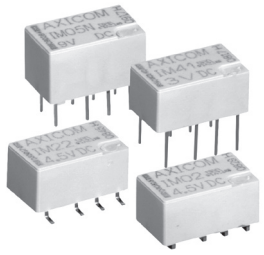
# IM Relay

- **Slim line 10x6mm, low profile 5.65mm and min. board-space 60mm²**
- **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**



IM_

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, automotive applications

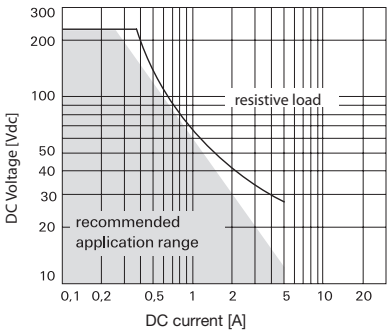
## Approvals

UL 508 File No. E 111441
Technical data of approved types on request

## Contact Data

| Contact Data | standard, C | D | 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 covered | AgNi +Au covered | PdRu +Au covered |
| Contact style | twin contacts | | |
| Minimum switching voltage | 100µV | | |
| Initial contact resistance | <50mΩ at 10mA/30mV | | |
| Thermoelectric potential | <10µV | | |
| Operate time | typ. 1ms, max. 3ms | | |
| Release time | | | |
| without diode in parallel | typ. 1ms, max. 3ms | | |
| with diode in parallel | typ. 3ms, 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) | min. $2.5x10^6$ operations |
| cable load open end | min. $2.0x10^6$ operations |
| resistive, 125VDC / 0.24A - 30W | min. $5x10^5$ operations |
| resistive, 220 VDC / 0.27A - 60W | min. $1x10^5$ operations |
| resistive, 250VAC / 0.25A - 62.5VA | min. $1x10^5$ operations |
| resistive, 30VDC / 1A - 30W | min. $5x10^5$ operations |
| resistive, 30VDC / 2A - 60W | min. $1x10^5$ operations |
| UL contact rating | 30VDC, 2A, 60W, NO only<br>110VDC, 0.3A, 33W<br>220VDC, 0.27A, 60W<br>125VAC, 0.5A, 62.5W<br>250VAC, 0.25A, 62.5W |
| Mechanical endurance | $10^8$ operations |

## Coil Data

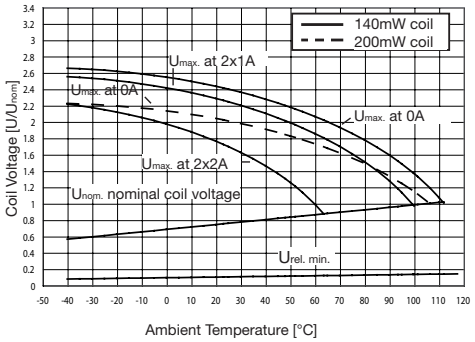
| | |
|---|---|
| Magnetic system | monostable, bistable |
| Coil voltage range | 1.5 to 24VDC |

**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**



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# IM Relay (Continued)

## Coil Data (continued)

**Coil versions, sensitive version, monostable, 1 coil**

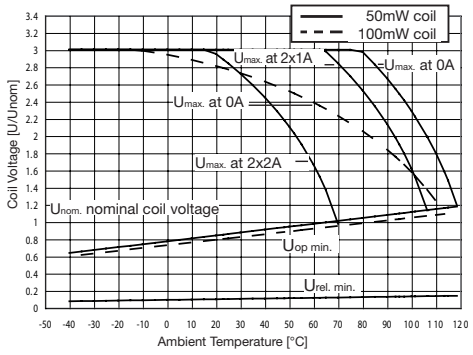
| Coil code | Rated voltage VDC | Operate voltage VDC | Release voltage VDC | Coil resistance Ω±10% | Rated coil power mW |
|---|---|---|---|---|---|
| 11 | 3 | 2.40 | 0.30 | 91 | 100 |
| 12 | 4.5 | 3.60 | 0.45 | 194 | 100 |
| 13 | 5 | 4.00 | 0.50 | 234 | 100 |
| 16 | 12 | 9.60 | 1.20 | 1315 | 110 |
| 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 Ω±10% | Rated coil power mW |
|---|---|---|---|---|---|
| 21 | 3 | 2.55 | 0.30 | 180 | 50 |
| 22 | 4.5 | 3.83 | 0.45 | 405 | 50 |
| 23 | 5 | 4.25 | 0.50 | 500 | 50 |
| 26 | 12 | 10.20 | 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**

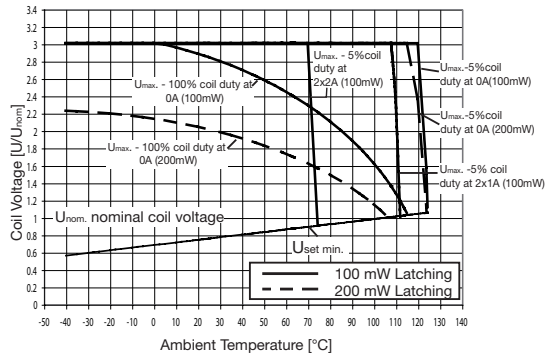



**Coil versions, standard, bistable 1 coil**

| Coil code | Rated voltage VDC | Set voltage VDC | Reset voltage VDC | Coil resistance Ω±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 |
|---|---|---|---|
| | standard, sensitive, ultra high sensitive version | high dielectric version | high current, high contact stability version |
| Initial dielectric strength | | | |
| between open contacts | 1000$V_{rms}$ | 1500$V_{rms}$ | 750$V_{rms}$ |
| between contact and coil | 1800$V_{rms}$ | 1800$V_{rms}$ | 1500$V_{rms}$ |
| between adjacent contacts | 1000$V_{rms}$ | 1800$V_{rms}$ | 750$V_{rms}$ |
| 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 | >$10^9$Ω | >$10^9$Ω | >$10^9$Ω |
| Capacitance | | | |
| between open contacts | | max. 1pF | |
| between contact and coil | | max. 2pF | |
| between adjacent contacts | | max. 2pF | |

## 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 |

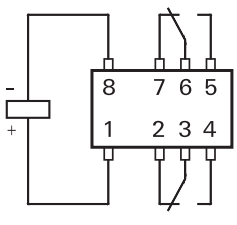
## Other Data

| | |
|---|---|
| Material compliance: EU RoHS/ELV, China RoHS, REACH, Halogen content refer to the Product Compliance Support Center at www.te.com/customersupport/rohssupportcenter | |
| Ambient temperature | -40°C to +85°C |
| Thermal resistance | <150K/W |
| Category of environmental protection | |
| IEC 61810 | RT V - hermetically sealed |
| Degree of protection, IEC 60529 | IP 67, immersion cleanable |
| 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 THT | Peak value |
| IEC 60068-2-20 | 265°C/10s |
| Resistance to soldering heat SMT | |
| IEC 60068-2-58 | 265°C/10s |
| Moisture sensitive level, JEDEC J-Std-020D related only to SMT relays packed in orginal dry-packs | MSL3 |
| Ultrasonic cleaning | not recommended |
| Packaging/unit | |
| THT version | tube/50pcs., box/1000 pcs. |
| SMT version | reel/1000 pcs., box/1000 or 5000 pcs. |

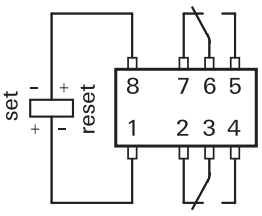
**Terminal assignment**

TOP view on relay

Monostable version
rest condition




Bistable version, 1 coil
reset condition




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



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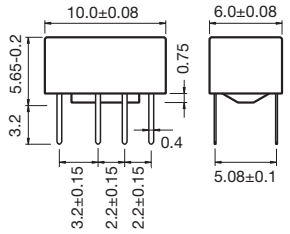
## IM Relay (Continued)

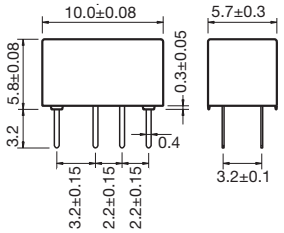
### Dimensions

#### THT version

Standard version

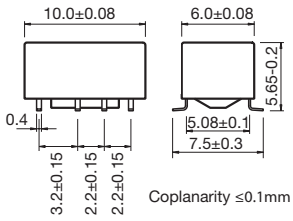



Narrow version

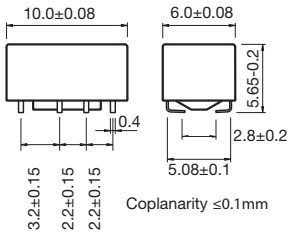



#### SMT version

Gull wings



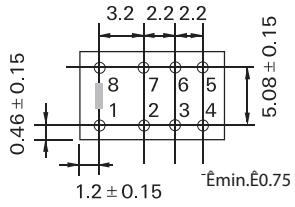

J-legs



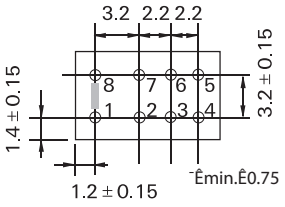

### PCB layout

TOP view on component side of PCB

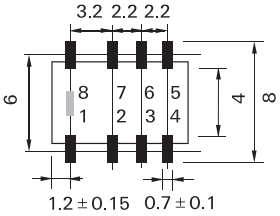
Standard version



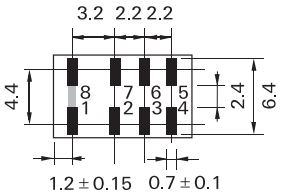

Narrow version




Gull wings



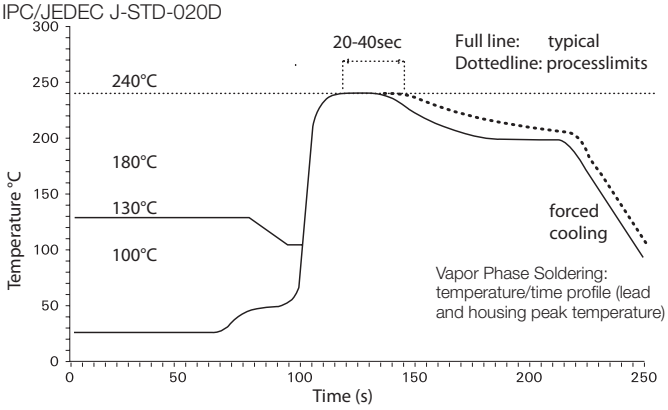

J-legs



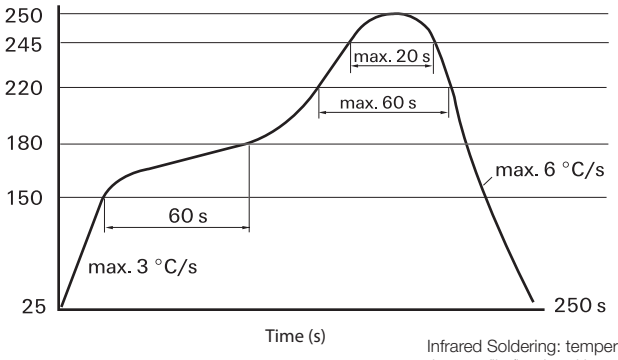

### Processing

Recommended soldering conditions

Soldering conditions according IEC 60058-2-58 and IPC/JEDEC J-STD-020D

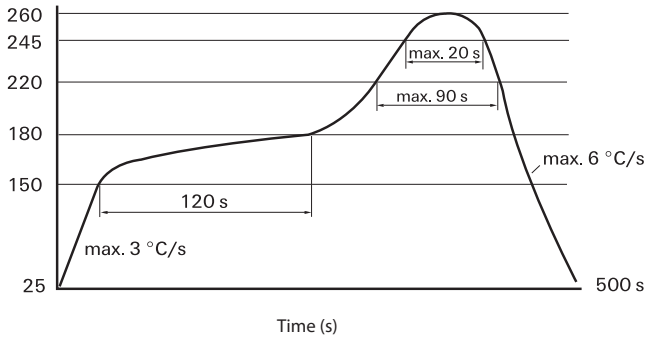



Recommended reflow soldering profile




Infrared Soldering: temperature/ time profile (lead and housing peak temperature)

Resistance to soldering heat - Reflow profile



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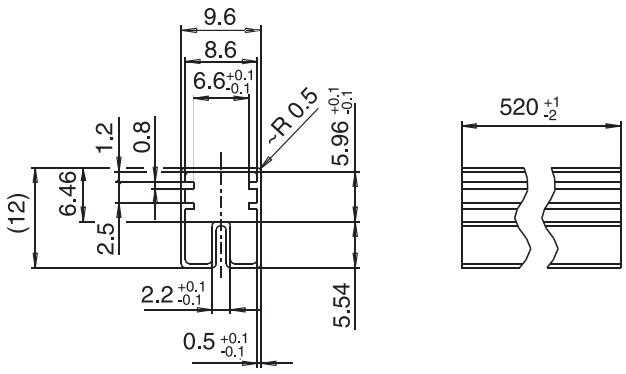
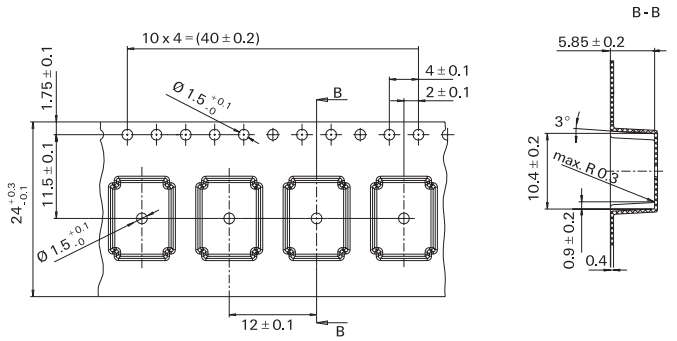
## IM Relay (Continued)

### Packing

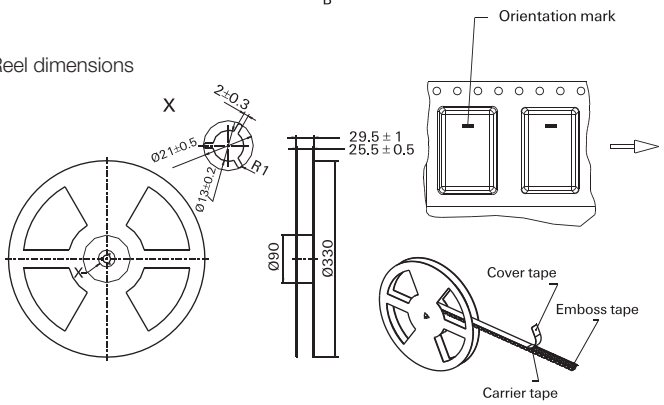
Tube for THT version
50 relays per tube, 1000 relays per box




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 | **C** High dielectric version | | | | |
| | **D** High current version | | | | |
| | **P** High contact stability version | | | | |
| **Terminals** | | | | | |
| **T** THT - standard | **J** SMT - J-leg | | | | |
| **N** THT - narrow version | **G** SMT - gull wing | | | | |
| **Packing** | | | | | |
| **S** Tube | **R** Reel | | | | |



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## IM Relay (Continued)

| Product code | Arrangement | Perf. type | Coil | Coil type | Coil | Terminals | Part number |
|---|---|---|---|---|---|---|---|
| IM00GR | 2 form C, | Standard | 1.5VDC | Monostable | Standard | SMT gull wing | 3-1462037-7 |
| IM00JR | 2 CO | | | | | SMT J-leg | 3-1462037-9 |
| IM00NS | contacts | | | | | 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 | | | | | | THT standard | 1462037-4 |
| IM02GR | | | 4.5VDC | | | SMT gull wing | 1462037-9 |
| IM02JR | | | | | | SMT J-leg | 1-1462037-1 |
| IM02NS | | | | | | THT narrow | 1-1462038-2 |
| IM03GR | | | 5VDC | | | SMT gull wing | 1-1462037-4 |
| IM03JR | | | | | | SMT J-leg | 1-1462037-6 |
| IM03NS | | | | | | THT narrow | 1-1462038-3 |
| IM03TS | | | | | | THT standard | 1-1462037-8 |
| IM04GR | | | 6VDC | | | SMT gull wing | 4-1462037-2 |
| IM04JR | | | | | | SMT J-leg | 4-1462037-4 |
| IM04NS | | | | | | THT narrow | 1-1462038-4 |
| IM05GR | | | 9VDC | | | SMT gull wing | 3-1462037-4 |
| IM05JR | | | | | | SMT J-leg | 4-1462037-5 |
| IM05NS | | | | | | THT narrow | 1-1462038-5 |
| IM05TS | | | | | | THT standard | 2-1462037-2 |
| IM06GR | | | 12VDC | | | SMT gull wing | 2-1462037-3 |
| IM06JR | | | | | | SMT J-leg | 4-1462037-6 |
| IM06NS | | | | | | THT narrow | 1-1462038-6 |
| IM07GR | | | 24VDC | | | SMT gull wing | 4-1462037-7 |
| IM07JR | | | | | | SMT J-leg | 4-1462037-8 |
| IM07NS | | | | | | THT narrow | 1-1462038-7 |
| IM08GR | | | 2.4VDC | | | SMT gull wing | 6-1462039-3 |
| IM11GR | | | 3VDC | | High sens. | | 9-1462038-5 |
| IM12GR | | | 4.5VDC | | | | 1462039-3 |
| IM13GR | | | 5VDC | | | | 1462039-4 |
| IM16GR | | | 12VDC | | | | 1462039-5 |
| IM17GR | | | 24VDC | | | | 1462039-6 |
| IM17TS | | | | | | THT standard | 4-1462039-6 |
| IM21GR | | | 3VDC | | Ultra | SMT gull wing | 2-1462039-6 |
| IM21TS | | | | | high | THT standard | 1-1462039-5 |
| IM22GR | | | 4.5VDC | | sensitive | SMT gull wing | 2-1462039-7 |
| IM22TS | | | | | | THT standard | 2-1462039-8 |
| IM23GR | | | 5VDC | | | SMT gull wing | 2-1462039-9 |
| IM23TS | | | | | | THT standard | 3-1462039-0 |
| IM26GR | | | 12VDC | | | 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 | | | | | | THT standard | 5-1462037-0 |
| IM41GR | | | 3VDC | | | SMT gull wing | 5-1462037-4 |
| IM41JR | | | | | | SMT J-leg | 5-1462037-5 |
| IM41NS | | | | | | THT narrow | 1-1462038-9 |
| IM41TS | | | | | | THT standard | 5-1462037-3 |
| IM42GR | | | 4.5VDC | | | SMT gull wing | 3-1462037-1 |
| IM42JR | | | | | | SMT J-leg | 5-1462037-7 |
| IM42NS | | | | | | THT narrow | 2-1462038-0 |
| IM42TS | | | | | | THT standard | 5-1462037-6 |
| IM43GR | | | 5VDC | | | SMT gull wing | 5-1462037-9 |
| IM43JR | | | | | | SMT J-leg | 6-1462037-0 |
| IM43NS | | | | | | THT narrow | 2-1462038-1 |
| IM43TS | | | | | | THT standard | 5-1462037-8 |
| IM44GR | | | 6VDC | | | SMT gull wing | 6-1462037-2 |
| IM44JR | | | | | | SMT J-leg | 6-1462037-3 |
| IM44NS | | | | | | THT narrow | 2-1462038-2 |
| IM44TS | | | | | | THT standard | 6-1462037-1 |
| IM45GR | | | 9VDC | | | SMT gull wing | 6-1462037-4 |
| IM45JR | | | | | | SMT J-leg | 6-1462037-5 |
| IM45NS | | | | | | THT narrow | 2-1462038-3 |
| IM46GR | | | 12VDC | | | 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 | | | 24VDC | | | 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 |
| IM48GR | | | 2.4VDC | | | SMT gull wing | 1462039-8 |



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## IM Relay (Continued)

| Product code | Arrangement | Perf. type | Coil | Coil type | Coil | Terminals | Part number |
|---|---|---|---|---|---|---|---|
| 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 | | | SMT gull wing | 1462038-2 |
| IM03CJR | | | | | | SMT J-leg | 4-1462039-8 |
| IM03CTS | | | | | | THT standard | 4-1462039-7 |
| IM05CGR | | | 9VDC | | | SMT gull wing | 1462038-3 |
| IM06CGR | | | 12VDC | | | SMT gull wing | 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 |
| IM02DGR | | High | 4.5VDC | Monostable | Standard | | 9-1462038-8 |
| IM03DGR | | current | 5VDC | | | | 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 |
| 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 |



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