# COMMERCIAL SENSITIVE TO-5 RELAYS DPDT

| SERIES | RELAY TYPE |
|---|---|
| 732 | DPDT basic relay |
| 732D | DPDT relay with internal diode for coil transient suppression |
| 732TN | DPDT relay with internal transistor driver and coil transient suppression diode |

## DESCRIPTION

The TO-5 relay, originally conceived and developed by Teledyne, has become one of the industry standards for low-level switching from dry circuit to 1 ampere. Designed for high-density PC board mounting, the Series 732 relays are some of the most versatile ultraminiature relays available because of their small size and low coil power dissipation.

The following unique construction features and manufacturing techniques provide excellent resistance to environmental extremes and overall high reliability:

**The 732 feature:**

•All welded construction.
- Unique uni-frame design providing high magnetic efficiency and mechanical rigidity.
- High force/mass ratios for resistance to shock and vibration.
- Advanced cleaning techniques provide maximum assurance of internal cleanliness.
- Precious metal alloy contact material with gold plating assures excellent high current and dry circuit switching capabilities.

The Series 732D relay has an internal discrete silicon diode for coil transient suppression. The hybrid Series 732TN relay has an internal silicon diode and transistor driver. The integrated packaging of the relay with its associated semiconductor devices greatly reduces PC board floor space requirements as well as component installation costs.

By virtue of its inherently low intercontact capacitance and contact circuit losses, the 732 has proven to be excellent ultraminiature RF switch for frequency ranges well into the UHF spectrum. A typical RF application for the TO-5 relay is in handheld radio transceivers, wherein the combined features of good RF performance, small size, low coil power dissipation and high reliability make it a preferred method of Transmit-Receive switching

## *Part Numbering System*

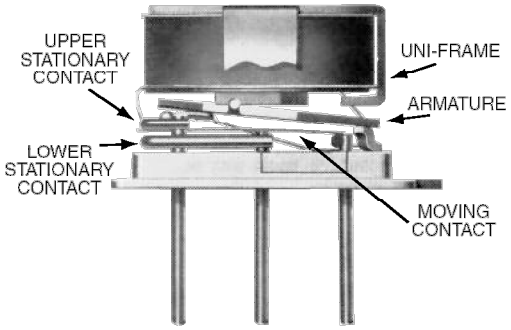
732 YZ M4 - 26 / S Q

- 732: Relay Series
- YZ: Ground Pin Option (See Appendix)
- M4: Pad Option (See Appendix)
- 26: Nominal Coil Voltage (26 = 26.5 V, See Page 2 for more Voltages)
- S: S = 0.187" Leads; No Suffix = 0.75" Leads
- Q: Q = Solder-Coated Leads[1]; G = Gold-Plated Leads (RoHS Compliant); R = RoHS Compliant Solder[2]

## ENVIRONMENTAL AND PHYSICAL SPECIFICATIONS

| | |
|---|---|
| **Temperature** (Operating) | –55°C to +85°C |
| **Vibration** (General Note I) | 10 g's to 500 Hz |
| **Shock** (General Note I) | 30 g's, 6ms half sine |
| **Enclosure** | Hermetically sealed |
| **Weight** | 0.09 oz. (2.55g) max. |

## INTERNAL CONSTRUCTION

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## SERIES 732
## GENERAL ELECTRICAL SPECIFICATIONS (@25°C)

| | | |
|---|---|---|
| **Contact Arrangement** | 2 Form C (DPDT) | |
| **Rated Duty** | Continuous | |
| **Contact Resistance** | 0.15 Ω max.; 0.25 Ω max. afterlife at A / 28 Vdc | |
| **Contact Load Rating (DC)** | Resistive: 1 A/ 28 Vdc<br>Inductive: 200 mA/ 28 Vdc (320mH)<br>Lamp: 100 mA / 28 Vdc (320mH)<br>Low level: 10 to 50 µA @ 10 to 50 mV | |
| **Contact Load Rating (AC)** | Resistive: 250 mA / 115Vac, 60 and 400 Hz (Case not grounded)<br>100 mA / 115 Vac, 60 and 400 Hz (Case grounded) | |
| **Contact Life Ratings** | 10,000,000 cycles (typical) at low level<br>1,000,000 cycles (typical) at 0.5 A / 28 Vdc resistive<br>100,000 cycles min. at all other loads specified above | |
| **Contact Overload Rating** | 2 A / 28 Vdc Resistive (100 cycles min.) | |
| **Coil Operating Power** | 200 mW typical at nominal rated voltage | |
| **Contact Carry Rating** | Contact Factory | |
| **Operate Time** | 6.0 msec max. at nominal rated coil voltage | |
| **Release Time** | 732: 3.0 ms max. | 732D, 732TN: 7.5 ms max. |
| **Intercontact Capacitance** | 0.4 pf typical | |
| **Insulation Resistance** | 1,000 MΩ min. between mutually isolated terminals | |
| **Dielectric Strength** | 350 Vrms (60 Hz) @ atmospheric pressure | |
| **Negative Coil Transient (Vdc)** | 2.0 Vdc Max. | |
| **Diode P.I.V. (Vdc)** | 60 Vdc Min. | |
| **732TN Transistor Characteristics** | Base Voltage to Turn Off (Vdc) | 0.3 min |
| | Emitter-Base breakdown Voltage ($BV_{EBO}$) (Vdc) | 6.0 min |
| | Collector-Base breakdown Voltage ($BV_{CBO}$) (Vdc) | 60 min |

## DETAILED ELECTRICAL SPECIFICATIONS (@25°C)

| **BASE PART NUMBERS (732, 732D, 732TN)** | | **732-5<br>732D-5<br>732TN-5** | **732-12<br>732D-12<br>732TN-12** | **732-26<br>732D-26<br>732TN-26** |
|---|---|---|---|---|
| **Coil Voltage** | **Nom.** | 5.0 | 12.0 | 26.5 |
| | **Max.** | 7.5 | 20.0 | 40.0 |
| **Coil Resistance (Ohms ±20%)** | | 100 | 850 | 3300 |
| **Pick-up Voltage (Vdc, Max.) Pulse Operation** | | 3.5 | 9.0 | 18.0 |
| **732TN Base Current to Turn On (mAdc, min.)** | | 1.5 | 0.47 | 0.24 |

## PERFORMANCE CURVES (Note 2)

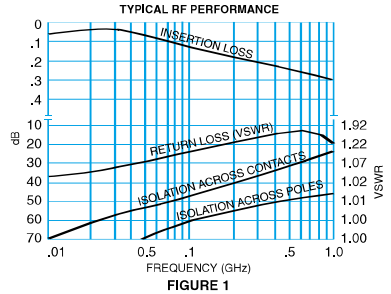


FIGURE 1

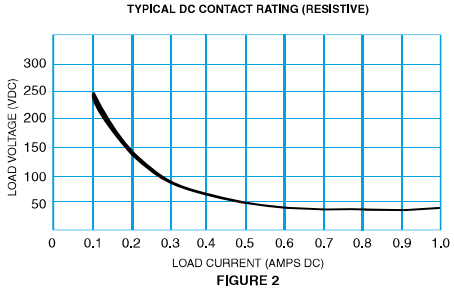


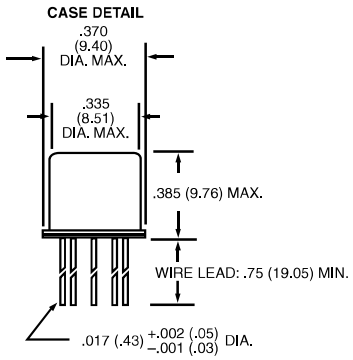
FIGURE 2

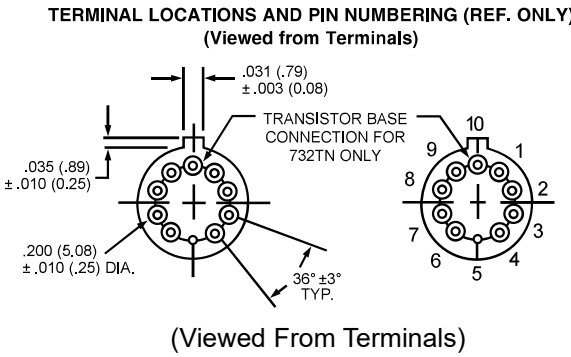
**GENERAL NOTES**

1. Relay contacts will exhibit no chatter in excess of 10 µsec or transfer in excess of 1 µsec.
2. "Typical" characteristics are based on available data and are best estimates. No on-going verification tests are performed.
3. Unless otherwise specified, parameters are initial values.
4. Relays can be supplied with a spacer pad. See appendix.

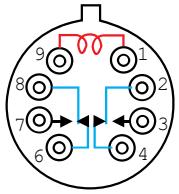

SPECIFICATIONS ARE SUBJECT TO CHANGE WITHOUT NOTICE © 2019 TELEDYNE RELAYS

## SERIES 732
## OUTLINE DIMENSIONS

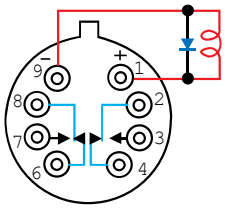


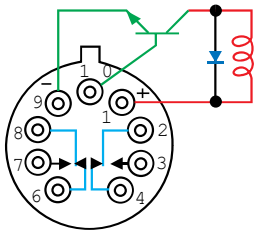

## SCHEMATIC DIAGRAMS




732




732D

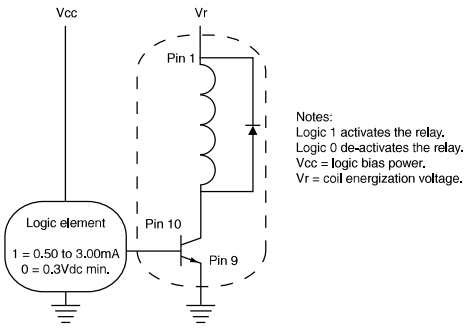



732TN

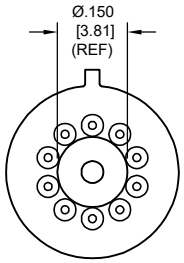
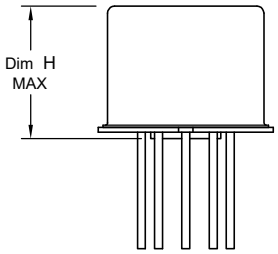
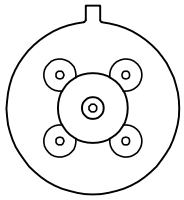
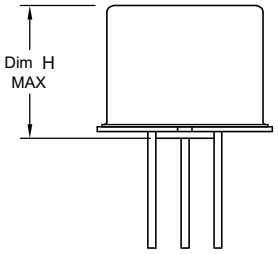
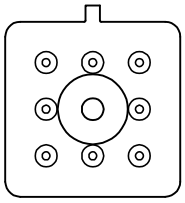
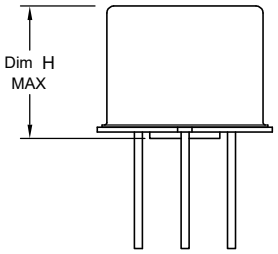
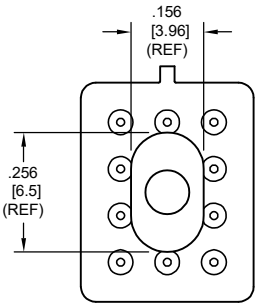
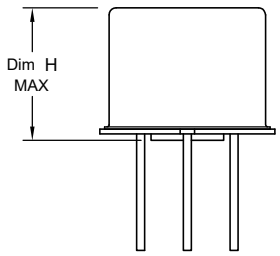
**NOTES:**

1. RELAY CONTACTS WILL EXHIBIT NO CHATTER IN EXCESS OF 10 MSEC OR TRANSFER IN EXCESS OF 1 MSEC.
2. "TYPICAL" CHARACTERISTICS ARE BASED ON AVAILABLE DATA AND ARE BEST ESTIMATES. NO ON-GOING VERIFICATION TESTS ARE PERFORMED.
3. UNLESS OTHERWISE SPECIFIED, PARAMETERS ARE INTIAL VALUES.
4. FOR REFERENCE ONLY. COIL RESISTANCE NOT DIRECTLY MEASURABLE ON 732TN RELAYS.
5. CIRCUIT IS TYPICAL FOR ALL SERIES 732TN. VALUES SHOWN ARE FOR 732TN-5 RELAY AND APPLY FOR FULL TEMPERATURE RANGE.LIMIT BASE-EMITTER CURRENT TO 15 MADC.
6. UNLESS OTHERWISE SPECIFIED, RELAYS WILL BE SUPPLIED WITH EITHER GOLD-PLATED OR SOLDER-COATED LEADS.
7. THE SLASH AND CHARACTERS APPEARING AFTER THE SLASH ARE NOT MARKED ON THE RELAY.

## TYPICAL LOGIC INTERFACE
(See Note 5)



# APPENDIX A : Spacer Pads

| Pad designation and bottom view dimensions | Height | For use with the following: | Dim. H Max. |
|---|---|---|---|
|  “M4” Pad for TO-5 |  | ER412 | .295 (7.49) |
| | | 712, RF300, RF, RF700, RF703 | .300 (7.62) |
| | | ER422, 722 | .305 (7.75) |
| | | ER432 | .400 (10.16) |
| | | 732, RF303 | .410 (10.41) |
| | | RF312 | .350 (8.89) |
|  “M4” Pad for TO-5 |  | ER411 | .295 (7.49) |
| | | RF311 | .300 (7.62) |
| | | RF331 | .410 (10.41) |
|  “M4” Pad for Centigrid® |  | 172 | .305 (7.75) |
| | | ER114, J114 | .300 (7.62) |
| | | ER134, J134 | .400 (10.16) |
| | | RF100 | .315 (8.00) |
| | | RF103 | .420 (10.67) |
|  “M9” Pad for Centigrid® |  | 122C, A152 | .320 (8.13) |
| | | ER116C, J116C | .300 (7.62) |
| | | ER136C, J136C | .400 (10.16) |
| | | RF180 | .325 (8.25) |
| | | A150 | .305 (7.75) |

**Notes:**

1. Spacer pad material: Polyester film.
2. To specify an “M4” or “M9” spacer pad, refer to the mounting variants portion of the part numbering example in the applicable datasheet.
3. Dimensions are in inches (mm).
4. Unless otherwise specified, tolerance is ± .010” (.25 mm).
5. Add 10 mΩ to the contact resistance shown in the datasheet.
6. Add 0.01 oz. (0.25 g) to the weight of the relay assembly shown in the datasheet.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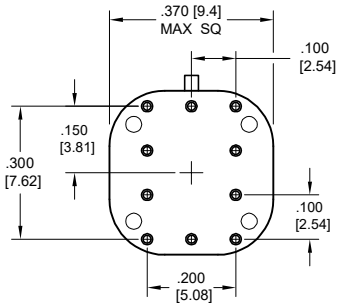
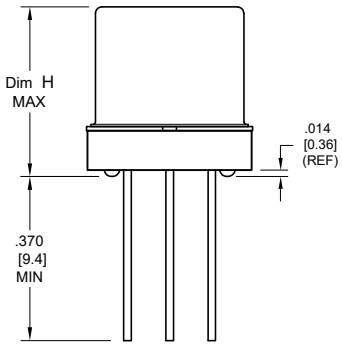
# APPENDIX A : Spreader Pads

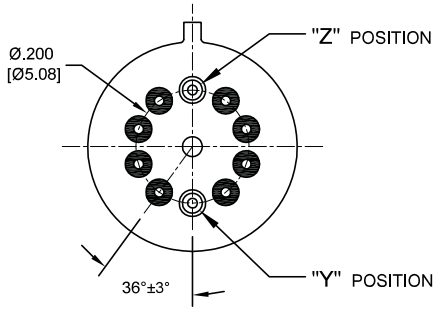
| Pad designation and bottom view dimensions | Height | For use with the following: | Dim. H Max. |
|---|---|---|---|
|  "M" Pad 5/ 6/ |  | ER411T, ER412, J412 | .388 (9.86) |
| | | 712 | .393 (9.99) |
| | | ER432, J432 | .493 (12.52) |
| | | 732 | .503 (12.78) |
| | | J421, J422, ER422, 722 | .398 (10.11) |

**Notes:**

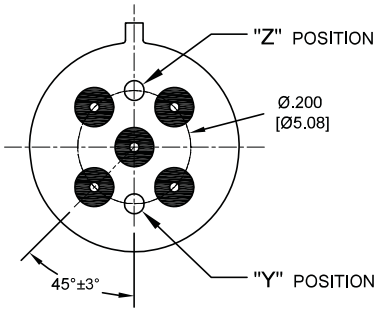
1. Spreader pad material: Diallyl Phthalate.
2. To specify an "M", "M2" or "M3" spreader pad, refer to the mounting variants portion of the part number example in the applicable datasheet.
3. Dimensions are in inches (mm).
4. Unless otherwise specified, tolerance is ± .010" (0.25 mm).

5/. Add 25 mΩ to the contact resistance shown in the datasheet.
6/. Add .01 oz. (0.25 g) to the weight of the relay assembly shown in the datasheet.
7/. Add 50 mΩ to the contact resistance shown in the datasheet.
8/. Add 0.025 oz (0.71 g) to the weight of the relay assembly shown in the datasheet.
9/. M3 pad to be used only when the relay has a center pin (e.g. ER411M3-12A, 722XM3-26.)

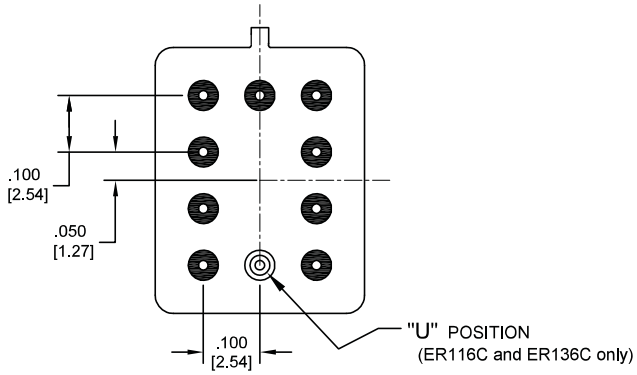
# APPENDIX A : Ground Pin Positions



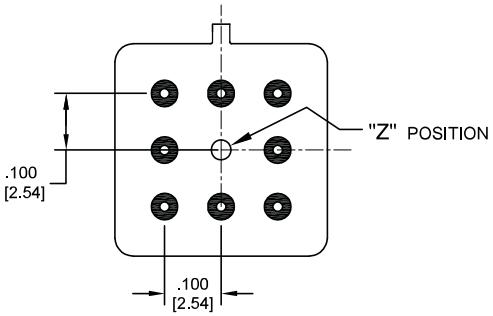

**TO-5 Relays:**
ER412, ER412T, ER422, ER432, ER432T, 712, 712TN, 400H, 400K, 400V, RF300, RF303, RF341, RF312, RF332, RF310, RF313, RF320, RF323, SI800, SI803, RF700, RF703



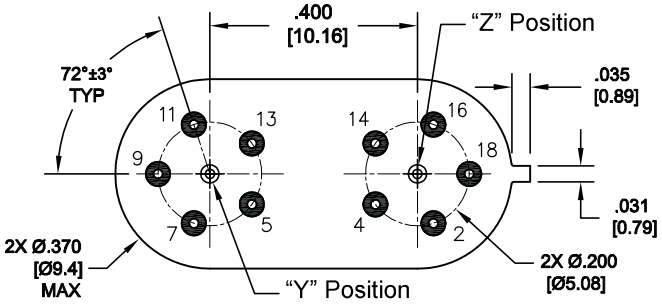

**TO-5 Relays:**
ER411, RF311, RF331




**Centigrid® Relays:**
RF180, ER116C, 122C, ER136C




**Centigrid® Relays:**
RF100, RF103, ER114, ER134, 172




**Loopback Relays:**
LB363

○ Indicates ground pin position

● Indicates glass insulated lead position

◎ Indicates ground pin or lead position depending on relay type

**NOTES**
1. Terminal views shown
2. Dimensions are in inches (mm)
3. Tolerances: ± .010 (±.25) unless otherwise specified
4. Ground pin positions are within .015 (0.38) dia. of true position
5. Ground pin head dia., 0.035 (0.89) ref: height 0.010 (0.25) ref.
6. Lead dia. 0.017 (0.43) nom.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# OCEAN CHIPS
## Океан Электроники
## Поставка электронных компонентов

Компания «Океан Электроники» предлагает заключение долгосрочных отношений при поставках импортных электронных компонентов на взаимовыгодных условиях!

Наши преимущества:

- Поставка оригинальных импортных электронных компонентов напрямую с производств Америки, Европы и Азии, а так же с крупнейших складов мира;
- Широкая линейка поставок активных и пассивных импортных электронных компонентов (более 30 млн. наименований);
- Поставка сложных, дефицитных, либо снятых с производства позиций;
- Оперативные сроки поставки под заказ (от 5 рабочих дней);
- Экспресс доставка в любую точку России;
- Помощь Конструкторского Отдела и консультации квалифицированных инженеров;
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- Поставка электронных компонентов под контролем ВП;
- Система менеджмента качества сертифицирована по Международному стандарту ISO 9001;
- При необходимости вся продукция военного и аэрокосмического назначения проходит испытания и сертификацию в лаборатории (по согласованию с заказчиком);
- Поставка специализированных компонентов военного и аэрокосмического уровня качества (Xilinx, Altera, Analog Devices, Intersil, Interpoint, Microsemi, Actel, Aeroflex, Peregrine, VPT, Syfer, Eurofarad, Texas Instruments, MS Kennedy, Miteq, Cobham, E2V, MA-COM, Hittite, Mini-Circuits, General Dynamics и др.);

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(Применяются в военной, авиационной, аэрокосмической, морской, железнодорожной, горно- и нефтедобывающей отраслях промышленности)

**«FORSTAR»** (основан в 1998 г.)

ВЧ соединители, коаксиальные кабели, кабельные сборки и микроволновые компоненты:

(Применяются в телекоммуникациях гражданского и специального назначения, в средствах связи, РЛС, а так же военной, авиационной и аэрокосмической отраслях промышленности).

FORSTAR®

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