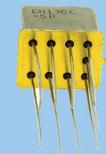




CENTIGRID® ESTABLISHED RELIABILITY MILITARY DPDT SENSITIVE CMOS COMPATIBLE



SERIES	RELAY TYPE
136C	DPDT sensitive relay with internal power MOSFET driver, Zener diode gate protection, and diode coil suppression

DESCRIPTION

The 136C Centigrid® relay is an ultraminiature, hermetically sealed, armature relay capable of being directly driven by most IC logic families. Its low profile height and .100" grid spaced terminals, which preclude the need for spreader pads, make it ideal for applications where extreme packaging density and/or close PC board spacing are required.

The basic concept and internal mechanical structure are similar to the 114 DPDT relay. The following unique construction features and manufacturing techniques provide overall high reliability and excellent resistance to environmental extremes:

The 136C feature:

- All welded construction.
- Advanced cleaning techniques provide maximum assurance of internal cleanliness.
- Unique uni-frame design providing high magnetic efficiency and

mechanical rigidity.

- High force/mass ratios for resistance to shock and vibration.
- Precious metal alloy contact material with gold plating assures excellent high current and dry circuit switching capabilities.

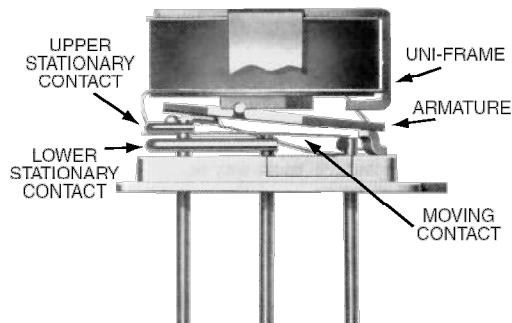
By virtue of its inherently low intercontact capacitance and contact circuit losses, the 136C relay has proven to be an excellent ultraminiature RF switch for frequency ranges well into the UHF spectrum. A typical RF application for this Centigrid® relay is in handheld radio transceivers, wherein the combined features of good RF performance, small size, low coil power dissipation and high reliability make it a preferred method of Transmit-Receive switching (see Figure 1).

The Series 136C utilizes an internal silicon diode for coil suppression, a Zener diode to protect the MOSFET gate input, and an N-channel enhancement mode MOSFET chip, which enables direct relay interfacing with most Microprocessor and IC logic families (CMOS, TTL and MOS).

ENVIRONMENTAL AND PHYSICAL SPECIFICATIONS

Temperature (Ambient)	-65°C to +125°C
Vibration (General Note I)	30 g's to 3000 Hz
Shock (General Note I)	75 g's, 6ms half sine
Acceleration	50 g's
Enclosure	Hermetically sealed
Weight	0.18 oz. (5.11g) max.

INTERNAL CONSTRUCTION

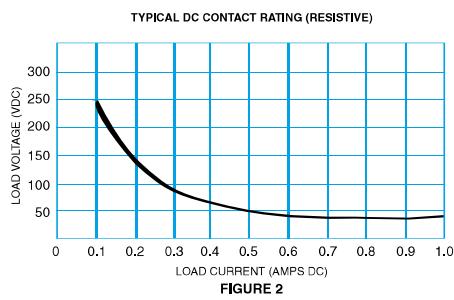
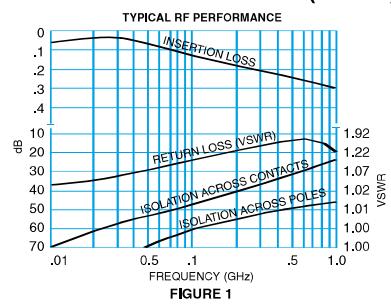


SERIES 136C
GENERAL ELECTRICAL SPECIFICATIONS (@25°C)

Contact Arrangement	2 Form C (DPDT)	
Rated Duty	Continuous	
Contact Resistance	0.1 ohm max. before life; 0.2 ohm max. after life at 1A/28Vdc	
Contact Load Rating (DC)	Resistive: 1 A / 28 Vdc Inductive: 200 mA / 28 Vdc (320mH) Lamp: 100 mA / 28 Vdc (320mH) Low level: 10 to 50 μ A @ 10 to 50 mV	
Contact Load Rating (AC)	Resistive: 250 mA / 115Vac, 60 and 400 Hz (Case not grounded) 100 mA / 115 Vac, 60 and 400 Hz (Case grounded)	
Contact Life Ratings	10,000,000 cycles (typical) at low level 1,000,000 cycles (typical) at 0.5 A / 28 Vdc resistive 100,000 cycles min. at all other loads specified above	
Contact Overload Rating	2 A / 28 Vdc Resistive (100 cycles min.)	
Contact Carry Rating	Contact Factory	
Operate Time	4.0 msec max. at nominal rated coil voltage	
Release Time	7.5 ms max.	
Contact Bounce	1.5 msec max.	
Intercontact Capacitance	0.4 pf typical	
Insulation Resistance	10,000 M Ω min. between mutually isolated terminals	
Dielectric Strength (Vrms/60)	Atmospheric pressure: 500 Vrms	70,000 ft: 125
Negative Coil Transient (Vdc)	1.0 Vdc Max.	
Diode P.I.V. (Vdc)	100 Vdc Min.	
Zener Voltage (Vdc)	Min.	17
	Max.	23
Zener Leakage Current (μ A at 15.2 Vdc) (max.)	2.5	
Power FET Characteristics (-65°C to +125°C) (Vdc, Max.)	Turn Off Gate Voltage	0.5
	Turn On Gate Voltage	3.8 (Note 4)
	Drain-Source Voltage	55

136C Series
DETAILED ELECTRICAL SPECIFICATIONS (@25°C)

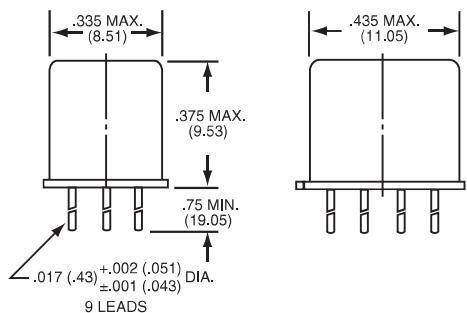
BASE PART NUMBERS (136C)		136C-5	136C-12	136C-26
Coil Voltage	Nom.	5.0	12.0	26.5
	Max.	5.6	16.0	32.0
Coil Current (mAdc@25°C)	Max.	56.0	17.7	10.2
	Min.	43.0	11.3	5.8
Coil Operating Power (mW, nominal)		250	180	219
Pick-up Voltage (Vdc, Max) (Note 4)		4.0	9.8	19.5
Pick-up Voltage (Vdc) (Note 4)	Min.	0.13	0.36	0.72
	Max.	2.3	6.5	13.0

PERFORMANCE CURVES (Note 2)

GENERAL NOTES

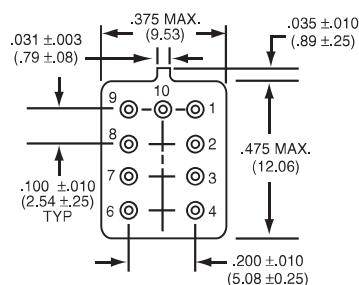
1. Relay contacts will exhibit no chatter in excess of 10 μ sec or transfer in excess of 1 μ sec.
2. "Typical" characteristics are based on available data and are best estimates. No on-going verification tests are performed.
3. Unless otherwise specified, parameters are initial values.
4. Relays can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

NOTES:

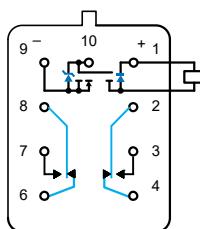
1. Relay contacts will exhibit no chatter in excess of 10 μ sec or transfer in excess of 1 μ sec.
2. "Typical" characteristics are based on available data and are best estimates. No on-going verification tests are performed.
3. Unless otherwise specified, parameters are initial values.
4. Maximum rated gate voltage = 15 Vdc.
5. Unless otherwise specified, relays will be supplied with either gold plated or solder coated leads.
6. The slash and character appearing after the slash are not marked on the relay.
7. Screened HI-REL versions available. Contact factory.

SERIES 136C
OUTLINE DIMENSIONS
CASE DETAIL


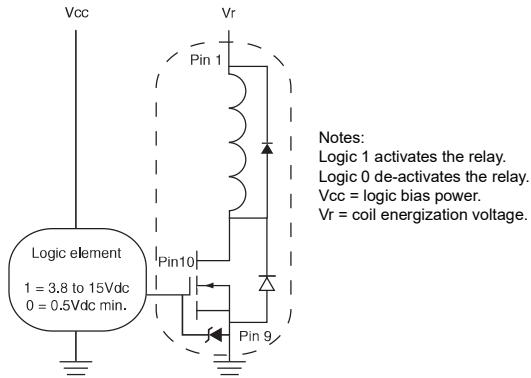
Dimensions: in. (mm)

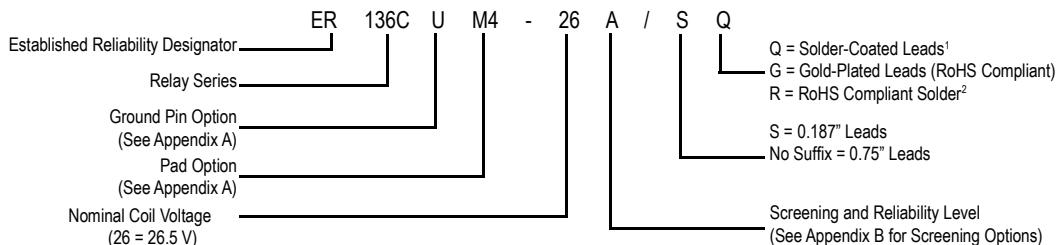
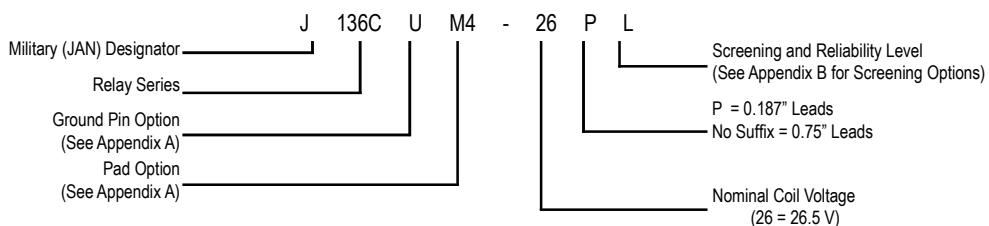


(Viewed From Terminals)

SCHEMATIC DIAGRAMS

 PIN 1: + Supply
 PIN 9: - Supply
 PIN 10: GATE

136C

TYPICAL CMOS INTERFACE CIRCUIT
 DC Logic Voltage Supply

 Notes:
 Logic 1 activates the relay.
 Logic 0 de-activates the relay.
 Vcc = logic bias power.
 Vr = coil energization voltage.

Part Numbering System

 Q = Solder-Coated Leads¹
 G = Gold-Plated Leads (RoHS Compliant)
 R = RoHS Compliant Solder²
 S = 0.187" Leads
 No Suffix = 0.75" Leads
 Screening and Reliability Level
 (See Appendix B for Screening Options)


APPENDIX A : Spacer Pads

Pad designation and bottom view dimensions	Height	For use with the following:	Dim. H Max.
 "M4" Spacer Pad for TO-5		ER412 712, RF300, RF, RF700, RF703 ER422, 722 ER432 732, RF303 RF312	.295 (7.49) .300 (7.62) .305 (7.75) .400 (10.16) .410 (10.41) .350 (8.89)
 "M4" Spacer Pad for TO-5		ER411 RF311 RF331	.295 (7.49) .300 (7.62) .410 (10.41)
 "M4" Spacer Pad for Centigrid®		172 ER114, J114 ER134, J134 RF100 RF103	.305 (7.75) .300 (7.62) .400 (10.16) .315 (8.00) .420 (10.67)
 "M9" Spacer Pad for Centigrid®		122C, A152 ER116C, J116C ER136C, J136C RF180 A150	.320 (8.13) .300 (7.62) .400 (10.16) .325 (8.25) .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 $\pm .010"$ (.25 mm).
5. Add 10 m Ω 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.

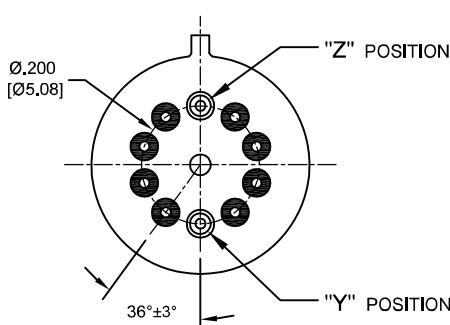
APPENDIX A : Spreader Pads

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

Notes:

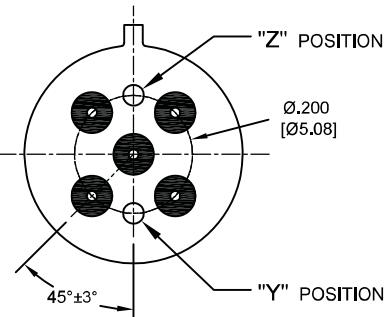
1. Spreader pad material: Diallyl Phthalate.
2. To specify an "M", "M2" or "M3" spreader pad, refer to the mounting variants portion of the part number example in the applicable datasheet.
3. Dimensions are in inches (mm).
4. Unless otherwise specified, tolerance is $\pm .010$ " (0.25 mm).
- 5/. Add 25 m Ω 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 m Ω 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



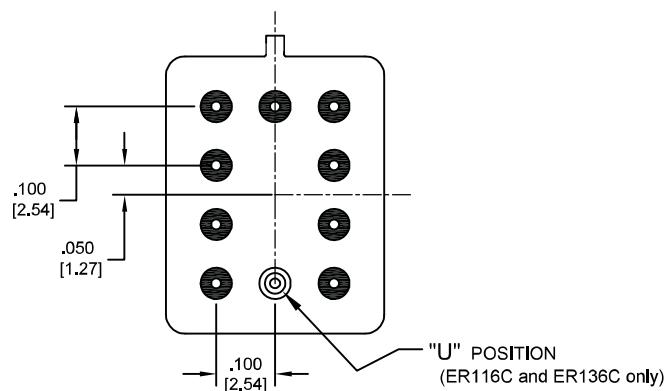
TO-5 Relays:

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



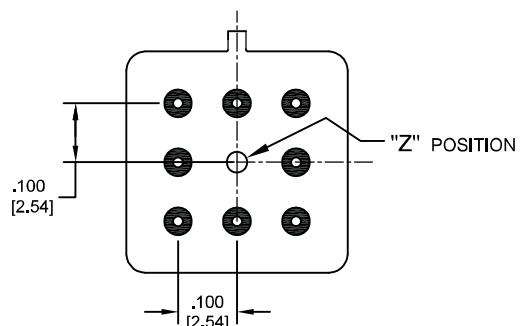
TO-5 Relays:

ER411, RF311, RF331



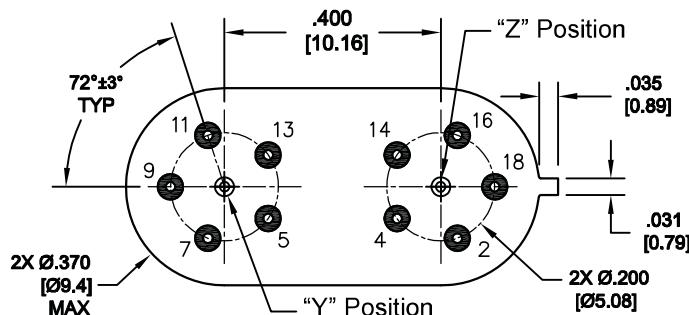
Centigrid® Relays:

RF180, ER116C, 122C, ER136C



Centigrid® Relays:

RF100, RF103, ER114, ER134, 172



Loopback Relays:

LB363

NOTES

- Indicates ground pin position
- Indicates glass insulated lead position
- ◎ Indicates ground pin or lead position depending on relay type

1. Terminal views shown
2. Dimensions are in inches (mm)
3. Tolerances: $\pm .010$ ($\pm .25$) 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.