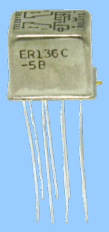


CENTIGRID®
ESTABLISHED RELIABILITY
MILITARY
DPDT
SENSITIVE CMOS COMPATIBLE

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

DESCRIPTION

The sensitive 136C Centigrid® relay is an ultraminiature, hermetically sealed, armature relay capable of being directly driven by most IC logic families. Its .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 134 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.
- Low operating power

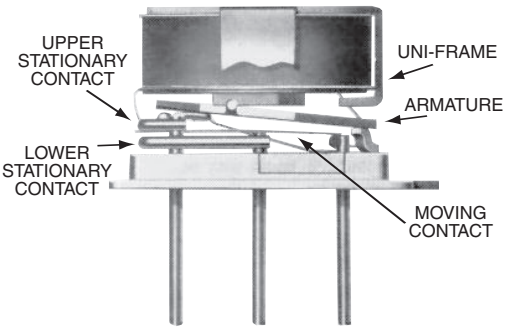
By virtue of its inherently low intercontact capacitance and contact circuit losses, the 136C relay has proven to be an excellent ultraminiature RF switch for frequency ranges well into the UHF spectrum. A typical RF application for this Centigrid® relay is in handheld radio transceivers, wherein the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

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

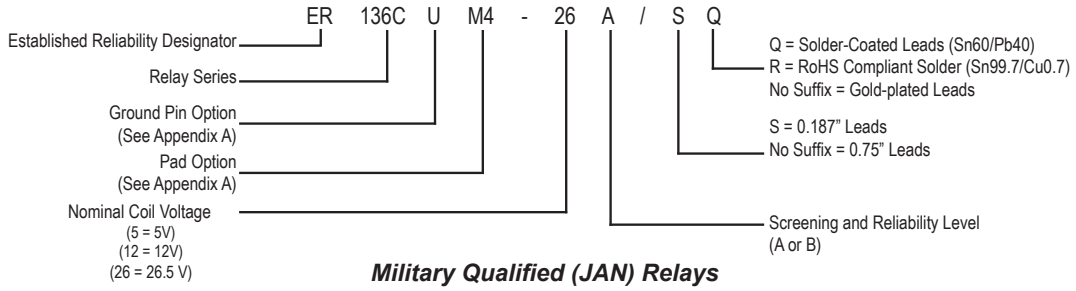
Temperature (Ambient)	–65°C to +125°C
Vibration (Note 1)	30 g's to 3000 Hz
Shock (Note 1)	75 g's, 6ms half sine
Acceleration	50 g's
Enclosure	Hermetically sealed
Weight	0.18 oz. (5.11g) max.
Reflow Temperature	260°C max. temp. 1 min. max

INTERNAL CONSTRUCTION

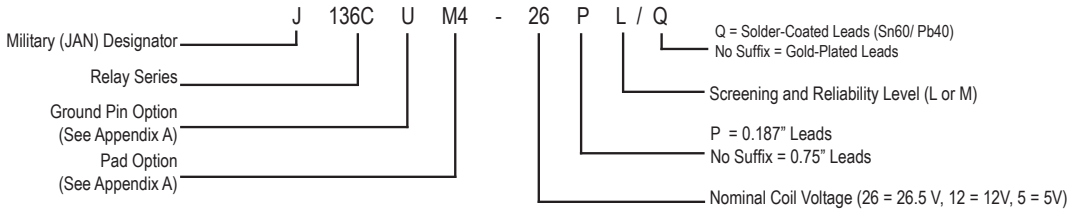


Part Numbering System (5 &6)

T²R Established Reliability Relays



Military Qualified (JAN) Relays



GENERAL ELECTRICAL SPECIFICATIONS (-65 °C to 125 °C unless otherwise noted. See notes 2 & 3.)

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 V_{dc} Inductive: 200 mA/ 28 V_{dc} (320mH) Lamp: 100 mA / 28 V_{dc} (320mH) Low level: 10 to 50 µA @ 10 to 50 mV	
Contact Load Rating (AC)		Resistive: 250 mA / 115V_{ac}, 60 and 400 Hz (Case not grounded) 100 mA / 115 V_{ac}, 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 ms max. at nominal rated coil voltage	
Release Time		7.5 ms max.	
Contact Bounce		1.5 ms max.	
Intercontact Capacitance		0.4 pf typical	
Insulation Resistance		10,000 MΩ min. between mutually isolated terminals	
Dielectric Strength (V_{rms}/60 Hz)		Atmospheric pressure: 500	70,000 ft: 125
Negative Coil Transient		1.0 V_{dc} Max.	
Diode P.I.V.		100 V_{dc} Min.	
Zener Voltage	**Min.**	17 V_{dc}	
	Max.	23 V_{dc}	
Zener Leakage Current (µA at 15.2 V_{dc}) (max.)		2.5 µA	
Power FET Characteristics (-65°C to +125°C) (V_{dc}, Max.)	**Turn Off Gate Voltage**	0.5	
	Turn On Gate Voltage	3.8 (Note 4)	
	Drain-Source Voltage	55	

DETAILED ELECTRICAL SPECIFICATIONS (-65 °C to 125 °C unless otherwise noted. See note 3.)

BASE PART NUMBERS (136C)		136C-5	136C-12	136C-26
Coil Voltage (V_{dc})	Nom.	5.0	12.0	26.5
	Max.	5.6	16.0	32.0
Coil Curent (mA_{dc}@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 (V_{dc}, Max) (Note 4)		4.0	9.8	19.5
Gate Pick-up Voltage (V_{dc}) (Note 4)	Min.	0.13	0.36	0.72
	Max.	2.3	6.5	13.0

PERFORMANCE CURVES (Note 2)

TYPICAL RF PERFORMANCE

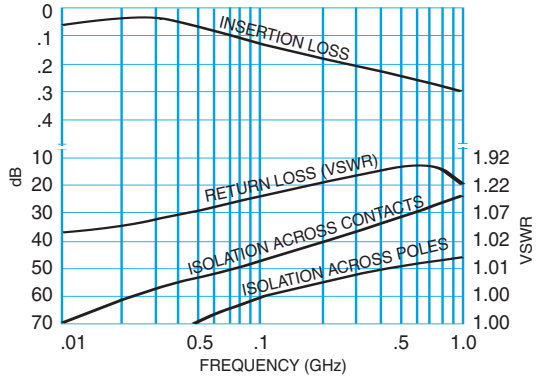


FIGURE 1

TYPICAL DC CONTACT RATING (RESISTIVE)

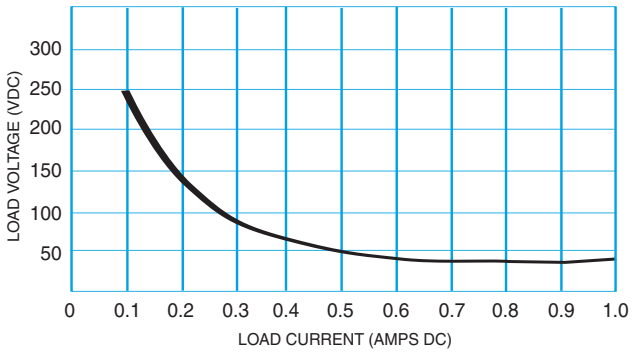


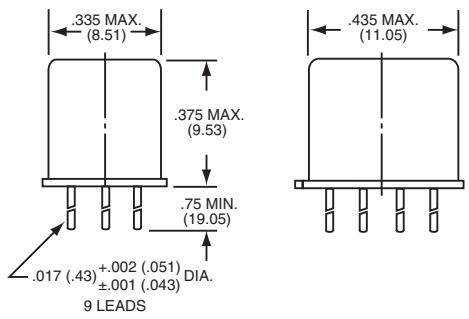
FIGURE 2

NOTES:

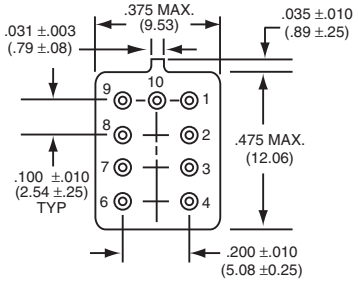
1. Relay contacts will exhibit no chatter in excess of 10 µs or transfer in excess of 1 µs.
2. “Typical” characteristics are based on available data and are best estimates. No on-going verification tests are performed.
3. Unless otherwise specified, parameters are initial values.
4. Maximum rated gate voltage = 15 V_{dc}.
5. Unless otherwise specified, relays will be supplied with Gold-plated Leads.
6. The slash and character appearing after the slash are not marked on the relay.

SERIES 136C
OUTLINE DIMENSIONS

CASE DETAIL

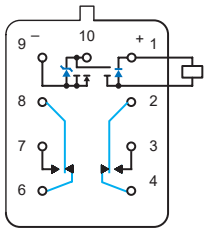


Dimensions: in. (mm)



(Viewed From Terminals)

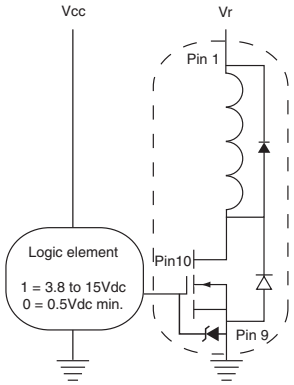
SCHEMATIC DIAGRAMS



136C

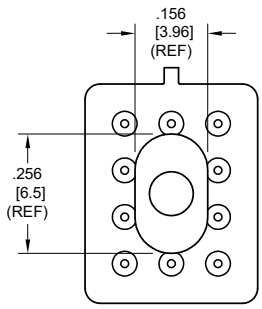
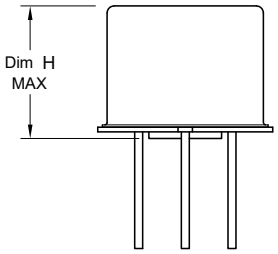
PIN 1: + Supply
PIN 9: - Supply
PIN 10: GATE

TYPICAL CMOS INTERFACE CIRCUIT
DC Logic Voltage Supply



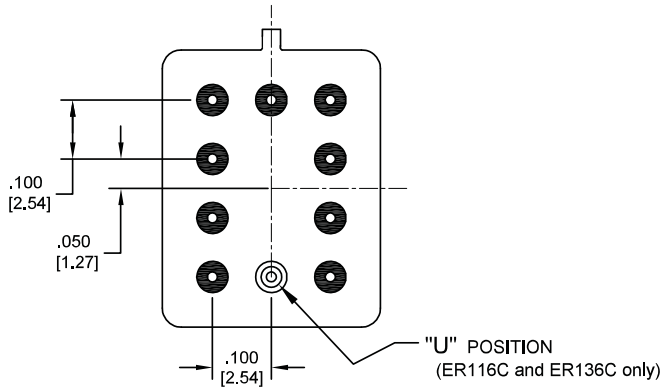
Notes:
Logic 1 activates the relay.
Logic 0 de-activates the relay.
Vcc = logic bias power.
Vr = coil energization voltage.

APPENDIX A : Spacer Pads

Pad designation and bottom view dimensions	Height	For use with the following:	Dim. H Max.
 "M9"Spacer 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 a "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.

APPENDIX A : Ground Pin Positions



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

○ 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.