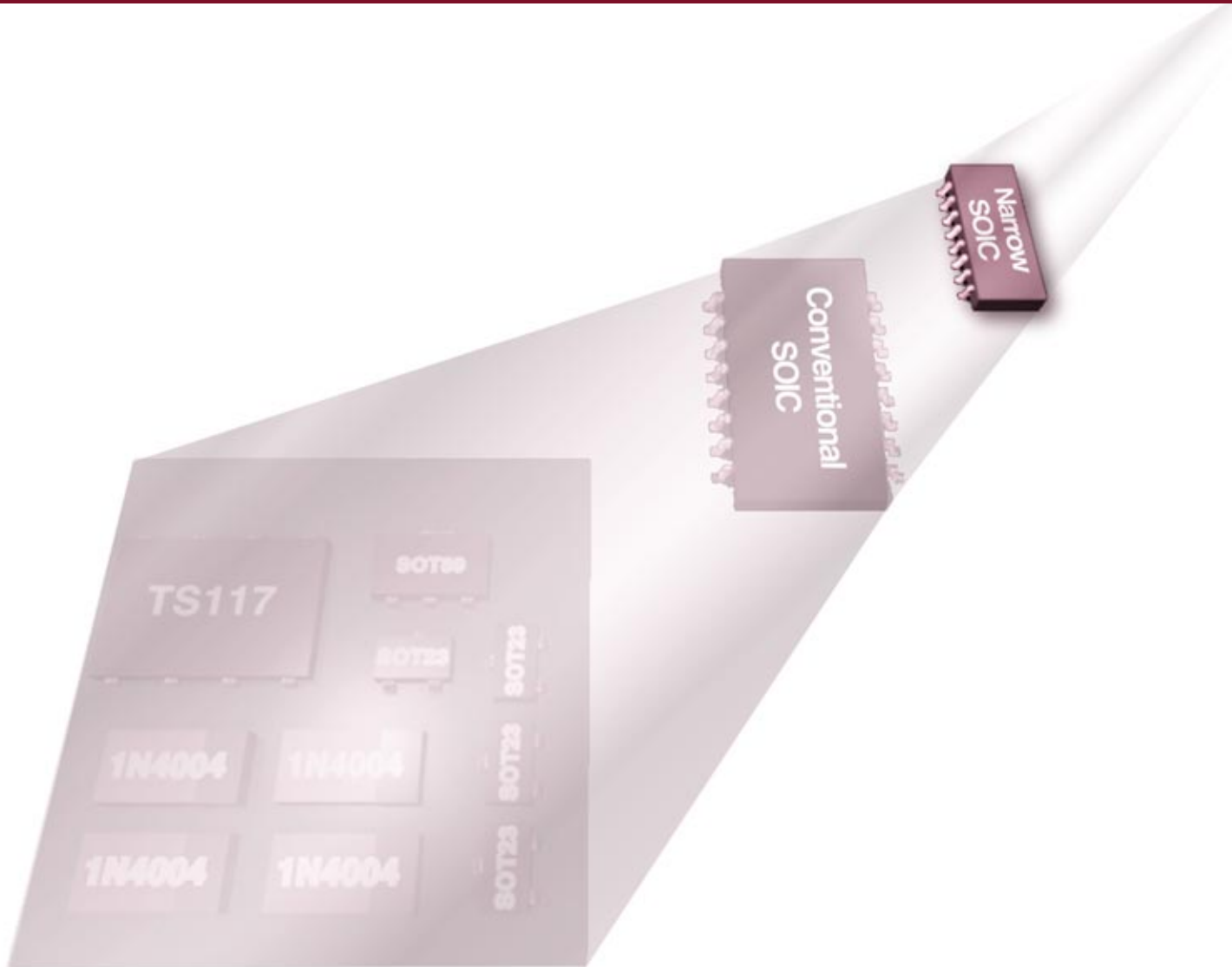


New!

PRODUCT INFORMATION

Narrow SOIC

TS112N / IAD112N / ITC135N / LOC210N / LOC211N



**Not Just Narrow SOICs
... Low Profile,
and Highly Integrated Product**

CP Clare
CORPORATION

SOIC Narrow Package

Reduces Package Width 40% Over Conventional SOIC Packages

CP Clare Corporation has taken advantage of new, innovative, packaging technology to introduce some of our most popular products in a new SOIC Narrow package. The new SOIC Narrow package features our Over/Under architecture, which reduces package width by 40% over conventional SOIC packages.

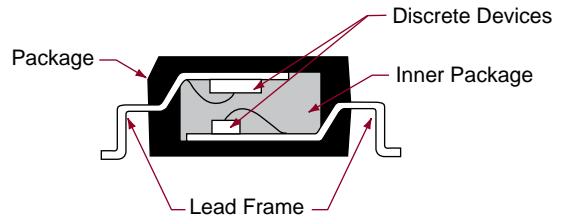
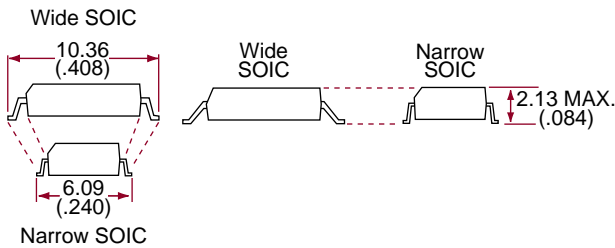
These new SOIC Narrow device packages are ideal for designs where PCB space savings are critical, such as PCMCIA applications. By initially introducing some of our most highly integrated products in this new package,

designers can take advantage of this significant space savings with proven products in switching applications in the Data Communications, Telecommunications, Security, Metering, Instrumentation, Aerospace, and Industrial Control Industries.

The specifications for each of these products in the new SOIC Narrow package are provided on the following pages. For samples, please contact your local CP Clare Sales Representative.

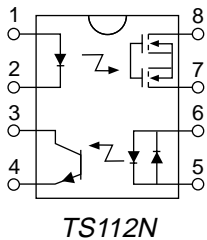
A New Narrow Width Provides:

The Same Low Profile Utilizing CP Clare's Innovative Over/Under Architecture...

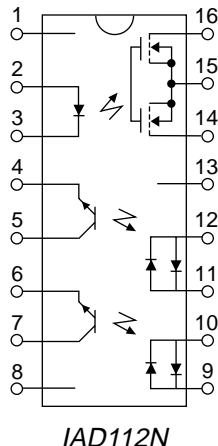


...and the Same High Levels of Product Integration

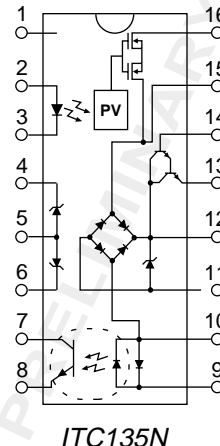
Multi-Function Relay



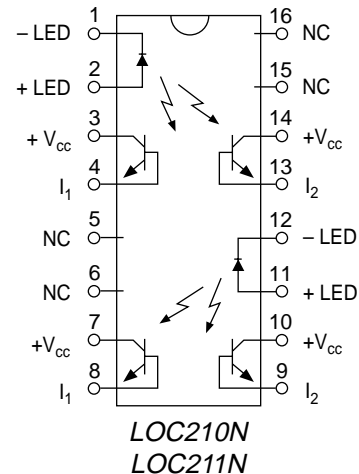
SSR w/Dual Optocoupler



SSR w/Optocoupler, Full-Wave Bridge Rectifier, & Darlington



Linear Optocoupler



TS112N / IAD112N / ITC135N*

Multifunction Solid State Integrated Switches

DESCRIPTION



CP Clare's TS112N/IAD112N/ITC135N integrated switches provide optimal function density for tip/ring interface circuits. The TS112N incorporates a 1-Form-A solid state relay and a bidirectional optocoupler. The IAD112N incorporates a 1-Form-A relay and two (2) bidirectional optocouplers. The ITC135N incorporates a 1-Form-A solid state relay, a full-wave bridge rectifier, Darlington transistor, optocoupler current detector, and three (3) Zener diodes for transient protection. Aside from the obvious advantage of board space savings, these devices offer significant cost savings by eliminating many discrete components. Input/output isolation is 1500V_{RMS}.

FEATURES

- AC/DC Switching
- 1500V_{RMS} I/O Isolation
- Optically Isolated I/O
- Two Current Detectors
- One Optocoupled Relay
- Bidirectional Current Sensing
- Bidirectional Current Switching
- FCC Compatible
- No EMI/RFI Generation
- Machine Insertable
- Wave Solderable
- One Current Detector
- Full-Wave Bridge Rectifier
- Darlington Transistor
- Three Zener Diodes

APPLICATIONS

- Telecom Switching
- Tip/Ring Circuits
- Modem Switching
 - Laptop
 - Pocket Size
 - Notebook
 - PCMCIA
- Hookswitch
- Dial Pulsing
- Ground Start
- Ringer Injection
- Loop Detect
- Ring Detect
- Data/Fax Modem
- Voicemail Systems
- Telephone Handsets
- Computer Telephone Integration
- Cable TV Modems

RATINGS (@ 25°C)

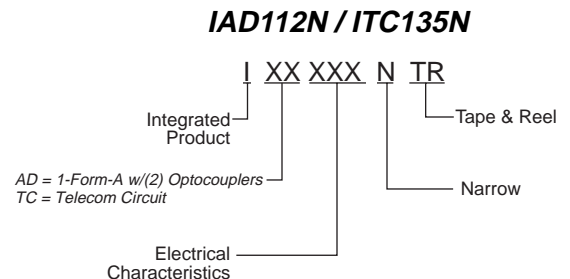
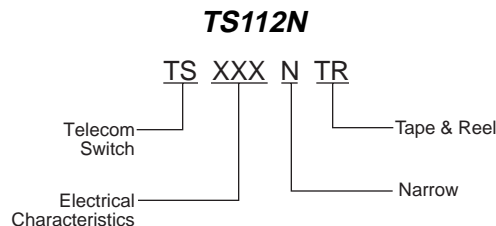
Parameter	Min	Typ	Max	Units
Input Power Dissipation	-	-	150 ¹	mW
Input Control Current Peak (10ms)	-	-	50	mA
Reverse Input Voltage	-	-	5	V
Total Power Dissipation	-	-	800 ²	mW
Capacitance Input to Output	-	3	-	pF
Isolation Voltage Input to Output	1500	-	-	V _{RMS}
Operational Temperature	-40	-	+85	°C
Storage Temperature	-40	-	+125	°C
Soldering Temperature (10 Seconds Max.)	-	-	+220	°C

¹ Derate Linearly 1.33 mW/°C
² Derate Linearly 1.67 mW/°C
 * Specification still in preliminary stage

APPROVALS

- UL Pending
- C-UL Pending

ORDERING INFORMATION



Specifications

PARAMETERS	CONDITIONS	SYMBOL	TS112N			IAD112N			ITC135N			UNITS
			MIN	TYP	MAX	MIN	TYP	MAX	MIN	TYP	MAX	
Relay Portion Output Characteristics @ 25°C												
Load Voltage, DC or Peak AC	-	V_L	-	-	350	-	-	350	-	-	350	V
Load Current (Continuous)	-	I_L	-	-	120	-	-	120	-	-	120	mA
Peak Load Current	10ms	I_{LPK}	-	-	350	-	-	350	-	-	350	mA
On-Resistance	$I_L=120mA$	R_{ON}	-	-	20	-	-	20	-	-	15	Ω
Off-State Leakage Current	$V_L=350, T_J=25^\circ C$	I_{LEAK}	-	-	1	-	-	1	-	-	1	μA
Switching Speeds												
Turn-On	$I_F=5mA, V_L=10V$	T_{ON}	-	-	3	-	-	3	-	-	3	ms
Turn-Off	$I_F=5mA, V_L=10V$	T_{OFF}	-	-	3	-	-	3	-	-	3	ms
Output Capacitance	50V, f=1MHz	C_{OUT}	-	25	-	-	25	-	-	25	-	pF
Relay Portion Input Characteristics @ 25°C												
Input Control Current	$I_L=120mA$	I_F	5	-	50	5	-	50	5	-	50	mA
Input Dropout Current	-	I_F	0.4	0.7	-	0.4	0.7	-	0.4	0.7	-	mA
Input Voltage Drop	$I_F=5mA$	V_F	0.9	1.2	1.4	0.9	1.2	1.4	0.9	1.2	1.4	V
Reverse Input Voltage	-	V_R	-	-	5	-	-	5	-	-	5	V
Reverse Input Current	$V_R=5V$	I_R	-	-	10	-	-	10	-	-	10	μA
Detector Portion Output Characteristics @ 25°C												
Phototransistor Blocking Voltage	$I_C=10\mu A$	BV_{CEO}	20	50	-	20	50	-	20	50	-	V
Phototransistor Dark Current	$V_{CE}=5V, I_F=0mA$	I_{CEO}	-	50	500	-	50	500	-	50	500	nA
Saturation Voltage	$I_C=2mA, I_F=16mA$	V_{SAT}	-	0.3	0.5	-	0.3	0.5	-	0.3	0.5	V
Current Transfer Ratio	$I_F=6mA, V_{CE}=0.5V$	CTR	33	200	-	33	200	-	33	200	-	%
Detector Portion Input Characteristics @ 25°C												
Input Control Current	$I_C=2mA, V_{CE}=0.5V$	I_F	6	2	100	6	2	100	6	2	100	mA
Input Voltage Drop	$I_F=5mA$	V_F	0.9	1.2	1.4	0.9	1.2	1.4	0.9	1.2	1.4	V
Input Current (Detector must be off)	$I_C=1\mu A, V_{CE}=5V$	I_F	5	25	-	5	25	-	5	25	-	μA
Bridge Rectifier Electrical Ratings @ 25°C												
Reverse Voltage	-	V_{RD}	-	-	-	-	-	-	-	-	100	V
Forward Drop Voltage	$I_{FD}=120mA$	V_{FD}	-	-	-	-	-	-	-	-	1.5	V
Reverse Leakage Current	$T_J=25^\circ C, V_R=100V$ $T_J=85^\circ C$	I_{RD}	-	-	-	-	-	-	-	-	10	μA
Forward Current (Continuous)	-	I_{FD}	-	-	-	-	-	-	-	-	140	mA
Forward Current (Peak)	t=10ms	I_{FD}	-	-	-	-	-	-	-	-	0.5	A

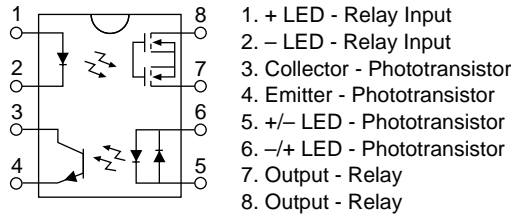
Specifications

PARAMETERS	CONDITIONS	SYMBOL	TS112N			IAD112N			ITC135N			UNITS
			MIN	TYP	MAX	MIN	TYP	MAX	MIN	TYP	MAX	
Darlington Electrical Ratings @ 25°C												
Collector-Emitter Voltage	$I_c=10\text{mA DC}, I_B=0$	V_{CE0}	-	-	-	-	-	-	40	-	-	V
Collector-Current Continuous	$V_{CE}=3.5\text{V}$	I_C	-	-	-	-	-	-	-	-	120	mA
Power Dissipation @ 25°C	-	P_d	-	-	-	-	-	-	-	-	500	mW
Off-State Collector Emitter Leakage Current	$V_{CE}=10\text{V}; I_B=0\text{mA}$	I_{CEX}	-	-	-	-	-	-	-	-	1	μA
DC Current Gain	$I_C=120\text{mA}, V_{CE}=10\text{VDC}$	h_{FE}	-	-	-	-	-	-	10,000	-	-	-
Saturation Voltage	$I_C=120\text{mA}$	$V_{CE(SAT)}$	-	-	-	-	-	-	-	-	1.5	V
Total Harmonic Distortion	$f_o=300\text{Hz @ -10dBm}$ $I_C=40\text{mA}$	-	-	-	-	-	-	-	-	-	-80	dB
Zener Characteristics @ 25°C												
Zener Voltage	$I_{ZT}=20\text{mA}; \text{Pins 4-5, 6-5}$ $I_{ZT}=20\text{mA}; \text{Pins 12-11}$	V_Z V_Z	-	-	-	-	-	-	-	4.3	-	V
			-	-	-	-	-	-	-	15	-	V
Input to Output Capacitance	-	$C_{I/O}$	-	3	-	-	3	-	-	3	-	PF
Input to Output Isolation	-	$V_{I/O}$	1500	-	-	1500	-	-	1500	-	-	V_{RMS}

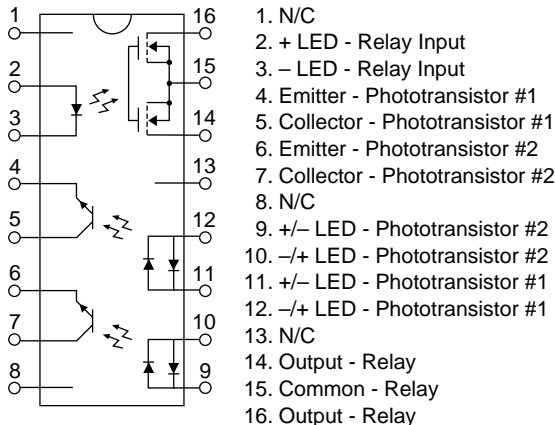
Note: Please refer to the performance curves in the 1997 CP Clare Databook: ITC135P — pages 270-272

PACKAGE PINOUT

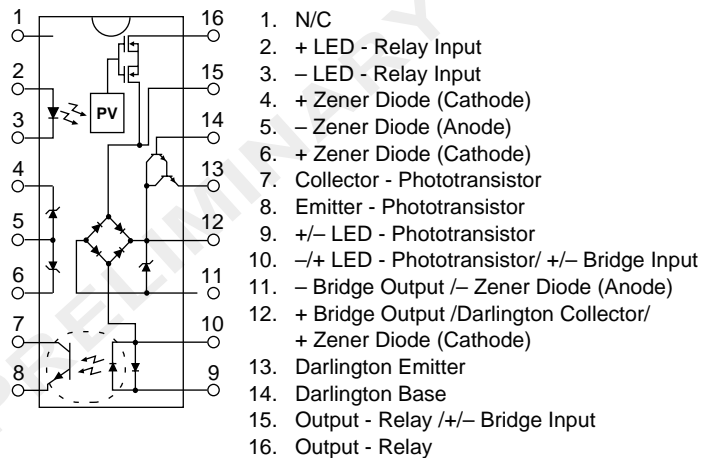
TS112N



IAD112N

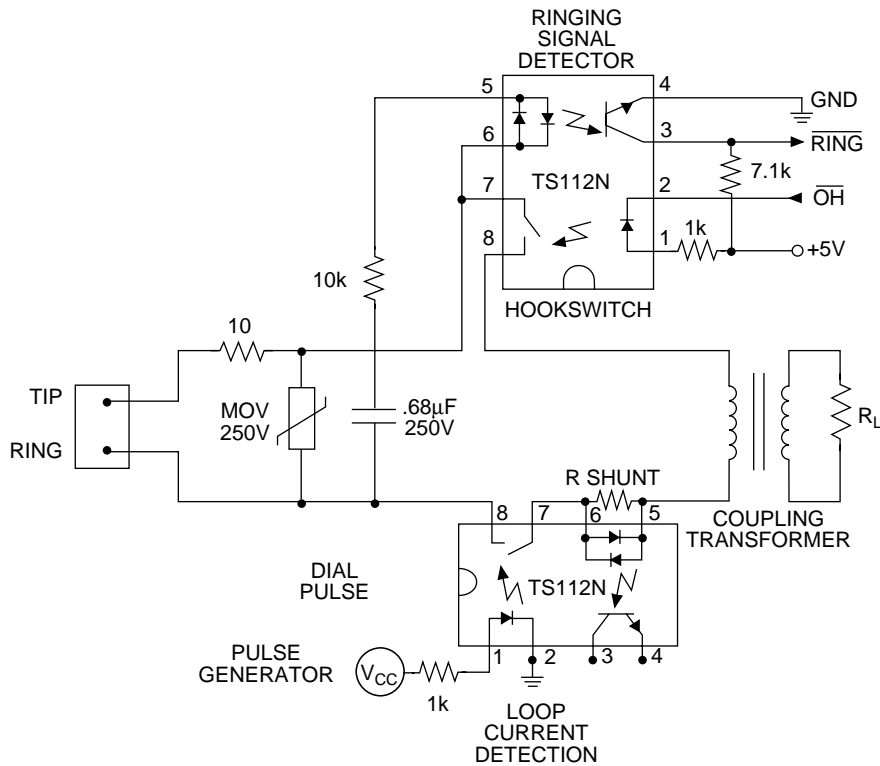


ITC135N



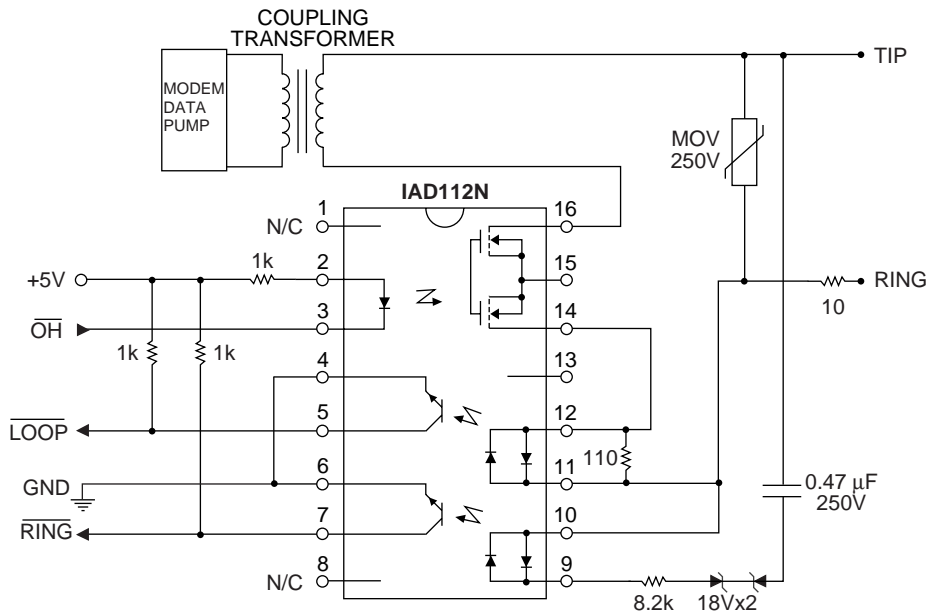
EXAMPLE CIRCUIT

TS112N

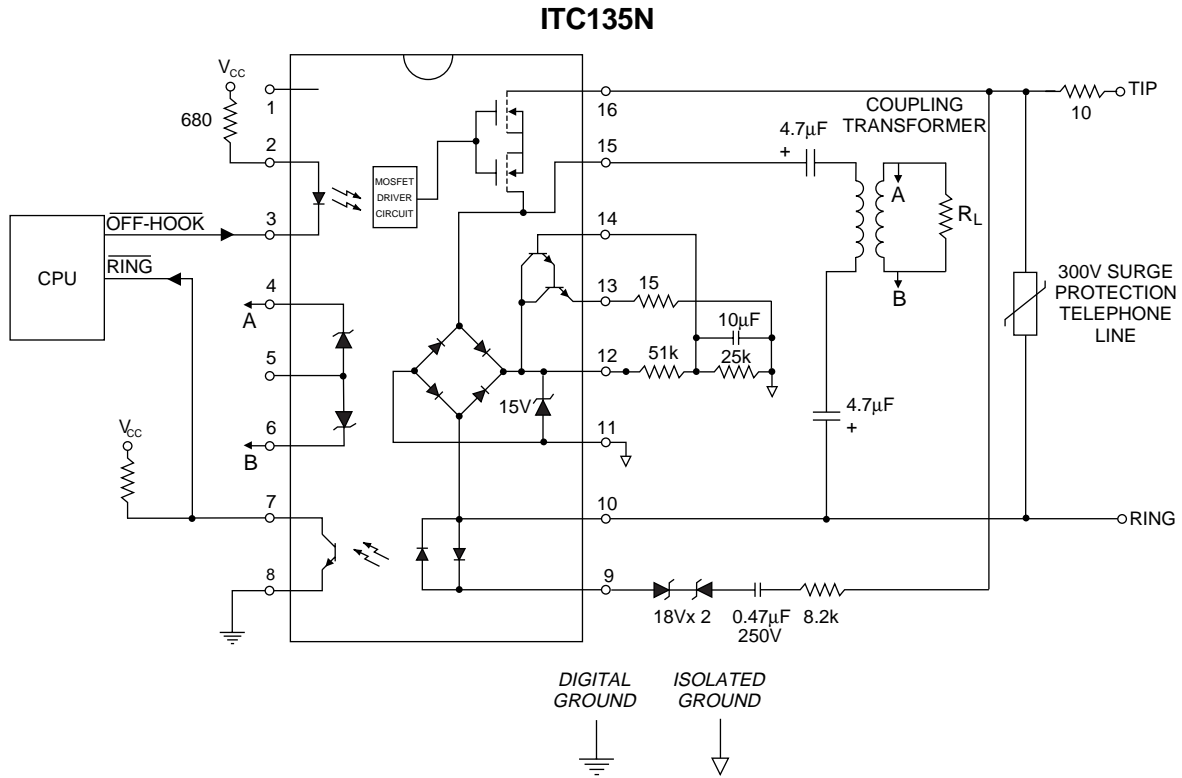


TYPICAL DATA ACCESS ARRANGEMENT (DAA)

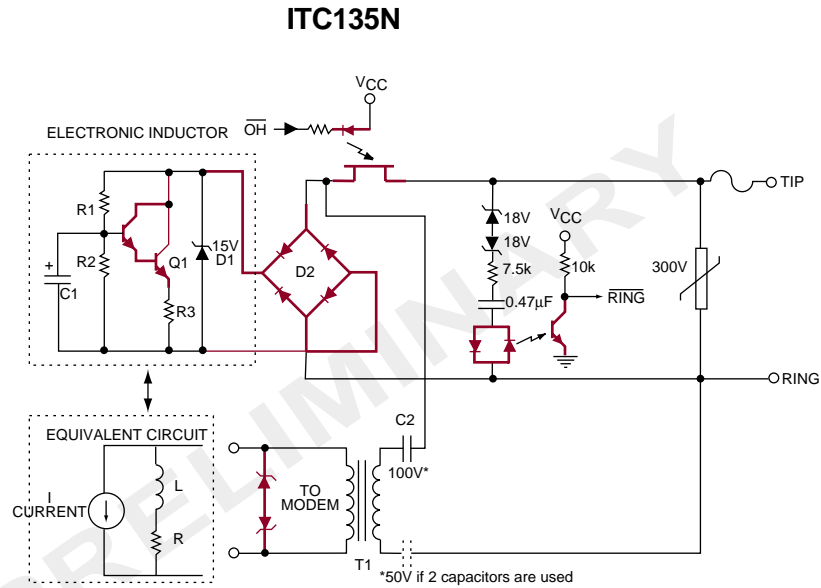
IAD112N



EXAMPLE CIRCUIT



APPLICATION CIRCUIT



Note: Red lines represent ITC Circuitry

LOC210N / LOC211N

Linear Optocouplers

DESCRIPTION



CP Clare's LOC210N and LOC211N each provide two independent linear optocouplers. Each optocoupler in the dual LOC210N and LOC211N packages feature an infrared LED optically coupled with two phototransistors. One input phototransistor is used to generate the servo control signal that compensates for the non-linear time and temperature characteristics of the LED. The second phototransistor provides an output signal that is linear with respect to the servo LED current. The compensated optocouplers achieve a better than 0.01% servo linearity and greater than 200kHz bandwidth. The LOC210N and LOC211N dual optocouplers provide better than 87dB THD and 1500V_{RMS} input/output isolation.

FEATURES

- Couples Analog & Digital Signals
- Wide Bandwidth (>200kHz)
- High Gain Stability
- THD 87dB Typical
- 0.01% Servo Linearity
- 1500V_{RMS} I/O Isolation
- Machine Insertable
- Wave Solderable

APPLICATIONS

- Modem Transformer Replacement With No Insertion Loss
- Digital Telephone Isolation
- Power Supply Feedback Voltage/Current
- Medical Sensor Isolation
- Audio Signal Interfacing
- Isolation of Process Control Transducers

RATINGS (@ 25°C)

Parameter	Min	Typ	Max	Units
Input Power Dissipation	-	-	150 ¹	mW
Input Control Current Peak (10ms)	-	-	100	mA
	-	-	1	A
Total Package Dissipation	-	-	800 ²	mW
Isolation Voltage Input to Output	1500	-	-	V _{RMS}
Operational Temperature	-40	-	+85	°C
Storage Temperature	-40	-	+125	°C
Soldering Temperature (10 Seconds Max)	-	-	+220	°C

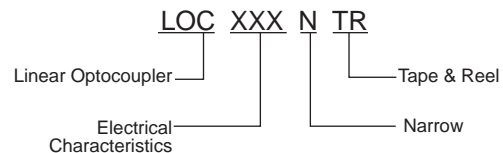
¹ Derate Linearly 1.33 mW/°C

² Derate Linearly 1.67 mW/°C

APPROVALS

- UL Pending
- C-UL Pending
- BSI Pending

ORDERING INFORMATION



Specifications

LOC210N

LOC211N

PARAMETERS	CONDITIONS	SYMBOL	MIN	TYP	MAX	MIN	TYP	MAX	UNITS
Input Characteristics @ 25°C¹									
LED Voltage Drop	$I_F=2-10mA$	V_F	0.9	1.2	1.4	0.9	1.2	1.4	V
Reverse LED Current	$V_R=5V$	I_R	-	-	10	-	-	10	μA
Reverse LED Voltage	-	V_R	-	-	5	-	-	5	V
Forward LED Current	-	I_F	-	-	100	-	-	100	mA
Coupler/Detector Characteristics @ 25°C¹									
Dark Current	$I_F=0mA, V_{CC}=15V$	I_D	-	1	25	-	1	25	nA
K1, Servo Gain (I_1/I_F)	$I_F=2-10mA, V_{CC}=15V$	K1	0.004	0.007	0.030	0.008	-	0.030	-
K2, Forward Gain (I_2/I_F)	$I_F=2-10mA, V_{CC}=15V$	K2	0.004	0.007	0.030	0.006	-	0.030	-
K3, Transfer Gain (K_2/K_1)	$I_F=2-10mA, V_{CC}=15V$	K3	0.733	-	1.072	0.733	-	1.072	-
ΔK3, Transfer Gain Linearity (non-servoed)	$I_F=2-10mA$	ΔK3	-	-	1.0	-	-	1.0	%
K3 Temperature Coefficient	$I_F=2-10mA, V_{det}=-5V$	ΔK3/ΔT	-	0.005	-	-	0.005	-	%/°C
Common Mode Rejection Ratio	$V=20V_{P-P}, R_L=2KΩ, F=100Hz$	CMRR	-	130	-	-	130	-	dB
Total Harmonic Distortion	$F_0=350Hz, 0dBm$	THD	-96	-87	-80	-96	-87	-80	dB
Frequency Response	Photoconductive Operation	BW(-3dB)	-	200	-	-	200	-	kHz
	Photovoltaic Operation	BW(-3dB)	-	40	-	-	40	-	kHz
Input to Output Capacitance	-	$C_{I/O}$	-	3	-	-	3	-	pF
Input to Output Isolation	-	$V_{I/O}$	1500	-	-	1500	-	-	V_{RMS}

¹ All parameters above are for each optocoupler.

PART NUMBER INFORMATION

The LOC210N and LOC211N are shipped in antistatic tubes (50 pieces each) or tape/reel (1,000 pieces each). Each container has only one bin combination which will be

branded on each part with the appropriate bin letter K, L, M, or N in the lower right hand corner. Suffix representation is described in the "Bin Matrix."

Example:



K3 Sorted Bins

Bin 1 = 0.773 - 0.886

Bin 2 = 0.887 - 1.072

Bin Matrix

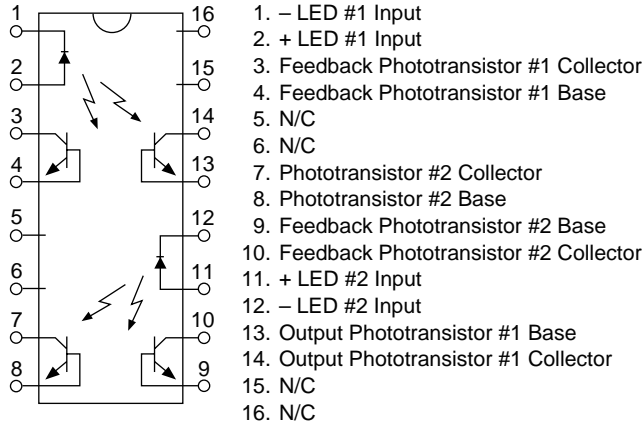
Suffix	Bin	
	Top pole Optocoupler*	Bottom Pole Optocoupler**
K	1	1
L	1	2
M	2	1
N	2	2

* Top Pole Optocoupler: Pins 1, 2, 3, 4, 13, and 14.

** Bottom Pole Optocoupler: Pins 7 through 12.

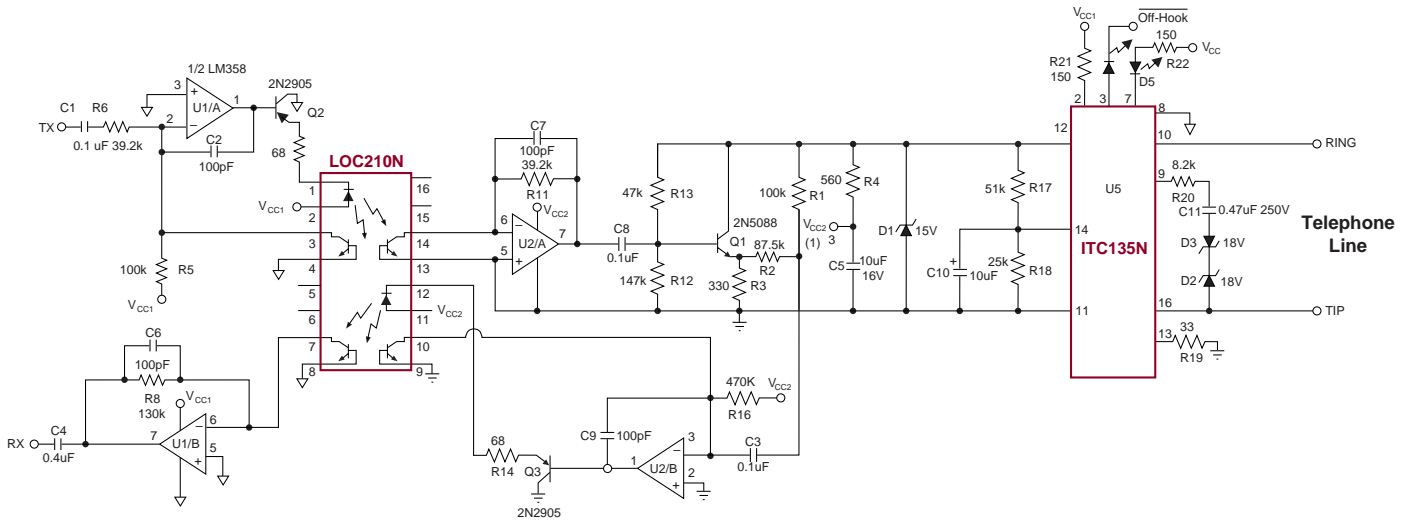
PACKAGE PINOUT

LOC210N/LOC211N



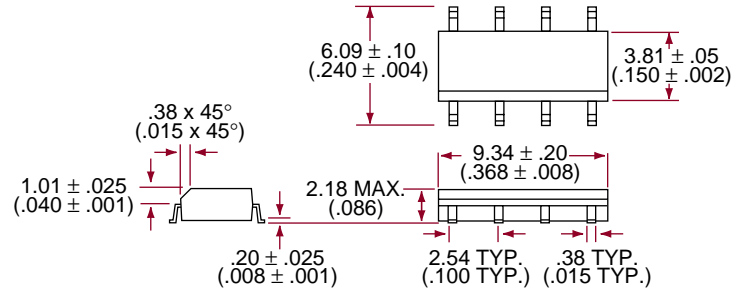
EXAMPLE CIRCUIT

LOC210N AND ITC135N OPTICALLY COUPLED DAA



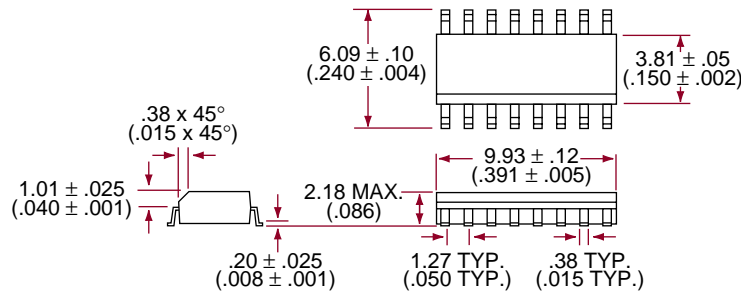
MECHANICAL DIMENSIONS

8 PIN SOIC NARROW

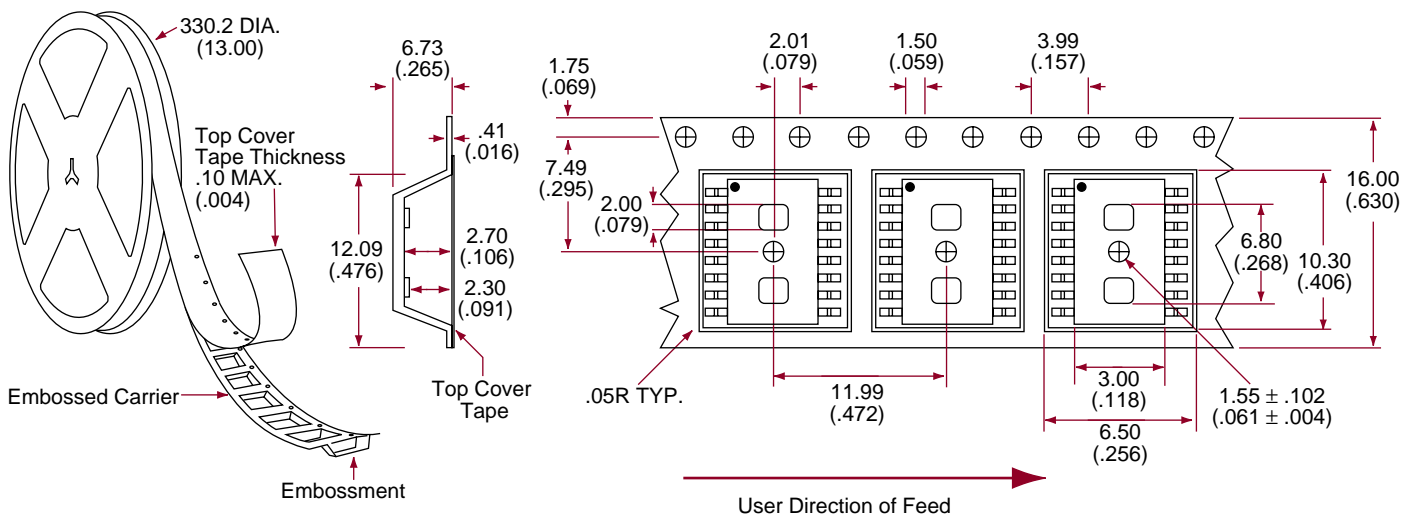


DIMENSIONS
mm
(Inches)

16 PIN SOIC NARROW



TAPE AND REEL PACKAGING FOR 8 AND 16 PIN NARROW SOIC PACKAGE



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<http://www.cpclare.com>

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