



Self-Test Ground Fault
Circuit Interrupter (GFCI)

NCS37021

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Table 2. ABSOLUTE MAXIMUM RATINGS (Notes 1, 2)

Rating	Symbol	Value	Unit
Supply Voltage Range			

A, MLD input = 60 Hz, Refer to Figure 2)

	Min	Typ	Max	Unit
	140		95	°C
	11		13	V
			10	mA
		1.3		mA
		160		mV
			4	mA
		3.3		V
		3.3		V
		1.65		V
		±125		V
			135	ms
			70	ms
			20	ms
		1.95		V
	2	4.75	7	kHz
		50		ms
		25		MHz
1%	80	87	95	Vrms
			400	A
				A
		50		k
	16			ms
		1		s
		1		min
		12		

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APPLICATIONS INFORMATION

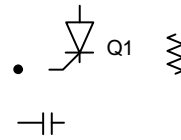
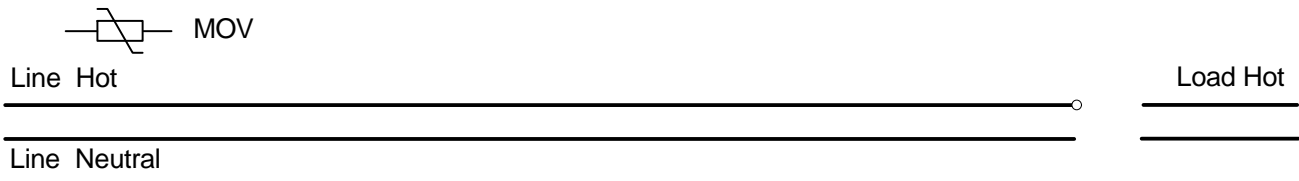


Figure 2. GFCI Receptacle Application Diagram

Table 5. RECOMMENDED EXTERNAL COMPONENTS

Component Type	Instance	Value	Note
SCR	Q1, Q2	ī	
NPN	Q3	ī	MMBT6517LT1 īD
Diode Bridge	DB	ī	
Diode	D1, D2, D3, D4, D5	ī	
LED	D6	ī	LED for self ītest failure
Capacitor	C1	1 F	SUP pin holding capacitor
Capacitor	C2A, C2B	1 F	Internal 3.3 V and 1.8 V reference filter cap
Capacitor	C3	10 nF	SCR gate filter capacitor
Capacitor	C4	56 nF	Anti īaliasing filter (1 kHz corner frequency)
Capacitor	C5	1 nF	High frequency filter
Capacitor	C6	33 nF	Differential current filter capacitor
Capacitor	C7	1 nF	CTB bias filter
Capacitor	C8	10 nF	Ground Neutral CT resonance capacitor
Capacitor	C9	120 pF	Ground Neutral CT AC coupler
Capacitor	C10	100 pF	Ground noise filter
Resistor	R1A, R1B, R1C, R1D	25 k	Current limit resistors
Resistor	R2	1 M	MLD current limit/under voltage attenuator
Resistor	R3	20 k	Differential filter resistor
Resistor	R4A	36 k	Precision resistor (1%), Differential burden/CT low pass filter
Resistor	R4B	50	CT low pass filter
Resistor	R5	370	Differential burden resistor, 1% tolerance
Resistor	R6	0 ī200	Sets the GN sensitivity
Resistor	R7, R13	4.7 k	Sets the SCR gate current
Resistor	R8	15 k	Controls the self ītest current in the Q3
Resistor	R9	3.3 k	LED current limiter resistor
Resistor	R10	10 k	Sets the current in the base of Q3
Resistor	R11	10 k	SCR gate discharge current
Resistor	R12	ī	Current limit resistor for SCM
Inductor	L1, L2	1 k @ 100 MHz	CIM05U102, CT RF filter
Current Transformer	CT1	1000	Differential current transformer
Current Transformer	CT2	250	GN current transformer

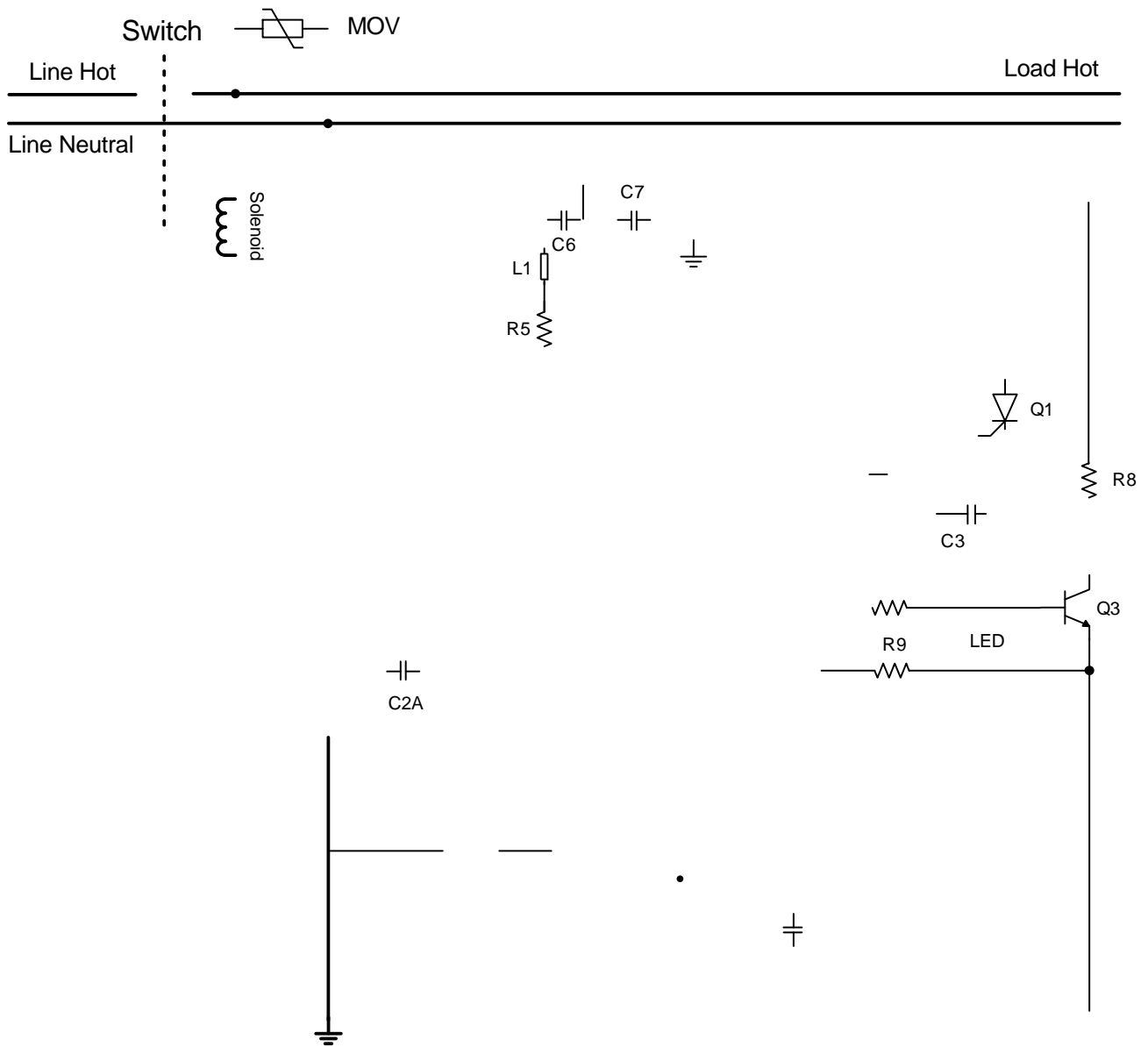


Figure 3. Circuit Breaker Application Diagram (Half Bridge Supply)

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WAVEFORMS

Ch1: SCM, Ch2: SCR, Ch3: MLD, Ch4: GFT

Ch1: CTG Ch2: SCR, Ch3: MLD, Ch4: REF

Figure 4. Self Test

Figure 5. Grounded Neutral Fault Detection

Ch1: IDF Ch2: SCR, Ch3: MLD, Ch4: REF

Ch1: SCM Ch2: SCR, Ch3: MLD, Ch4: PTT

Figure 6. Ground Fault Detection

Figure 7. PTT Self Test

ORDERING INFORMATION

| Device

NCS37021

PACKAGE DIMENSIONS

QFN16 3x3, 0.5P
CASE 485FQ
ISSUE B

TOP VIEW

SIDE VIEW

BOTTOM VIEW

DIM	MILLIMETERS		
	MIN.	NOM.	MAX.
A	0.80	0.90	1.00
A1	---	---	0.05
b	0.18	0.24	0.30
D			
E			
e	0.50 BSC		

RECOMMENDED
MOUNTING FOOTPRINT*

* For addi-