

DC spark-over voltage <sup>1) 2) 4)</sup>	230 ± 20	V %
Impulse spark-over voltage <sup>4)</sup> at 100 V/μs - for 99 % of measured values - typical values of distribution	< 450 < 400	V V
at 1 kV/μs - for 99 % of measured values - typical values of distribution	< 650 < 600	V V
Nominal impulse discharge current (wave 8/20 μs) <sup>5)</sup>	10	kA
Single impulse discharge current (wave 8/20 μs) <sup>5)</sup>	15	kA
Nominal alternating discharge current (50 Hz, 1 s) <sup>5)</sup>	10	A
Alternating discharge current (50 Hz, 9 cycles) <sup>5)</sup>	40	A
Insulation resistance at 100 V <sub>dc</sub> <sup>4)</sup>	> 10	GΩ
Capacitance at 1 MHz <sup>4)</sup>	< 1.5	pF
Transverse delay time <sup>3)</sup>	< 0.2	μs
Arc voltage at 1 A	~ 35	V
Glow to arc transition current	~ 1.0	A
Glow voltage	~ 200	V
Weight	~ 2	g
Operation and storage temperature	-40 ... +90	°C
Climatic category (IEC 60068-1)	40/ 90/ 21	
Marking, red	<b>EPCOS</b> <b>230 YY O</b> 230 - Nominal voltage YY - Year of production O - Non radioactive	

<sup>1)</sup> At delivery AQL 0.65 level II, DIN ISO 2859

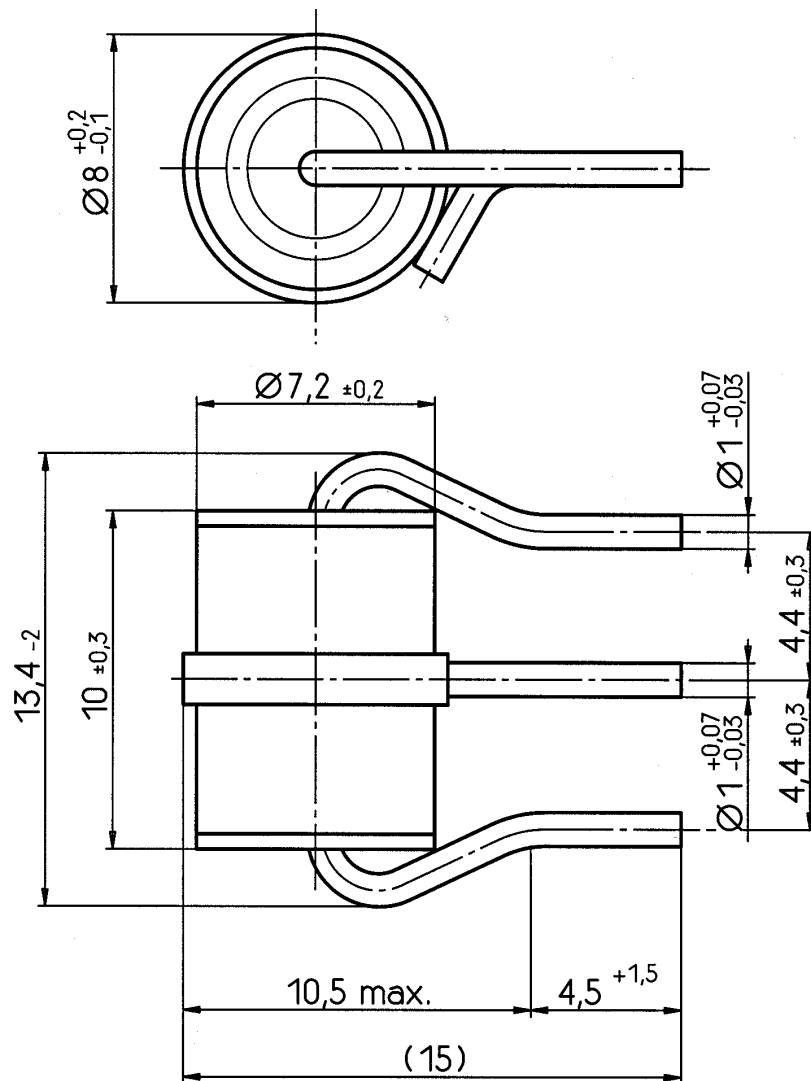
<sup>2)</sup> In ionized mode

<sup>3)</sup> Test according to ITU-T Rec. K.12

<sup>4)</sup> Tip or ring electrode to center electrode

<sup>5)</sup> Total current through center electrode, half value through tip respectively ring electrode.

Terms in accordance with ITU-T Rec. K.12 and DIN 57845/VDE0845



Not to scale

Dimensions in mm

Non controlled document

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# Complete, Isolated RS-485/RS-422 Data Interface

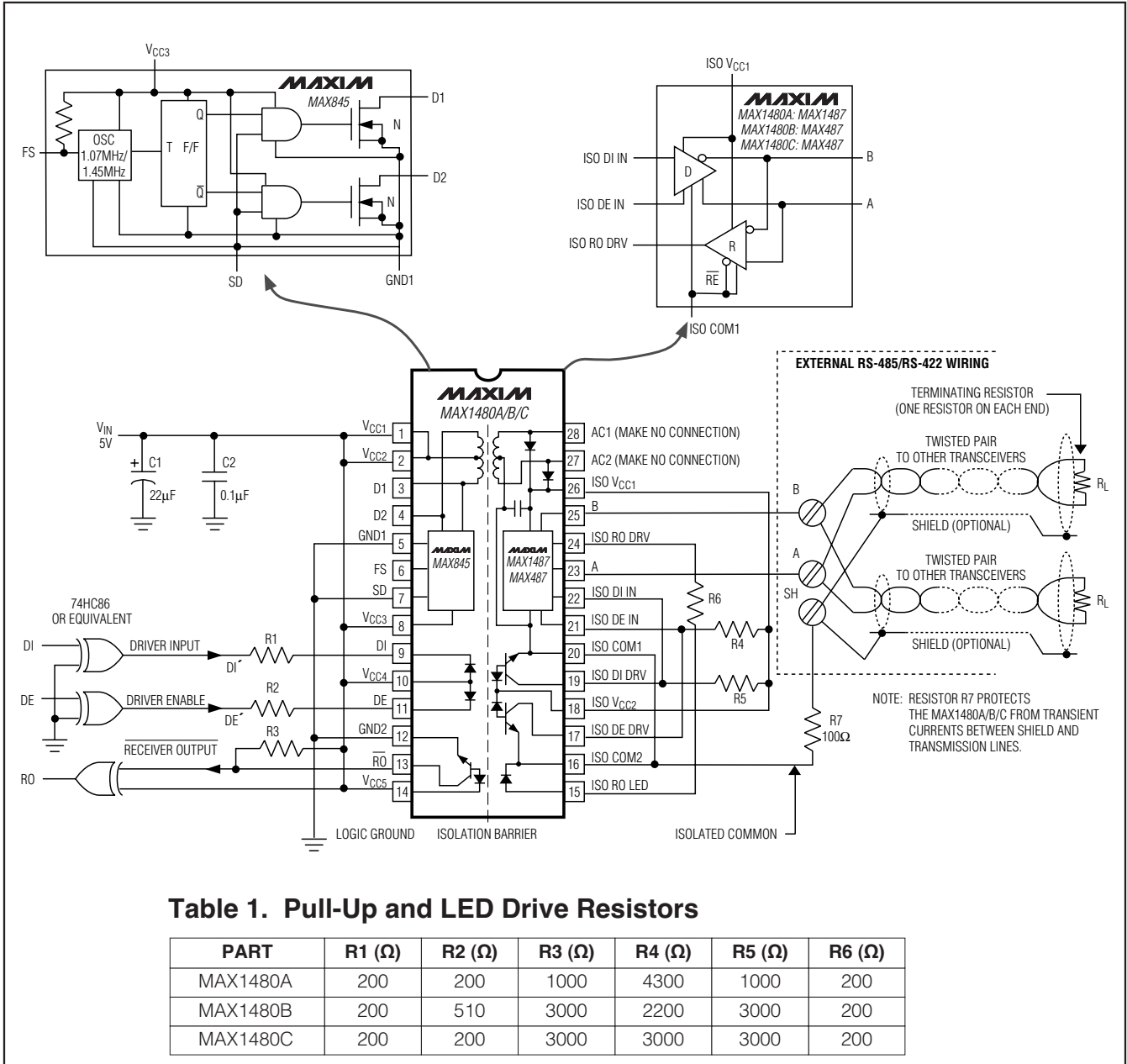


Figure 1. MAX1480A/MAX1480B/MAX1480C Detailed Block Diagram and Typical Application Circuit

The MAX1480A/MAX1480B/MAX1480C/MAX1490A/MAX1490B typically withstand 1600V<sub>RMS</sub> (1 minute) or 2000V<sub>RMS</sub> (1 second). The logic inputs can be driven from TTL/CMOS-logic with a series resistor, and the received data output can directly drive TTL or CMOS-logic families with only resistive pullup.

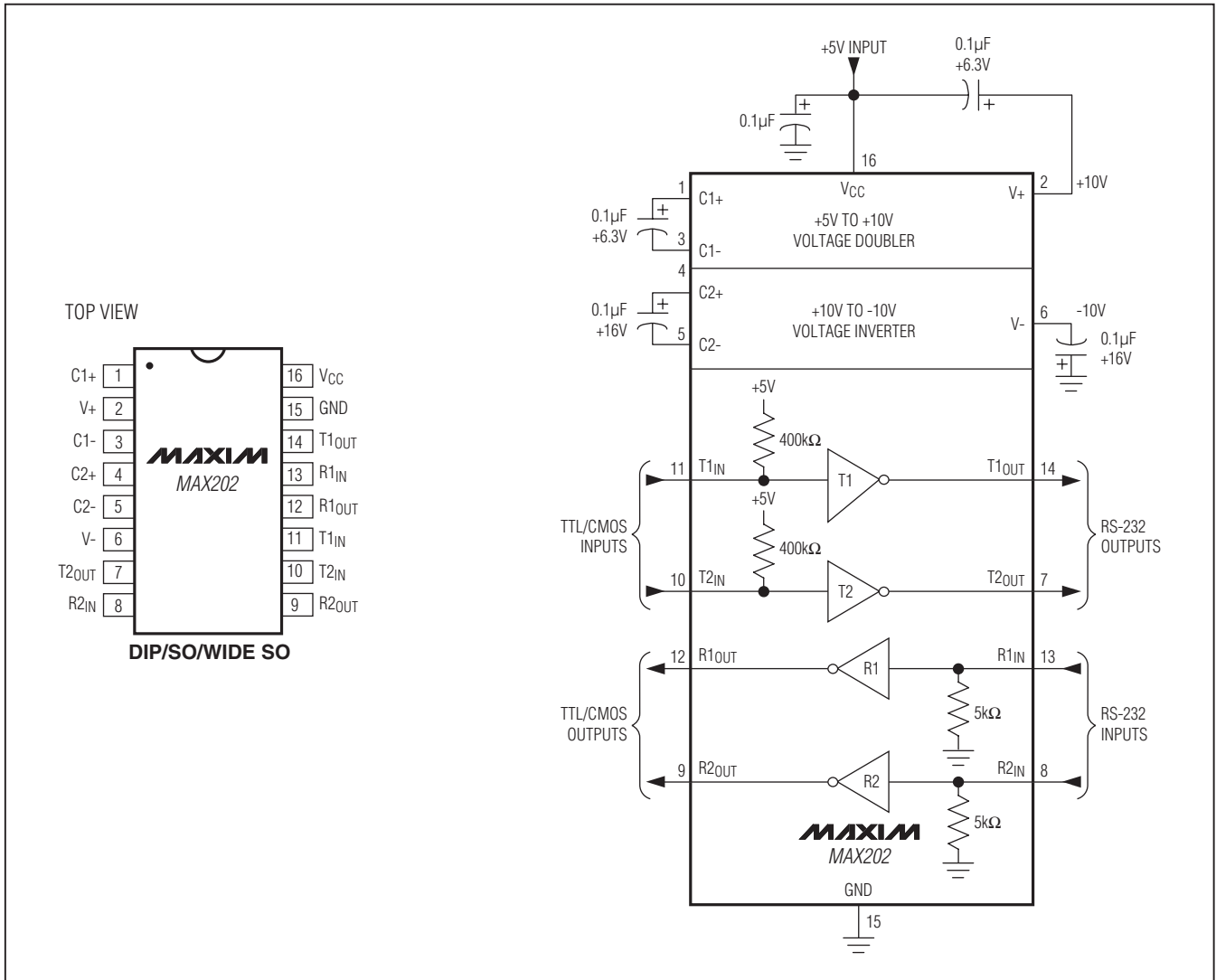
### Low-Power Shutdown Mode

The SD pin shuts down the oscillator on the internal power driver. With the primary side in shutdown, no power is transferred across the isolation barrier. The DI and DE optocouplers, however, still consume current if the drive signals on the nonisolated side are low. Therefore, leave DI' and DE' high or floating when in shutdown mode.

# +5V, RS-232 Transceivers with 0.1μF External Capacitors

## MAX202 Pin Configuration/Typical Operating Circuit

MAX200-MAX209/MAX211/MAX213

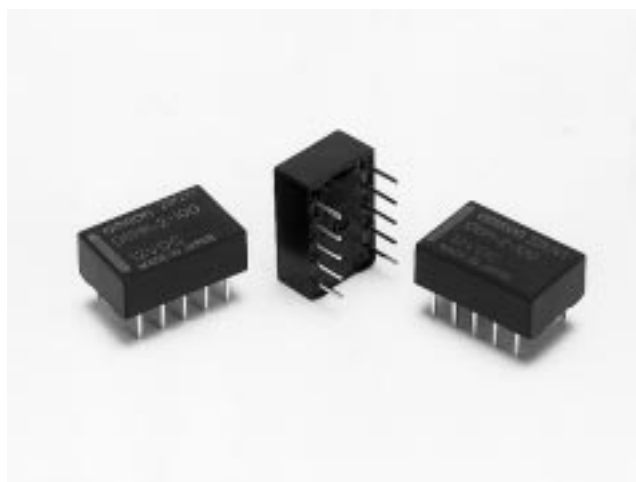


## PCB Relay

## G6H

### Ultracompact, Ultrasensitive DPDT Relay

- Compact size and low 5-mm profile.
- Low power consumption (140 mW for single-side stable, 100 to 300 mW for latching type) and high sensitivity.
- Low thermoelectromotive force.
- Low magnetic interference enables high-density mounting.
- Single- and double-winding latching types also available.



### Ordering Information

Classification		Single-side stable	Single-winding latching	Double-winding latching
DPDT	Plastic sealed	G6H-2	G6HU-2	G6HK-2
	PCB terminal	G6H-2F	---	---

**Note:** When ordering, add the rated coil voltage to the model number.

Example: G6HK-2 12 VDC

Rated coil voltage

#### Model Number Legend:

G6H   -     -     VDC

1      2      3      4      5

**1. Relay Function**

- None: Single-side stable
- U: Single-winding latching
- K: Double-winding latching

**2. Contact Form**

- 2: DPDT

**3. Terminal Shape**

- None: PCB terminal
- F: Surface mount terminal

**4. Classification**

- U: Ultrasonically cleanable

**5. Rated Coil Voltage**

- 3, 5, 6, 9, 12, 24 VDC

# Specifications

## ■ Coil Ratings

### Single-side Stable Type (G6H-2, G6H-2F)

Rated voltage		3 VDC	5 VDC	6 VDC	9 VDC	12 VDC	24 VDC
Rated current		46.7 mA	28.1 mA	23.3 mA	15.5 mA	11.7 mA	8.3 mA
Coil resistance		64.3 Ω	178 Ω	257 Ω	579 Ω	1,028 Ω	2,880 Ω
Coil inductance (H) (ref. value)	Armature OFF	0.025	0.065	0.11	0.24	0.43	1.2
	Armature ON	0.022	0.058	0.09	0.20	0.37	1.0
Must operate voltage	75% max. of rated voltage						
Must release voltage	10% min. of rated voltage						
Max. voltage	200% of rated voltage at 23°C, 150% at 70°C					170% of rated voltage at 23°C, 130% at 70°C	
Power consumption	Approx. 140 mW					Approx. 200 mW	

**Note:** 48 VDC (single-side stable) model is also available. Consult OMRON for details.

### Single-winding Latching Type (G6HU-2)

Rated voltage		3 VDC	5 VDC	6 VDC	9 VDC	12 VDC	24 VDC
Rated current		33.3 mA	20 mA	16.7 mA	11.1 mA	8.3 mA	6.25 mA
Coil resistance		90 Ω	250 Ω	360 Ω	810 Ω	1,440 Ω	3,840 Ω
Coil inductance (H) (ref. value)	Armature OFF	0.034	0.11	0.14	0.33	0.60	1.6
	Armature ON	0.029	0.09	0.12	0.28	0.50	1.3
Must operate voltage	75% max. of rated voltage						
Must release voltage	75% min. of rated voltage						
Max. voltage	180% of rated voltage at 23°C, 140% at 70°C						
Power consumption	Approx. 100 mW					Approx. 150 mW	

### Double-winding Latching Type (G6HK-2)

Rated voltage		3 VDC	5 VDC	6 VDC	9 VDC	12 VDC	24 VDC
Rated current		66.7 mA	40 mA	33.3 mA	22.2 mA	16.7 mA	12.5 mA
Coil resistance		45 Ω	125 Ω	180 Ω	405 Ω	720 Ω	1,920 Ω
Coil inductance (H) (ref. value)	Armature OFF	0.014	0.042	0.065	0.16	0.3	0.63
	Armature ON	0.0075	0.023	0.035	0.086	0.16	0.33
Must operate voltage	75% max. of rated voltage						
Must release voltage	75% min. of rated voltage						
Max. voltage	160% of rated voltage at 23°C, 130% at 70°C					130% of rated voltage at 23°C, 110% at 70°C	
Power consumption	Approx. 200 mW					Approx. 300 mW	

**Note:** 1. The rated current and coil resistance are measured at a coil temperature of 23°C with a tolerance of ±10%.

2. Operating characteristics are measured at a coil temperature of 23°C.

## ■ Contact Ratings

Load	Resistive load ( $\cos\phi = 1$ )
Rated load	0.5 A at 125 VAC; 1 A at 30 VDC
Contact material	Ag (Au-clad)
Rated carry current	1 A
Max. switching voltage	125 VAC, 110 VDC
Max. switching current	1 A
Max. switching capacity	62.5 VA, 33 W
Min. permissible load	10 μA at 10 mVDC

**Note:** P level:  $\lambda_{60} = 0.1 \times 10^{-6}$ /operation

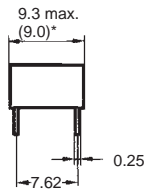
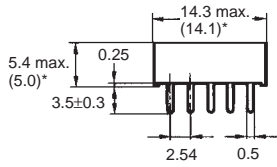
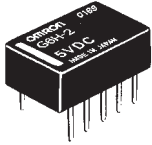
# Dimensions

**Note:** 1. All units are in millimeters unless otherwise indicated.

2. Orientation marks are indicated as follows:

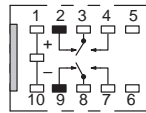
## Single-side Stable Type

### G6H-2(-U)



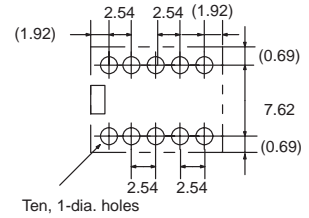
\* Average value

## Terminal Arrangement/ Internal Connections (Bottom View)



## Mounting Holes (Bottom View)

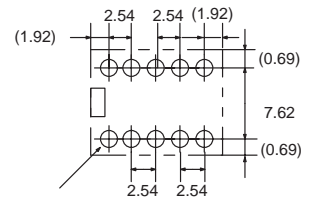
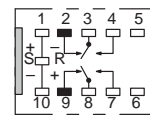
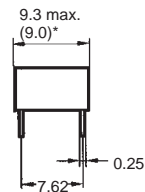
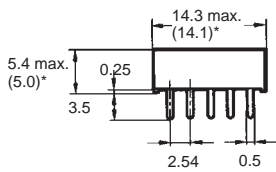
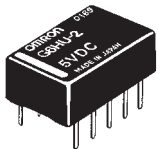
Tolerance:  $\pm 0.1$



Ten, 1-dia. holes

## Single-winding Latching Type

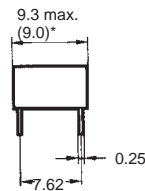
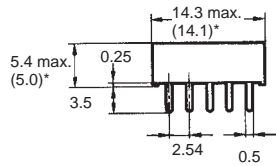
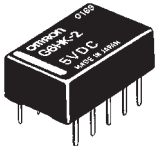
### G6HU-2(-U)



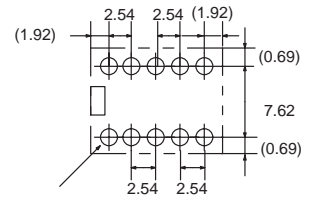
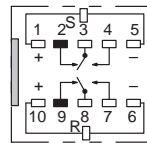
Ten, 1-dia. holes

## Double-winding Latching Type

### G6HK-2(-U)



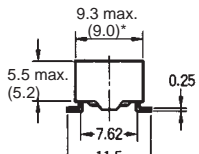
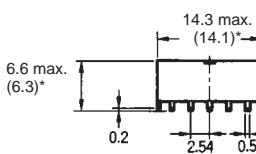
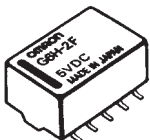
\* Average value



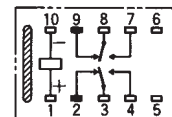
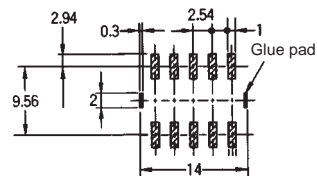
Ten, 1-dia. holes

## Single-side Stable Type

### G6H-2F



\* Average value



**ALL DIMENSIONS SHOWN ARE IN MILLIMETERS.**  
To convert millimeters into inches, multiply by 0.03937. To convert grams into ounces, multiply by 0.03527.

# SMT COMMON MODE CHOKES

## 1.22A to 14.0A



- Solutions based on impedance, size and current
- Designed for DC/DC converters
- Wide variety of inductor sizes and current ratings available
- Dielectric strength: 1000V<sub>RMS</sub>

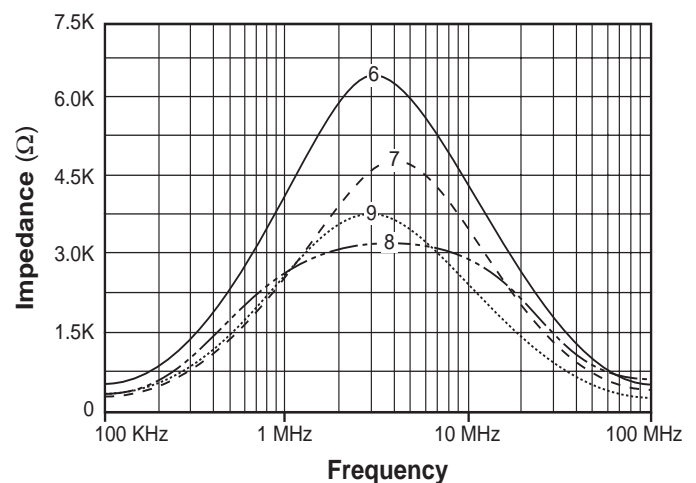
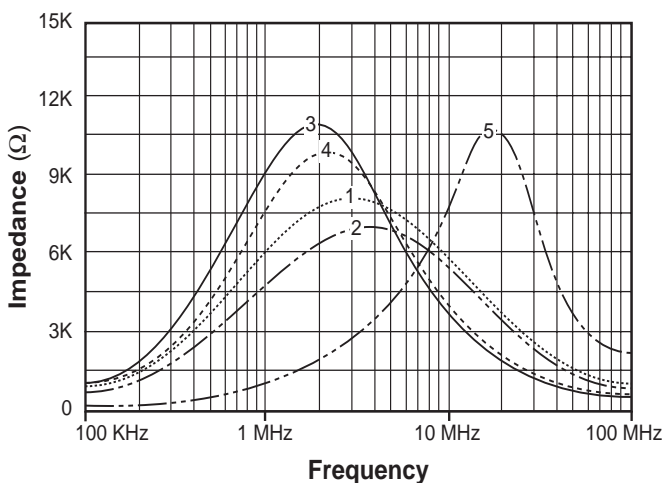
### Electrical Specifications @ 25°C — Operating Temperature -40°C to +120°C<sup>3</sup>

Part <sup>1,2</sup> Number	Inductance (mH ±35%)	Irated (A)	DCR (MAX) (mΩ)	Curve (see # below)	Package	Weight (Grams)	Quantity In Tube	Quantity In Reel
P0502NL	0.47	14.0	8	9	Big Foot	14.8	15	75
P0469NL	0.63	11.6	10	7	Big Foot	14.3	20	75
P0429NL	0.81	9.70	14	6	Big Foot	13.5	20	75
P0527NL	0.53	7.20	15	8	HCCI-68	7.7	15	100
P0353NL	0.59	5.60	21	7	LCCI-50	5.2	30	200
P0422NL	0.77	4.70	40	6	LCCI-50	4.9	30	200
P0421NL	0.22	3.30	60	5	LCCI-50	4.7	30	200
P0420NL	1.32	3.30	60	4	LCCI-50	4.6	30	200
P0351NL	1.47	2.80	80	3	LCCI-50	4.3	30	200
P0473NL	0.88	1.63	110	2	Polecat	1.5	40	500
P0354NL	1.17	1.22	200	1	Polecat	1.4	40	500

#### NOTE:

1. Optional Tape & Reel packaging can be ordered by adding a "T" suffix to the part number (i.e. P0502 becomes P0502T). Pulse complies to industry standard tape and reel specification EIA481.
2. The "NL" suffix indicates an RoHS-compliant part number. Non-NL suffixed parts are not necessarily RoHS compliant, but are electrically and mechanically equivalent to NL versions. If a part number does not have the "NL" suffix, but an RoHS compliant version is required, please contact Pulse for availability.
3. The temperature of the component (ambient plus temperature rise) must be within the stated operating temperature range.

### Impedance Curves





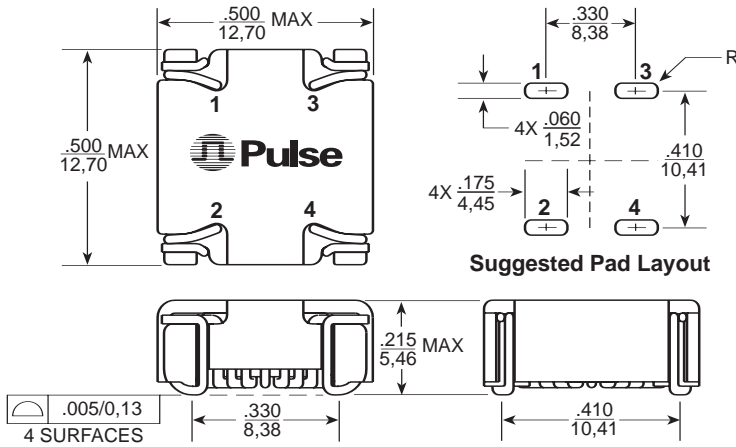
# SMT COMMON MODE CHOKES

## 1.22A to 14.0A

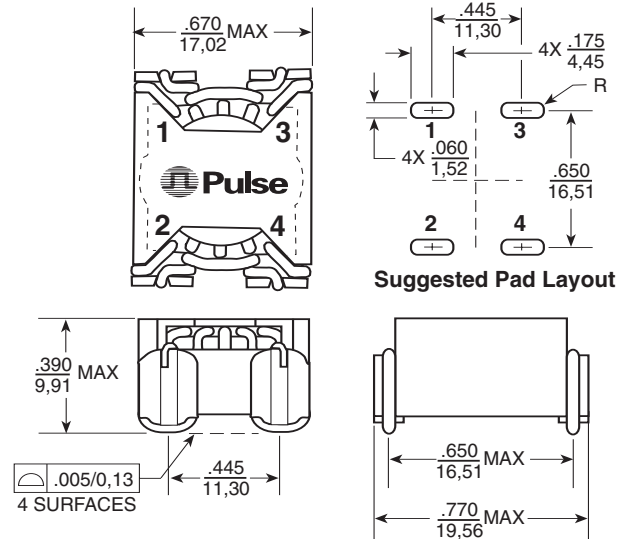


### Mechanicals

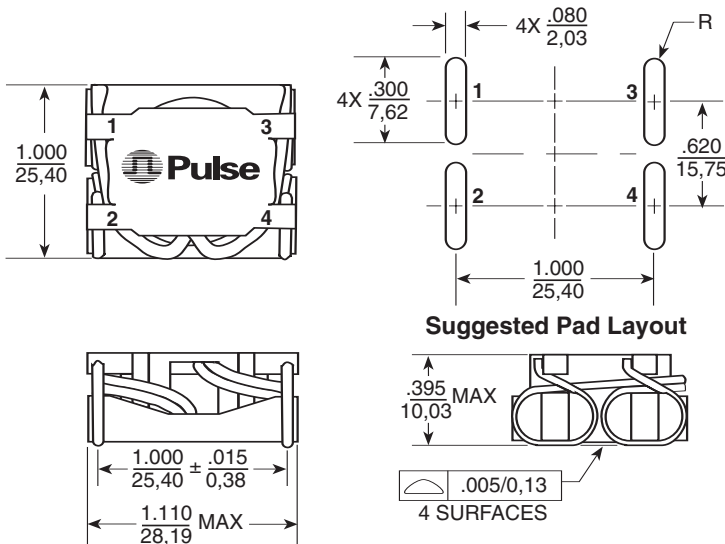
#### Polecat



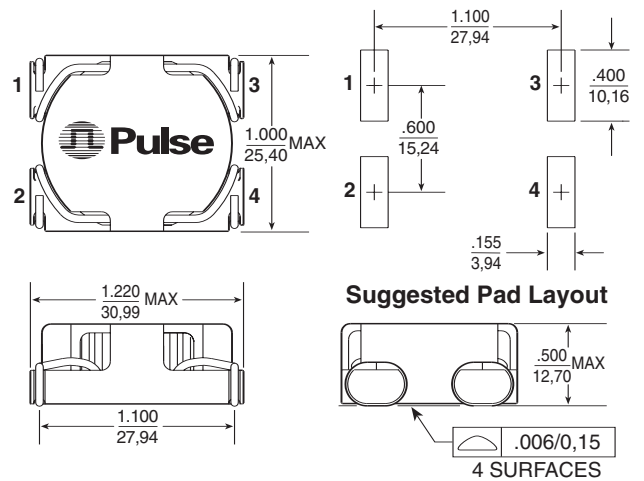
#### LCCI-50



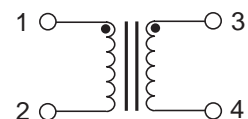
#### HCCI-68



#### Big Foot



### Schematic



Dimensions:  $\frac{\text{Inches}}{\text{mm}}$

Unless otherwise specified, all tolerances are  $\pm \frac{.005}{0,13}$

# T1/CEPT/ISDN-PRI TRANSFORMERS

## Dual Surface Mount, 1500Vrms, Small Package



- Dual SMT package contains both transmit and receive transformers
- Models matched to leading transceiver ICs
- UL recognized (some parts pending approval)
- RoHS compliant versions available upon request

### Electrical Specifications @ 25°C

Part # (STD temp.)	Part # (EXT temp.)	Turns Ratio <sup>B</sup> (Pri:Sec ±5%)	OCL (mH MIN)	C <sub>w/w</sub> (pF MAX)	L <sub>L</sub> (μH MAX)	DCR Pri (Ω MAX)	Package/Schematic	Primary Pins
PE-65861	T1090	1CT:2CT & 1CT:2CT	1.20 & 1.20	30 & 30	.60 & .60	0.70 & 0.70	BH/1	16-14, 6-8
PE-65862	T1091	1CT:2CT & 1:1.36CT	1.20 & 1.20	30 & 30	.60 & .60	0.70 & 0.70	BH/2	16-14, 6-8
PE-65865	T1076	1:1.15CT & 1CT:2CT	1.20 & 1.20	30 & 30	.60 & .60	0.70 & 0.70	BH/3	16-14, 6-8
PE-65866 <sup>E</sup>	T1092 <sup>E</sup>	1:1/1.26 & 1CT:2CT	1.20 & 1.20	30 & 30	.60 & .60	0.70 & 0.70	BH/3	16-14, 6-8
PE-65870	T1093	1CT:1.15CT & 1CT:1.15CT	1.20 & 1.20	30 & 30	.60 & .60	0.70 & 0.70	BH/1	1-3, 6-8
T1022	T1077	1CT:1CT & 1CT:1.5CT	1.20 & 1.20	30 & 30	.80 & .80	0.70 & 0.70	BH/1	16-14, 6-8
PE-68678	T1094	1CT:1CT & 1CT:2CT	1.20 & 1.20	30 & 30	.60 & .60	0.70 & 0.70	BH/1	16-14, 6-8
PE-68786	T1095	1CT:1.41CT & 1CT:1.41CT	1.00 & 1.00	30 & 30	.60 & .60	0.70 & 0.70	BH/1	16-14, 11-9
T1023	T1096	1CT:1.41CT & 1CT:1.41CT	1.00 & 1.00	30 & 30	.60 & .60	0.70 & 0.70	BH/1	1-3, 11-9
—	T1144	1CT:1CT & 1CT:2.4CT	1.00 & 1.00	30 & 30	.80 & .80	0.85 & 0.85	BH/1	9-11, 1-3
—	T1097	1CT:1CT & 1CT:1.67CT	1.00 & 1.00	25 & 25	.80 & .80	0.80 & 0.80	BH/1	6-8, 14-16
T1136	—	1CT:1CT & 1CT:1.36CT	1.20 & 1.20	30 & 30	.60 & .60	0.70 & 0.70	BH/1	6-8, 1-3
T1121	—	1CT:1.5CT & 1CT:1.5CT	1.50 & 1.50	40 & 40	.80 & .80	0.70 & 0.70	BH/1	1-3, 6-8
T1122	—	1CT:2CT & 1CT:2.3CT	1.20 & 1.20	30 & 30	.80 & .80	0.90 & 0.90	BH/1	6-8, 14-16
T1021 <sup>I</sup>	—	2CT:1/1.26 & 2CT:1/1.26	1.50 & 1.50	40 & 40	.50 & .50	0.70 & 0.70	BH/1	1-3, 11-9
T1075 <sup>I</sup>	—	2CS:1.57/2 & 2CS:1.57/2	1.50 & 1.50	40 & 40	.50 & .50	0.70 & 0.70	BH/4	1-2, 5-6
T1190	—	1CT:1CT & 1CT:1.36CT	1.20 & 1.20	30 & 30	.60 & .60	0.70 & 0.70	BH/1	16-14, 6-8
T1137	TX1287	1CT:2.42CT & 1CT:2.42CT	1.20 & 1.20	25 & 25	.60 & .60	0.70 & 0.70	BH/1	1-3, 6-8
—	T1146	1:2/2.4 & 1:0.79/1	1.00 & 1.00	35 & 35	1.00 & 1.00	0.80 & 0.80	BH/5	1-3, 6-8
T1286	—	1CT:2.4CT & 1CT:2.4CT	1.20 & 1.20	15 & 15	.30 & .30	0.30 & 0.30	BH/1	1-3, 6-8
—	TX1317	1:2CT & 1:2CS	1.20 & 1.20	35 & 35	.50 & 1.00	1.00 & 1.00	BH/6	1-3, 11-9
—	TX1189	1:1.36CT & 1:2CT	1.20 & 1.20	30 & 30	.60 & .60	1.00 & 1.00	BH/7	16-14, 6-8
—	TX1188	1CT:2CT & 1CT:2CT	1.20 & 1.20	30 & 30	.60 & .60	0.70 & 0.70	BH/1	1-3, 6-8
—	TX1187	1CT:2CT & 1:1	1.20 & 1.20	30 & 30	.60 & .60	0.70 & 0.70	BH/8	1-3, 6-8
—	TX1088	1CT:2CT & 1CT:2.42CT	1.20 & 1.20	35 & 35	.80 & .80	1.00 & 1.00	BH/1	1-3, 6-8
—	TX1089	1CT:1CT & 1CT:1CT	1.20 & 1.20	30 & 30	.80 & .80	0.70 & 0.70	BH/1	1-3, 6-8
—	TX1098	1CT:1.26CT & 1CT:1.26CT	1.20 & 1.20	30 & 30	.60 & .60	0.70 & 0.70	BH/1	1-3, 6-8
—	TX1099	1CT:1:0.8 & 1CT:1:0.8	1.20 & 1.20	30 & 30	.80 & .80	1.00 & 1.00	BH/4	16-14, 11-9
—	TX1186	1CT:1.58:2 & 1:1.65:2	1.20 & 1.20	30 & 30	.80 & .80	1.00 & 1.00	BH/9	2-4, 6-7
—	TX1467	1CT:1:1 & 1CT:1:1	1.20 & 1.20	30 & 30	.80 & .80	1.00 & 1.00	BH/4	16-14, 11-9

NOTE: Standard (STD) operating temperature range is 0°C to 70°C. Extended (EXT) operating temperature range is -40°C to +85°C. RoHS-6 compliant parts can be ordered by adding an "NL" suffix to the part number (i.e. PE-65861 becomes PE-65861NL). (See Pages 6 and 7 for Table Notes)

### Mechanical

### Schematics

**Weight** ..... 1.0 grams  
**Tape & Reel** ..... .600/reel  
**Tube** ..... .40/tube

**Dimensions:** Inches / mm  
 Unless otherwise specified, all tolerances are ± .010 / 0.25

# UM2700 SERIES

## 10W to 15 Watt DC-DC Converters

- ◆ 2:1 Input Range
- ◆ Efficiency to 83%
- ◆ Pi Input Filter
- ◆ Continuous Short Circuit Protection
- ◆ Conductive EMI Meet CISPR22 Class A

### SPECIFICATIONS

All specifications are typical at nominal line, full load and 25°C unless otherwise noted.

### INPUT SPECIFICATIONS

Input Voltage Range, 12V .....	9-18V
24V .....	18-36V
48V .....	36-72V
Input Filter .....	Pi Network

### OUTPUT SPECIFICATIONS

Voltage Accuracy, Single Output .....	±1% max.
Dual, +Output .....	±1% max.
-Output .....	±1% max.
Triple, +5V .....	±1% max.
Auxiliaries .....	±3% max.
Voltage Balance, Dual Output at Full Load, .....	±1.0% max.
Transient Response	
Single, 25% Step Load Change .....	<500µ sec.
Dual, FL-1/2FL, ±1% Error Band .....	<500µ sec.
Ripple and Noise, 20MHz BW <sup>1</sup> .....	75mV P-P max.
Triple Output Auxiliaries .....	125mV P-P max.
Temperature Coefficient .....	±0.02%/°C max.
Short Circuit Protection .....	Continuous
Line Regulation <sup>2</sup> , Single/Dual Output .....	±0.2% max.
Triple Output +5V .....	±1% max.
Auxiliaries .....	±3% max.
Load Regulation <sup>3</sup> , Single Output.....	±0.2% max.
Dual Output ± 5V.....	±2.0% max.
Output ± 12V/15V.....	±1.0% max.
Triple Output +5V .....	±2.0% max.
Auxiliaries .....	±5.0% max.

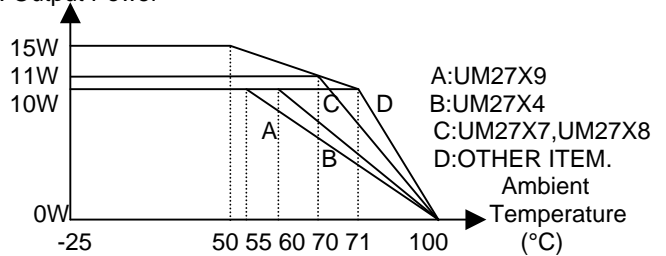
### GENERAL SPECIFICATIONS

Efficiency .....	See Table
Isolation Voltage .....	1500 VDC min.
Isolation Resistance .....	10 <sup>8</sup> Ohms min.
Switching Frequency	
Single/Dual .....	400KHz
Triple .....	250KHz
Operating Temperature Range <sup>4</sup> .....	-25°C to +100°C
Storage Temperature Range .....	-55°C to +105°C
EMI/RFI <sup>5</sup> .....	Six-Sided Continuous Shield
Dimensions .....	2 x 1 x 0.4 inches (50.8 x 25.4 x 10.2mm)
Case Material <sup>6</sup> .....	Black-Coated Copper with Non-Conductive Base
Weight .....	30g

### NOTES:

1. Triple Output: Measured with 1µF ceramic cap. cross to each output.
2. Measured from high line to low line.
3. Single: from full load to 1/4 load.  
Dual : from full load to 1/2 load.  
Triple: +5V from full load to 1/4 load, Auxiliaries Output balanced load from full load to 1/4 load.

### 4. Output Power



Maximum case temperature under any operating condition must not be exceeded 100°C

5. Conductive EMI Meet CISPR22 Class A (Triple output: Input terminals with external electronic cap. 100µF/100V).
6. Metal case only.

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MODEL NUMBER	INPUT VOLTAGE	OUTPUT VOLTAGE	OUTPUT CURRENT	INPUT CURRENT		% EFF	CASE
				NO LOAD	FULL LOAD		
UM2701	12VDC	5 VDC	3000 mA	50 mA	1605 mA	78	B
UM2702		12 VDC	1250 mA	50 mA	1565 mA	80	
UM2703		15 VDC	1000 mA	50 mA	1565 mA	80	
UM2704		± 5 VDC	± 1000 mA	50 mA	1070 mA	78	
UM2705		± 12 VDC	± 625 mA	50 mA	1545 mA	81	
UM2706		± 15 VDC	± 500 mA	50 mA	1545 mA	81	
UM2709		3.3 VDC	3000 mA	50 mA	1115 mA	74	
UM2711	24VDC	5 VDC	3000 mA	20 mA	785 mA	80	B
UM2712		12 VDC	1250 mA	20 mA	765 mA	82	
UM2713		15 VDC	1000 mA	20 mA	765 mA	82	
UM2714		± 5 VDC	± 1000 mA	20 mA	520 mA	80	
UM2715		± 12 VDC	± 625 mA	20 mA	755 mA	83	
UM2716		± 15 VDC	± 500 mA	20 mA	750 mA	83	
UM2717		+5/± 12VDC	1000± 250mA	25 mA	566 mA	81	
UM2718		+5/± 15VDC	1000± 200mA	25 mA	566 mA	81	
UM2719		3.3 VDC	3000 mA	20 mA	545 mA	76	
UM2721	48VDC	5 VDC	3000 mA	10 mA	390 mA	80	B
UM2722		12 VDC	1250 mA	10 mA	380 mA	82	
UM2723		15 VDC	1000 mA	10 mA	380 mA	82	
UM2724		± 5 VDC	± 1000 mA	10 mA	260 mA	80	
UM2725		± 12 VDC	± 625 mA	10 mA	375 mA	83	
UM2726		± 15 VDC	± 500 mA	10 mA	375 mA	83	
UM2727		+5/± 12VDC	1000± 250mA	20 mA	283 mA	81	
UM2728		+5/± 15VDC	1000± 200mA	20 mA	283 mA	81	
UM2729		3.3 VDC	3000 mA	10 mA	270 mA	76	

NOTE: Maximum capacitive load across the each output ports should not be over following indicated values.

MODEL NUMBER	UM27X1	UM27X9	UM2702	UM2712	UM2722	UM27X3	UM27X4	UM27X5	UM27X6	UM27X7	UM27X8
MAXIMUM CAPACTIVE LOAD	+2200uF	+470uF	+680uF	+680uF	+330uF	+470uF	+330uF	+270uF	+330uF	+330uF	+330uF
						-470uF	-330uF	-270uF	-68uF	-68uF	-68uF

CASE B

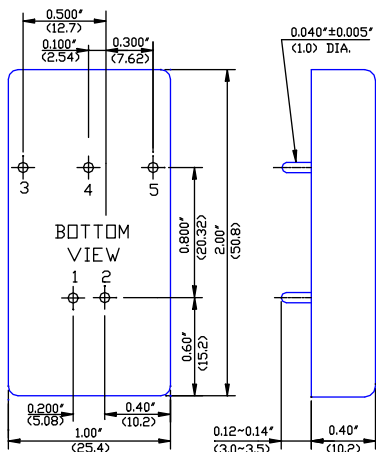


Fig.A

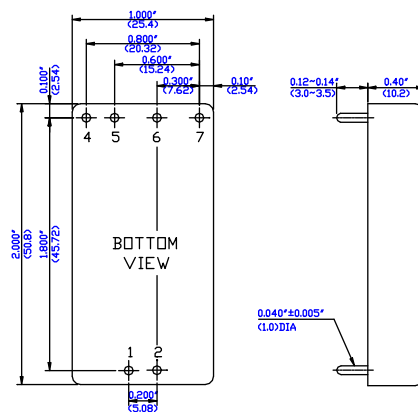


Fig.B

Fig	PIN CONNECTIONS	
	A	B
Pin	Single/Dual	Triple
1	+Input	+Input
2	-Input	-Input
3	+Output	No pin
4	Common/ NP*	+Aux. out
5	-Output	-Aux. out
6	-	Common
7	-	+5V out

\*NP(NO PIN)ON SINGLE OUTPUT

All dimensions in inches (mm).

Tolerance .xx=±0.04

.xxx=±0.010

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