

LOW-PROFILE SURFACE MOUNT MIL-STD-1553 PULSE TRANSFORMERS

FEATURES

- **Low Cost**
- **Moisture Sensitivity Rating Level 1**
- **For use in MIL-STD-1553A and B, MacAir A-3818, A-5690, A-5232, and A-4905**
- **Qualification tested to MIL-PRF-21038**
- **Tested to M-Level and T-Level (Optional) of MIL-PRF-21038**
- **-55°C to +130°C Operating Temperature Range**
- **Robust Lead Design for Improved Coplanarity**

Description and Applications

The military data bus specification, MIL-STD-1553, has brought about the need for versatile pulse transformers that meet all the electrical requirements of Manchester II serial bi-phase data transmission. The LPB-5000 series of transformers provide the turns ratio configurations, component isolation, and common mode rejection ratio characteristics necessary for MIL-STD-1553A and B compliance.

The step-up and step-down ratios that are available with the LPB-5000 series complement DDC's entire MIL-STD-1553 product line and are compatible with competitors' drivers, receivers, and transceivers. These transformers are low-profile, modular units that are multitapped to accommodate existing system configurations. Encapsulated in accordance with MIL-PRF-21038, their C5191 Phosphor Bronze, Sn90 plated leads conveniently accommodate printed circuit board mounting. Sinusoidal or trapezoidal waveforms are accurately processed, making the LPB-5000 series of transformers an excellent choice for any MIL-STD-1553A or B application.

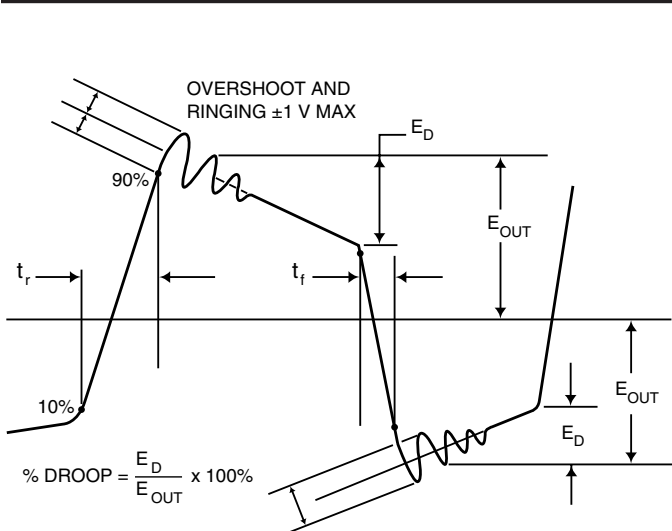


FIGURE 1. WAVEFORM INTEGRITY

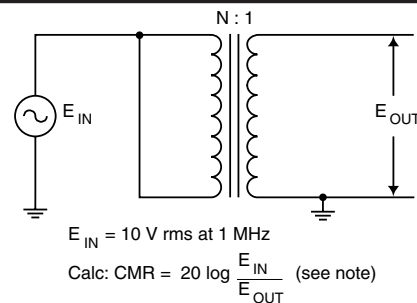
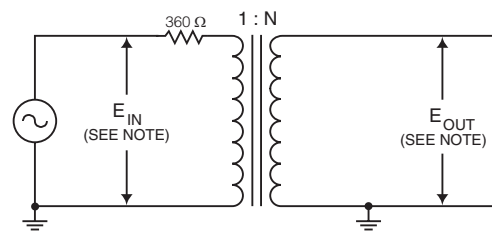


FIGURE 2. CIRCUIT FOR COMMON MODE REJECTION



E_{IN} = 250 kHz square wave, 27.0 volts peak-to-peak with a rise and fall time no greater than 100 ns.

Calc : Droop = $\frac{E_D}{E_{OUT}} \times 100\%$. (see figure 1 for E_D)

FIGURE 3. CIRCUIT FOR WAVEFORM INTEGRITY

Notes: 1) Input to be applied and output to be measured for all dash numbers are as shown. N represents highest turns winding in each test.
 2) For LPB-5033, the 360 Ω resistor is replaced with a 50 Ω resistor for conducting waveform test.

TABLE 1. LPB-5000 SERIES SPECIFICATIONS

PARAMETER	UNIT	VALUE	REMARKS
Case	—	—	Flame Resistant, Diallyl Phthalate
Terminals	—	—	C5191 Phosphor Bronze, Sn90 Plating
Weight	Oz.(gm)	0.105 (3) max.	
Terminal Strength	lbs	2	2 pounds applied force, Method 211, MIL-STD-202, Test condition A
Dielectric Withstanding Voltage	Vrms	100	Method 301, MIL-STD-202
Life (expectancy "X")	Hrs	10,000 min.	In accordance with MIL-PRF-21038
Insulation Resistance	MΩ	1,000 min.	At 250 Vdc using method 302, test condition B, MIL-STD-202
Pulse Width (of Output Pulse)	μs	2	Tested using FIGURE 3 with resulting FIGURE 1 waveform.
Overshoot	V	± 1 max.	Tested using FIGURE 3 with resulting FIGURE 1 waveform.
Rise Time (of Output Pulse)	ns	—	Tested using FIGURE 3 with resulting FIGURE 1 waveform. See respective ELECTRICAL CHARACTERISTICS TABLE
Common Mode Rejection	dB	≥ 45	Tested using FIGURE 2.
Operating Temperature Range	°C	-55 to +130	—
Storage Temperature Range	°C	-65 to +130	—
Drop	%	≤ 20	Tested using FIGURE 3 with resulting FIGURE 1 waveform.
DC Resistance	Ω	—	See respective Electrical Characteristics Table
Input Impedance	Ω	—	See respective Electrical Characteristics Table. Tested at 75 kHz and 1 MHz over entire operating temperature range.

CONFIGURATION

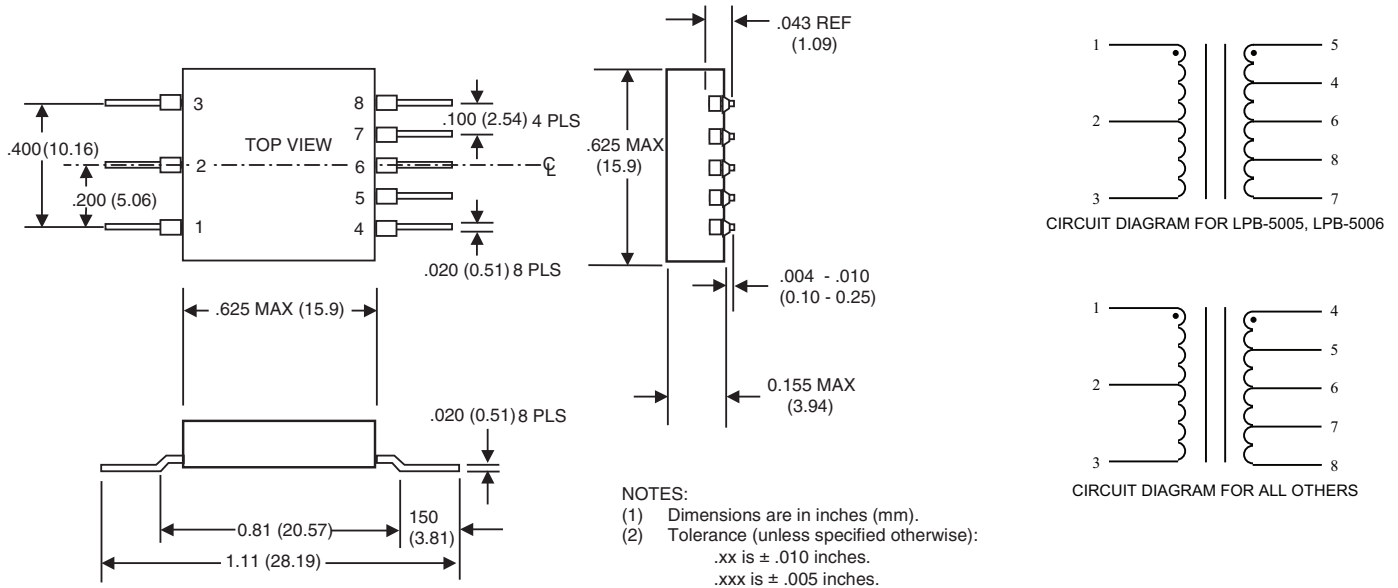
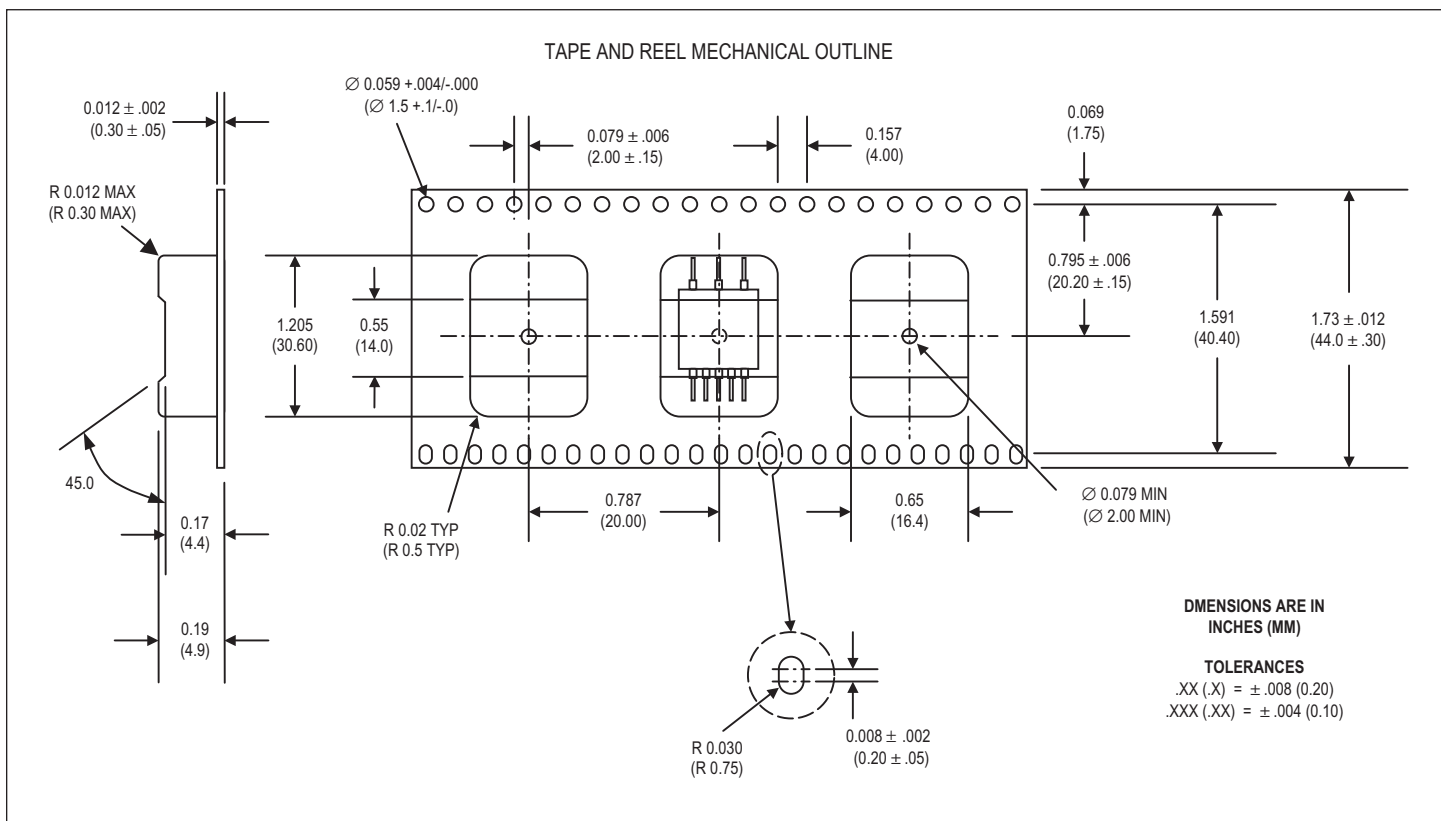


TABLE 2. ELECTRICAL CHARACTERISTICS

BETA P/N	TURNS RATIO	PRIMARY	SECONDARY	DC RESISTANCE Ω (MAX)	OUTPUT RISE TIME NSEC (MAX)	IMPEDANCE Ω (MIN)
LPB-5000	2:5 ±3% 4:7 ±3%	1-3 1-3	4-8 5-7	(1-3) 3.5 (4-8) 3.0	150	(4-8) 3,000
LPB-5001	1:0.83 ±3% 1:0.60 ±3%	1-3 1-3	4-8 5-7	(1-3) 3.0 (4-8) 3.0	150	(1-3) 3,000
LPB-5002	1.4:1 ±3% 2:1 ±3%	1-3 1-3	4-8 5-7	(1-3) 3.5 (4-8) 3.0	150	(1-3) 7,200
LPB-5003	1:1 ±3% 1:0.707 ±3%	1-3 1-3	4-8 5-7	(1-3) 3.0 (4-8) 3.0	150	(1-3) 4,000
LPB-5004	1.25:1 ±3% 1.66:1 ±3%	1-3 1-3	4-8 5-7	(1-3) 3.2 (4-8) 3.0	150	(1-3) 4,000
LPB-5005	2.3:1 ±3% 3.2:1 ±3%	4-8 5-7	1-3 1-3	(1-3) 1.2 (4-8) 3.0	150	(5-7) 3,000
LPB-5006	2.12 :1 ±3% 1.5 :1 ±3%	4-8 5-7	1-3 1-3	(1-3) 1.1 (4-8) 3.0	200	(4-8) 4,000
LPB-5015	1:2.5 ±3% 1:1.79 ±3%	1-3 1-3	4-8 5-7	(1-3) 1.0 (4-8) 3.0	250	(4-8) 3,000
LPB-5033	1: 3.75 ±3% 1: 2.70 ±3%	1-3 1-3	4-8 5-7	(1-3) 0.25 (4-8) 3.0	250	(4-8) 3,000

Notes:
 1) These transformers have been classified as IPC-9503 Level 1 and are not moisture sensitive. To ensure product integrity and maintain the product warranty, the reflow process must not cause the peak body temperature of the device to exceed 225°C and must not expose the device to temperatures above 183°C for more than 90 seconds. Tape and Reel packaging is available upon request. Contact factory for further information.



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