

DUAL SIDE-BY-SIDE PULSE TRANSFORMERS

FEATURES

- **Built and Tested to MIL-PRF-21038 & MIL-STD-202**
 - M-Level Screening (Standard)
 - T-Level Screening (Optional)
- **Surface Mount Configurations**
 - Tape and Reel Available
- **Available in 3.3, 5, 12 & 15 Volt Ratios**
- **For use with MIL-STD-1553A & B, MacAir A-5690, A-5232, A-3818, & A-4905**
- **-55°C to +130°C Operating Temperature Range**
- **Peak Reflow Temperature 225°C**
- **Available RoHS Compliant**



DESCRIPTION AND APPLICATIONS

The DSS-1000 Series of transformers are dual, side-by-side pulse transformers that provide the turns ratio configurations, component isolation, and common mode rejection ratio characteristics necessary for MIL-STD-1553 Data Bus specification compliance. These versatile pulse transformers meet all the electrical requirements of Manchester II serial bi-phase data transmission.

The step-up and step-down ratios available with the DSS series complement Data Device Corporation's (DDC's) entire MIL-STD-1553 line. These transformers are low-profile, modular units that are multi-tapped to accommodate existing system configurations. To meet the rugged demands of airborne and ground based military applications, they are encapsulated in accordance with MIL-PRF-21038. Sinusoidal or trapezoidal waveforms are transmitted with minimal distortion, making the DSS Series an excellent choice for any MIL-STD-1553A or B application.

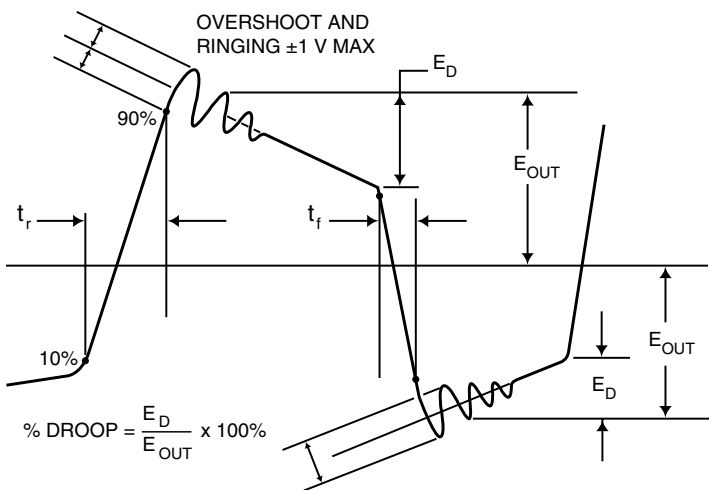


FIGURE 1. WAVEFORM INTEGRITY

Note:

1. Input to be applied and output to be measured for all dash numbers are shown. N represents highest turns winding in each test.
2. For DSS-1003, the 360 ohm resistor in Figure 3 is replaced with a 50 ohm resistor for conducting the waveform test.

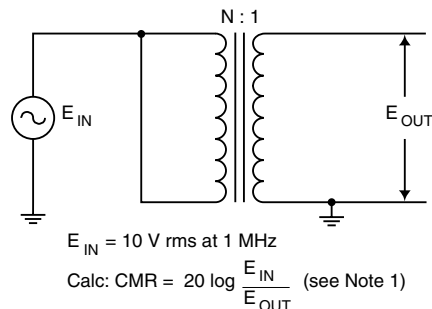
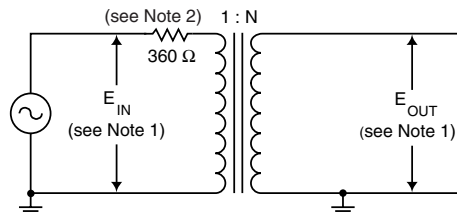


FIGURE 2. CIRCUIT FOR COMMON MODE REJECTION



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

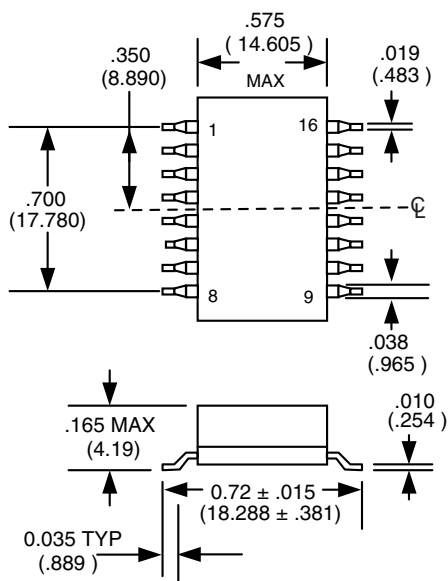
Calc: Droop = $\frac{E_D}{E_{OUT}}$ x 100%. (see Figure 1 for E_D)

FIGURE 3. CIRCUIT FOR WAVEFORM INTEGRITY

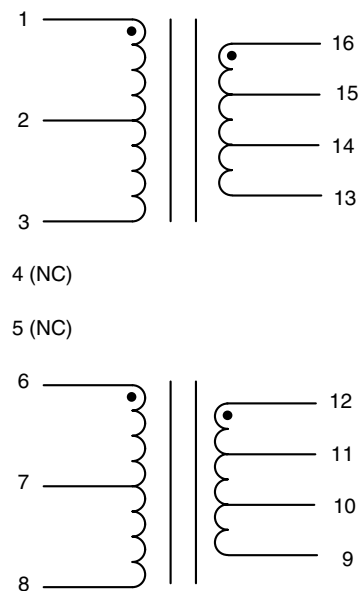
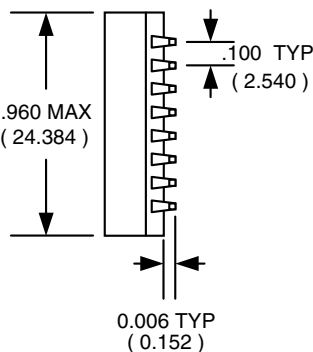
TABLE 1. GENERAL SPECIFICATIONS

PARAMETER	UNIT	VALUE	REMARKS
Case	—	—	Flame Resistant, Diallyl Phthalate
Terminals	—	—	C5191 Phosphor Bronze, Sn60Pb40 Plated, over Nickel Underplating
Terminals (Alternative)	—	—	C5191 Phosphor Bronze, Sn63Pb37 Dipped, over Matte SN100 Plating, over Nickel Underplating
Terminals (RoHS Version)	—	—	C5191 Phosphor Bronze, Matte Sn100 Plating, over Nickel Underplating
Weight	Oz (gm)	0.353 (10) max	—
Terminal Strength	lbs	2	2 pounds applied force, Method 211, MIL-STD-202, Test Condition A
Dielectric Withstanding Voltage	Vrms	100	Method 310, 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 (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 (Output Pulse)	ns	—	Tested using FIGURE 3 with resulting FIGURE 1 waveform See ELECTRICAL CHARACTERISTICS TABLE
Common Mode Rejection	dB	45	Tested using FIGURE 2
Operating Temperature Range	°C	-55 to +130	—
Droop	%	≤ 20	Tested using Figure 3 with resulting FIGURE 1 waveform
DC Resistance	Ω	—	See ELECTRICAL CHARACTERISTICS TABLE
Input Resistance	Ω	—	See ELECTRICAL CHARACTERISTICS TABLE

CONFIGURATION



MECHANICAL OUTLINE



CIRCUIT DIAGRAM

Notes:

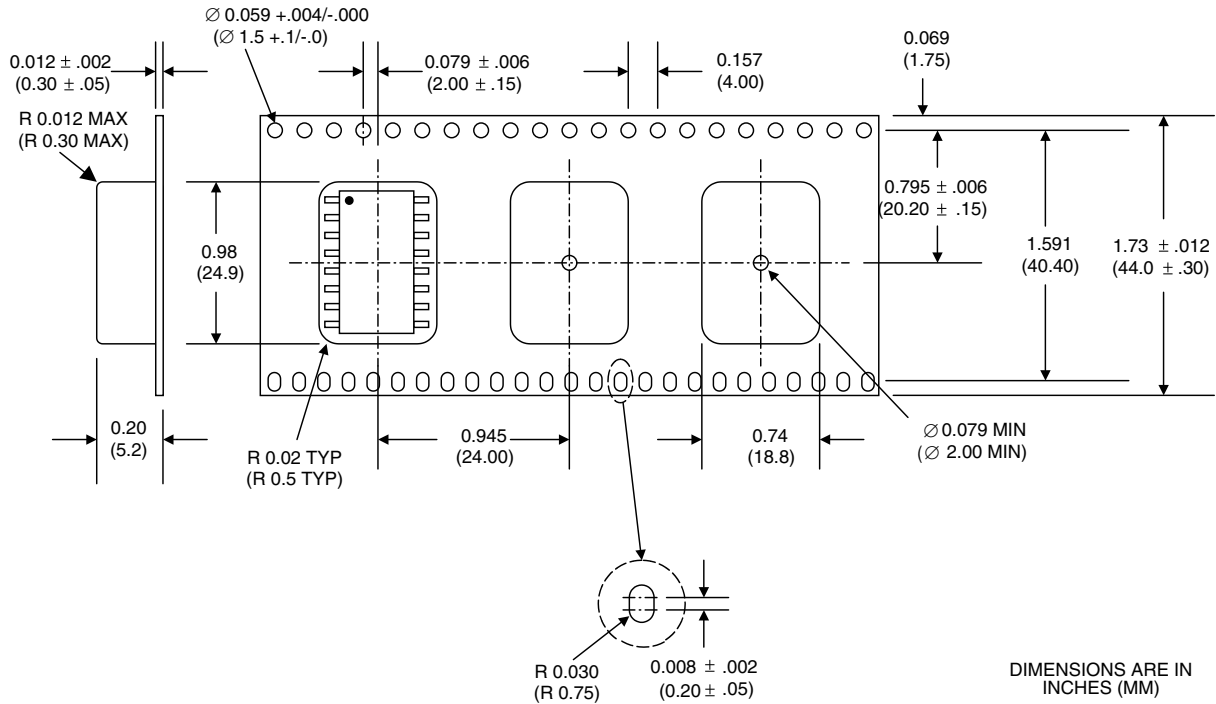
1. Dimensions are in inches (mm)
2. Tolerance, unless specified otherwise:
 - .xx is ± 0.010 inches (0.254)
 - .xxx is ± 0.005 inches (0.127)

TABLE 2. ELECTRICAL CHARACTERISTICS						
BETA P/N	PIN #S	TURNS RATIO ± 3%	DC RESISTANCE OHMS (MAX)	OUTPUT RISE TIME ns (MAX)	IMPEDANCE OHMS (MIN)	
					75 kHz to 150 kHz	150 kHz to 1 MHz
DSS-1003	1-3 (6-8) : 16-13 (12-9) 1-3 (6-8) : 15-14 (11-10)	1 : 3.75 1 : 2.7	(1-3), (6-8) 0.35 (16-13), (12-9) 3.0	250	(16-13), (12-9) 3,000	(16-13), (12-9) 4,000
DSS-1005	1-3 (6-8) : 16-13 (12-9) 1-3 (6-8) : 15-14 (11-10)	1 : 2.5 1 : 1.79	(1-3), (6-8) 1.0 (16-13), (12-9) 3.5	250	(16-13), (12-9) 3,000	(16-13), (12-9) 4,000
DSS-1012	1-3 (6-8) : 16-13 (12-9) 1-3 (6-8) : 15-14 (11-10)	1.25 : 1 1.66 : 1	(1-3), (6-8) 3.2 (16-13), (12-9) 3.0	150	(1-3), (6-8) 3,000	(1-3), (6-8) 4,000
DSS-1015	1-3 (6-8) : 16-13 (12-9) 1-3 (6-8) : 15-14 (11-10)	1.4 : 1 2 : 1	(1-3), (6-8) 3.5 (16-13), (12-9) 3.0	150	(1-3), (6-8) 5,000	(1-3), (6-8) 7,200
DSS-1630	1-3 (6-8) : 16-13 (12-9) 1-3 (6-8) : 15-14 (11-10)	1 : 2.65 1 : 2.07	(1-3), (6-8) 0.29 (16-13), (12-9) 1.10	250	(16-13), (12-9) 2,000	(16-13), (12-9) 4,000

RoHS Ordering Information: Add "-R" to standard part number (i.e. DSS-1003-R) (See note 3)

- Notes:**
1. These transformers have been classified as Level 3 rating per IPC-9503, and must be processed accordingly. To ensure product integrity and maintain product warranty, the customer must comply with the storage and handling conditions as specified in IPC-9503 for a level 3 device. Transformers must be reflowed within 168 hours of removal from sealed bag. 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. These parts are provided dry-packed in accordance with J-STD-033. Tape and Reel packaging is available. Contact factory for further information.
 2. By providing surface mount parts that have been dried per IPC-9503 (Moisture Sensitivity Classification for Non-IC components) and Dry-Packed in accordance with J-STD-033 (Standard for handling, packing, shipping and use of Moisture/Reflow sensitive surface mount devices), Beta has significantly reduced the possibility of moisture sensitivity/reflow induced "Pop-corning" or Bulging during customer's reflow soldering process. Experiments performed by Beta and data provided by manufacturers of similar devices indicate that post reflow visual/mechanical anomalies can be reduced by more than 90%. Since customer reflow profiles and CCA density can vary, Beta recommends that the customer verify solder process compatibility and yield assessment of these devices.
 3. The Lead-Free/RoHS compliant versions use Sn10Pb88Ag02 for internal solder joints. High melting temperature solder in excess of 85% lead is exempt until a suitable alternative is available. The external lead finish is matte-tin with a nickel barrier layer that has been certified to pass JESD22A121.01 tin whisker limits. The magnet wire used has a minimum Thermo-plastic Flow rating of 250°C. These transformers are classified as IPC-9503 level 5A. The peak body temperature shall not exceed 245°C, and the time over 183°C shall not exceed 150 seconds. The Lead-Free/RoHS compliant part numbers are the standard part, with an "-R" as the part number suffix. The bottom of the header has the Pb-free symbol embossed on it.

TAPE AND REEL MECHANICAL OUTLINE



TOLERANCES
 .XX (.X) = ± .008 (0.20)
 .XXX (.XX) = ± .004 (0.10)

PARTS PACKAGED ON 13" DIAMETER REEL,
 450 PARTS PER FULL REEL.

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