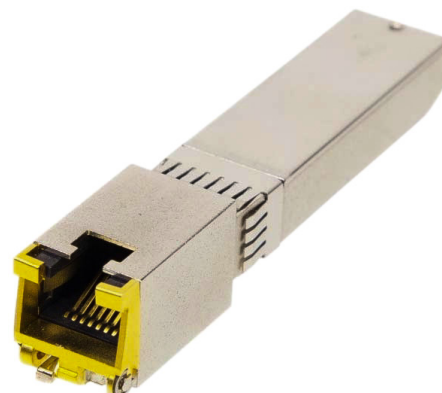


SERIES: DM7053 | DESCRIPTION: SFP+ 100/1000/2.5/5/10G TRANSCEIVER

FEATURES

- Supports 10GBASE-T Links up to 30 m using Cat6a cable
- Supports 100/1000/2.5/5G – up to 100 m using Cat5e or better
- SFF-8431 and SFF-8432 MSA compliant
- IEEE 802.3az compliant
- Low power consumption
 - (1.5 W max, 1.25 W typ, 30 m @ 10 G)
 - (1.5 W max, 1.2 W typ, 50 m @ 5 G)
 - (1.5 W max, 1.1 W typ, 50 m @ 2.5 G)
 - (1.0 W max, 800 mW typ, 100 m @ 1.0 G)
- Fast retrain EMI cancellation algorithm
- Low EMI emissions
- I²C 2-wire serial interface for serial ID and PHY registers
- Auto-negotiates with other NBASE-T PHYs
- MDI/MDIX Crossover
- Multiple loopback modes for testing and troubleshooting
- Built-in cable monitoring and link diagnostic features
 - Cable length measurements
 - Opens / shorts
- Robust die cast housing
- Bail latch style ejector mechanism
- Unshielded and shielded cable support



MODEL	Data Rate ¹ typ [Gbps]	Host Interface	Power Consumption max [W]	Reach max [m]	Cable Type
DM7053	10	SGMII	1.5	30	CAT6a
	5	SGMII	1.5	50	CAT5e
	2.5	SGMII	1.5	50	CAT5e
	1	SGMII	1.0	100	CAT5e

PART NUMBER KEY

DM7053 X - XXX

Type / Product Series
DM7053 = Product Series

Interface / Variant Code
SGMII

Speed / Reach Code
Refer to model table

ELECTRICAL - HOST INTERFACE

Parameter	Conditions	Min	Typ	Max	Units
Supply voltage	Vcc, referenced to GND	3.135	3.3	3.465	V
Low speed input voltage		-0.5		Vcc+0.3	V
2-wire interface input voltage		-0.3		Vcc+0.5	V
Host interface	SGMII / I2C				
Power consumption	All speeds, full duplex (see Model table)	0.8	1.25	1.5	W

ELECTRICAL - LINE INTERFACE

Parameter	Conditions	Min	Typ	Max	Units
Line standard	IEEE 802.3bz / 802.3az				
Reach	Per cable type, see Model table			100	m
Cable / medium	Cat5e (1G/2.5G/5G) / Cat6a (10G), unshielded or shielded				
Auto-negotiation	Auto-negotiates with other NBASE-T PHYs; MDI/MDIX crossover				
Fast Retrain EMI cancellation	Reduces radiated emissions during retrain events				

MANAGEMENT INTERFACE

Parameter	Conditions	Min	Typ	Max	Units
Serial interface	I2C 2-wire serial interface for Serial ID and PHY register access				
EEPROM	Serial ID EEPROM at address 0xA0 (SFF-8472 base/extended ID fields)				
Register access	I2C-to-MDIO bridge; slave address 0x56 (7-bit) / ACh-ADh (8-bit R/W); Clause 45 PHY register access				
Status signals	Rx_LOS (link status), Tx_Fault, Mod_ABS, Rate Select (RS0/RS1)				
Diagnostics	Built-in cable length measurement, open/short detection, multiple loopback modes				

SFP PIN ASSIGNMENT

Pin	Symbol	Function	Pin	Symbol	Function
1	VeeT	Transmitter ground	11	VeeR	Receiver ground
2	Tx_Fault	Transmitter fault, open collector	12	RD-	Receiver inverted data output
3	Tx_Disable	Transmitter disable (internal pull-up)	13	RD+	Receiver non-inverted data output
4	SDA	2-wire serial interface data line	14	VeeR	Receiver ground
5	SCL	2-wire serial interface clock	15	VccR	Receiver 3.3V supply
6	Mod_ABS	Module absent (grounded in module)	16	VccT	Transmitter 3.3V supply
7	RS0	Rate select 0	17	VeeT	Transmitter ground
8	Rx_LOS	Loss of signal (used as link status)	18	TD+	Transmitter non-inverted data input
9	RS1	Rate select 1	19	TD-	Transmitter inverted data input
10	VeeR	Receiver ground	20	VeeT	Module transmitter ground

Note:
1. The module signal grounds is isolated from the module case.
2. Host to provide pull-up.

SAFETY AND COMPLIANCE

Parameter	Compliant
Safety approvals	UL/CSA 60950 and IEC 60950, SFF-8431 and SFF-8432 MSA compliant, IEEE 802.3az compliant
EMC	FCC Part 15 Class A / EN 55032. Meets Class B with ≥4 dB margin using shielded cables. Recommended test range: 10 kHz – 18 GHz
ESD	IEC 61000-4-2. 8 kV air discharge / 4 kV contact discharge on accessible portions (front panel connector). Criteria B per 25 discharges (both polarities, air/contact)
Flammability	SFP module PCB min. UL 94V-0 flame rated
RoHS	Compliance with RoHS and Halogen Free

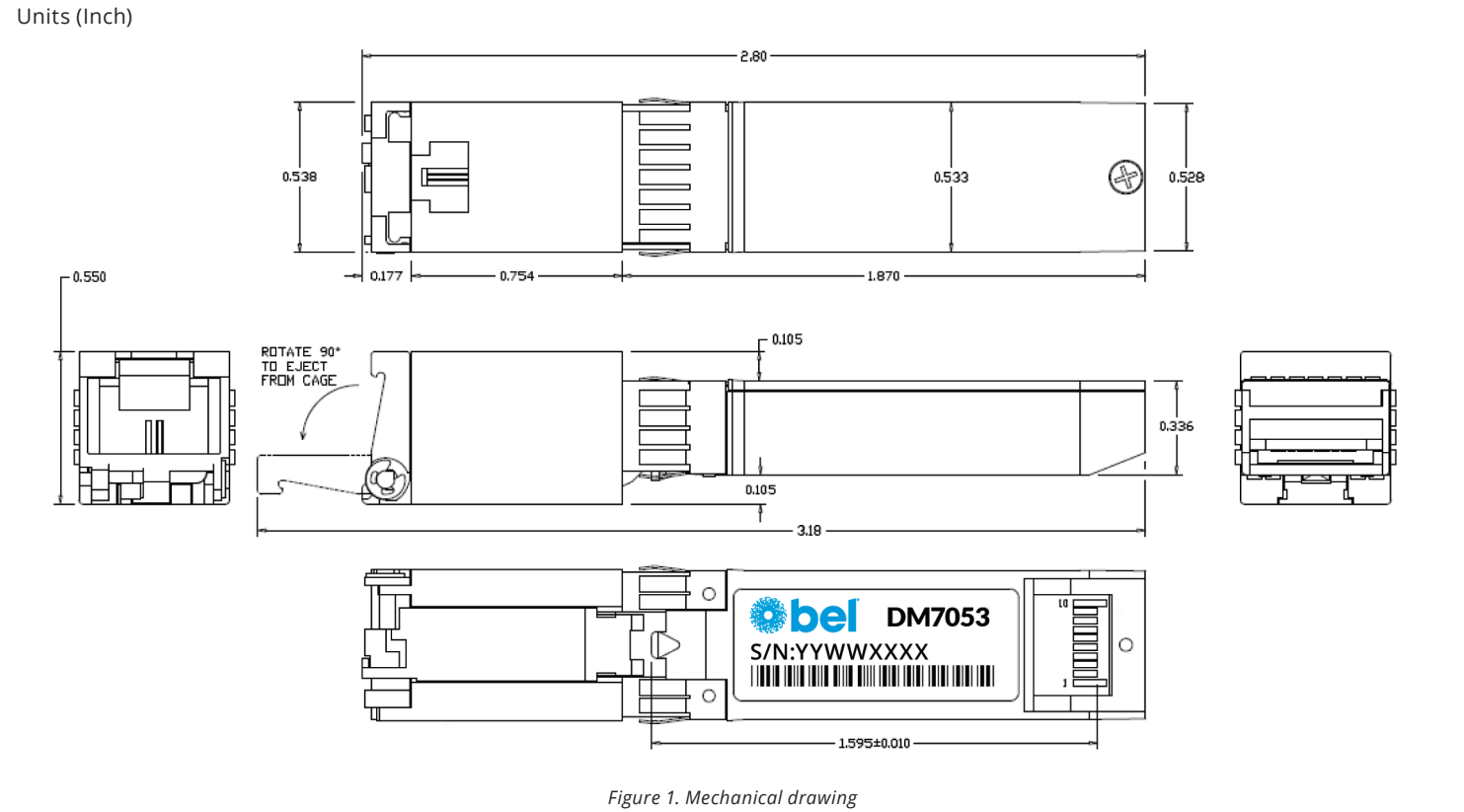
ENVIROMENTAL

Parameter	Conditions	Min	Typ	Max	Units
Operating temperature	Tc, commercial / industrial grade	-5	20	85	°C
Storage temperature	Ts	-40	20	85	°C
Humidity	RH, Non-condensing	5		95	%RH

MECHANICAL

Parameter	Conditions	Min	Typ	Max	Units
Form factor	SFP / SFP+ MSA compliant				
Housing	Zinc die-cast body with nickel plating				
Connector	Shielded RJ-45				
Ejector mechanism	Bail latch, gold flash over nickel plating				
Dimensions		2.80 x 0.538 x 0.550			inch
Weight		TBD			g

MECHANICAL DRAWING



FUNCTIONAL BLOCK DIAGRAM

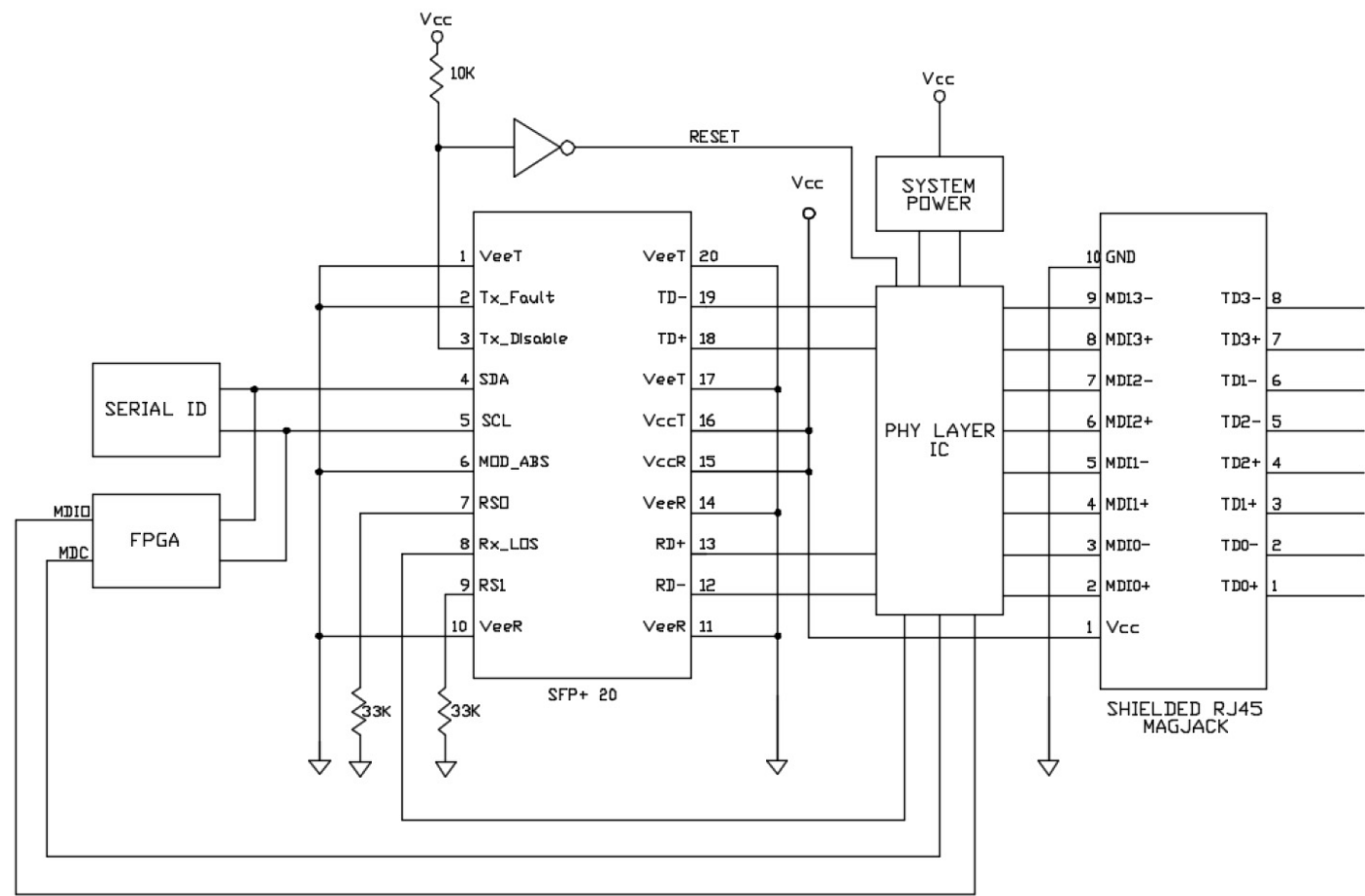


Figure 2. Block diagram

LATCH REQUIREMENTS

Parameter	Conditions	Min	Typ	Max	Units
SFP transceiver insertion	Without cage kick-out spring force; nominal cage			18	N
SFP transceiver extraction	Without cage kick-out spring force; nominal cage			12.5	N
SFP transceiver retention	No functional damage below 90 N	90		170	N
Insertion/removal cycles	No functional damage to module, cage, or connector	50			cycles

Note:
3. Bail-type ejector latch releases the module regardless of row position when adjacent SFP ports are populated; passes RJ-45 connector "wiggle" stress test.

SERIAL IDENTIFICATION (EEPROM, ADDRESS A0h)

Data Address	Field Size	Field Name	Field Description	Field Value	Value Description
BASE ID FIELDS					
0	1	Identifier	Type of transceiver	03	SFP TRANSCEIVER
1	1	Ext. Identifier	Extended identifier of type of serial transceiver	04	WITH SERIAL ID
2	1	Connector	Code for connector type	00	Unspecified (RJ-11) Twisted Pair
3-10	8	Transceiver	Code for electronic or optical compatibility	00,00,00,00,00,00,40,00	Wave-2 G.hn is Undefined in SFF8472
11	1	Encoding	Code for serial encoding algorithm	00	UNSPECIFIED
12	1	BR, Nominal	Nominal signaling rate, units of 100Mbps/sec	11	1.7 Gbps
13	1	Rate Identifier	Type of rate select functionality	00	UNSPECIFIED
14	1	Length (SMF, km)	Link length supported for single mode fiber, units of km	00	NA
15	1	Length (SMF)	Link length supported for single mode fiber, units of 100 m	00	NA
16	1	Length (50mm)	Link length supported for 50mm OM2 fiber, units of 10 m	00	NA
17	1	Length (62.5mm)	Link length supported for 62.5mm OM1 fiber, units of 10 m	00	NA
18	1	Length (cable)	Link length supported for copper or direct attach cable, units of m	64	100m
19	1	Length (OM3)	Link length supported for 50mm OM3 fiber, units of 10 m	00	RESERVED
20-35	16	Vendor name	SFP vendor name (ASCII)	42,65,6C,20,50,6F,77,65,72,20,49,6E,63,2E,20,20	Bel Power Inc. (ASCII)
36	1	Transceiver	Code for electronic or optical compatibility	00	Unspecified
37-39	3	Vendor OUI	SFP transceiver vendor IEEE company ID	50,22,C9	Bel Power Inc. OUI
40-55	16	Vendor PN	Part number provided by SFP transceiver vendor (ASCII)	TBD	DM7053 (ASCII)
56-59	4	Vendor rev	Revision level for part number provided by vendor (ASCII)	TBD	
60-61	2	Wavelength	Laser wavelength (Passive/Active Cable Specification Compliance)	00,00	RESERVED
62	1	Unallocated		00	RESERVED
63	1	CC_BASE	Check code for Base ID Fields (addresses 0 to 62)	VARIABLES	
EXTENDED ID FIELDS					
64-65	2	Options	Indicates which optional SFP signals are implemented	20,10	Power Class 3, TX_DISABLE implemented
66	1	BR, max	Upper bit rate margin, units of %	00	
67	1	BR, min	Lower bit rate margin, units of %	00	
68-83	16	Vendor SN	Serial number provided by vendor (ASCII)	VARIABLES	(ASCII)
84-91	8	Date code	Vendor's manufacturing date code	VARIABLES	YY-MM-DD-LOT#
92	1	Diagnostic Monitoring Type	Indicates which type of diagnostic monitoring is implemented (if any)	00	None included
93	1	Enhanced Options	Indicates which optional enhanced features are implemented (if any)	00	None included
94	1	SFF-8472 Compliance	Indicates which revision of SFF-8472 the transceiver complies with	00	None included
95	1	CC_EXT	Check code for the Extended ID Fields (addr. 64 to 94)	VARIABLES	
VENDOR SPECIFIC ID FIELDS					
96-127	32	Vendor Specific	Vendor Specific EEPROM	All FF's	
128-255	128	Reserved	Reserved	All FF's	

I2C-TO-MDIO BRIDGE PROTOCOL

Parameter	Value
Bridge I2C slave address	0x56 (7-bit) / ACh (write), ADh (read) (8-bit)
Writing data	6-byte I2C frame sent by the I2C Master [Slave Addr][MDIO DevAddr, Wr=0][Reg Addr MSB][Reg Addr LSB][Data MSB] [Data LSB]
Reading data	Dummy 4-byte I2C write frame: [Slave Addr, R/W=0][MDIO DevAddr, R=1][Reg Addr MSB][Reg Addr LSB] Subsequent 2-byte I2C read frame: [Slave Addr, R/W=1][Data MSB] [Data LSB]
PHY register access	Clause 45 addressing via MDIO Device Address (5 bits)

Note:
4. Bit-level timing diagrams and worked examples available in the DM7053 Application Note.

REGULATORY & QUALIFICATION TESTING

Test	Method / Condition
Radiated Emission (RE)	FCC Part 15 Class A; meets Class B with shielded cable (≥4 dB margin). Test range 10 kHz – 18 GHz
Electrostatic Discharge (ESD)	IEC 61000-4-2: 8 kV air / 4 kV contact on accessible module surfaces. Criteria B per 25 discharges (both polarities)
Traffic Susceptibility	Minimum 50% link utilization for preliminary evaluation; worst-case utilization for final evaluation. Rated to Performance Criteria A (≤1% packet loss, no retries/protocol failure/link loss beyond allowance)
Accelerated Aging	85°C case temperature, powered at 3.3 V, 2000 hours. Pass: unit completes ping/traffic test with no excessive corrosion.
Relative Humidity (non-operational)	MIL-STD-202G Method 103B: 85°C / 85% RH for 1000 hours, non-operational. Pass: unit completes ping/traffic test with no excessive corrosion.
Mechanical Shock	Half-sine wave, 1500G peak, 0.5 ms pulse width, 5 shocks per direction across 6 directions.
Vibration	Random vibration, 20G over 20–2000 Hz, 4 minutes per cycle, 4 cycles per axis.
Temperature Cycling	-5°C to +85°C, 10-minute dwell, 8-minute transition, 100 cycles (16 operational + 16 nonoperational units). No electrical/physical degradation permitted.

Note:
5. Shock, vibration, and temperature-cycling failure criteria: failure to complete ping/traffic test, or excessive corrosion of components.

REVISION HISTORY

Rev.	Description	Date
1	Initial release	08/07/2026

