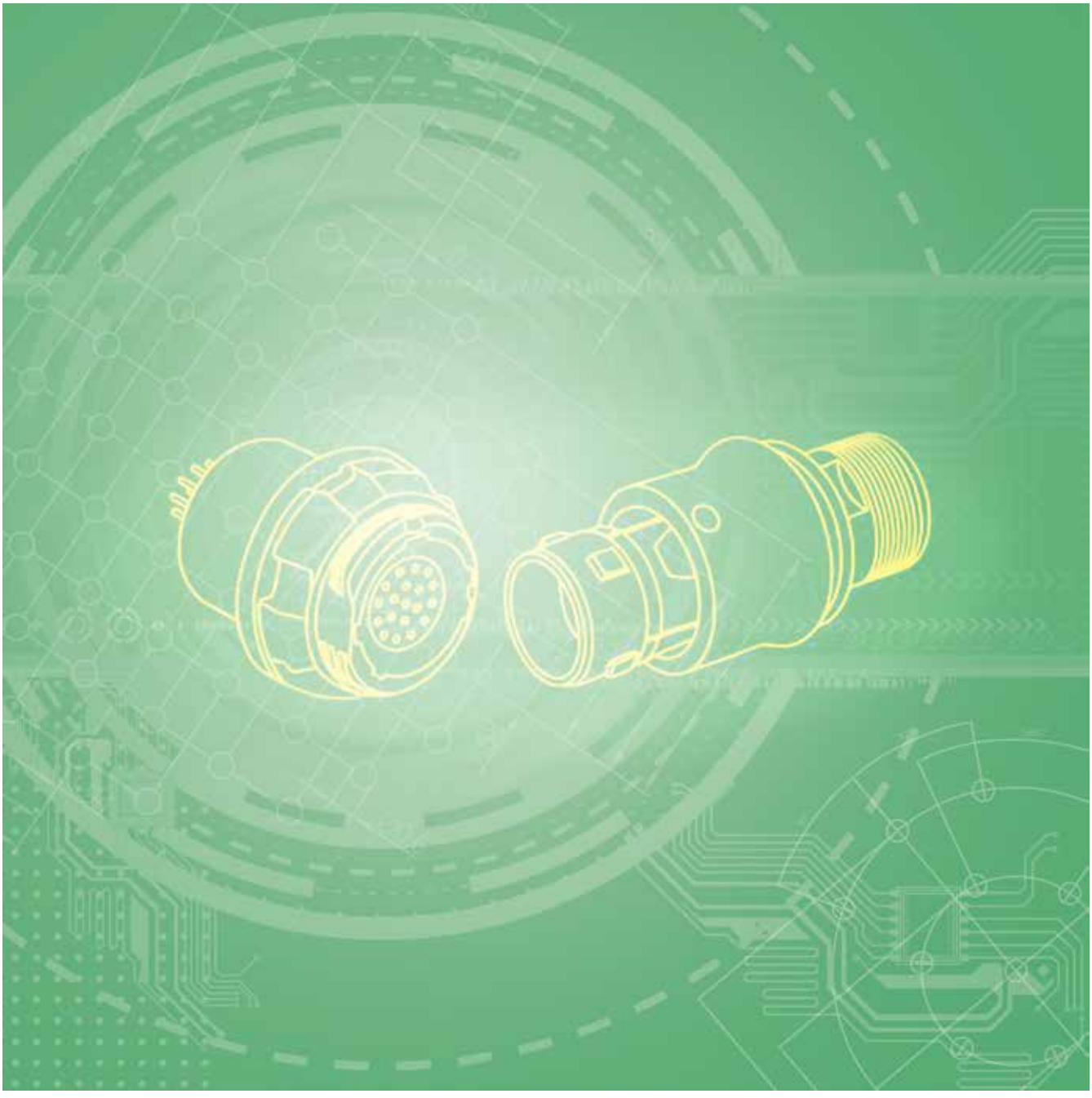
Technical Data



Operating voltage acc. to SAE AS 13441-Method 3001.1

SAE AS 13441-method 3001.1 is complied with MIL-Std, 1344-method 3001.
Data listed in the table is acc. to IEC 60512. The test voltage is applied to the pin side, and it is tested in the mating condition. 75% of the measured breakdown voltage is regarded as the basis for calculation. 1/3 of this value is the operating voltage. All the tests are performed in the standard environment (room temperature), which are also applicable to the environment at 2,000m. If any test condition varies, correct it in accordance with the related standards.

Test voltage = breakdown voltage ×0.75 operating voltage = breakdown voltage ×0.75 × 0.33

Note: For various electrical equipment, the safety factor regarding the operating voltage will be stricter. In such applications, the most important related factors are clearance and creepage distance.

Insulation class, operating voltage and test voltage of Series X, A and Y

The insulation resistance complies with DIN VDE 0110T1/2.79
The class division depends on external environmental and operational conditions

Example:
When to be used in the workshop or lab, please see the operating environment B and A respectively
Class A0: Constant-temperature , dry, weak current operating environment
Class A: Constant-temperature and dry operating environment
Class B: General office and living environment
Class C: General natural environment.
Class D:

For the harsh natural environment, such as dust, water, rain, snow, etc., there is no protection. The operating voltage is calculated from the test voltage in accordance with VDE0627

The following description explains how to calculate the operating voltage from the test voltage
Voltage value: (In actual use, the nominal voltage, rated voltage and reference voltage refer to the same concept)
The actual operating voltage is usually less than the nominal voltage

Example:
When the connector is used in a clean workshop (namely, the environmental Class B), its test voltage is 1, 000VAC. The operating voltage of the connector is 150VDC (the bold part below) according to Table 3 below.

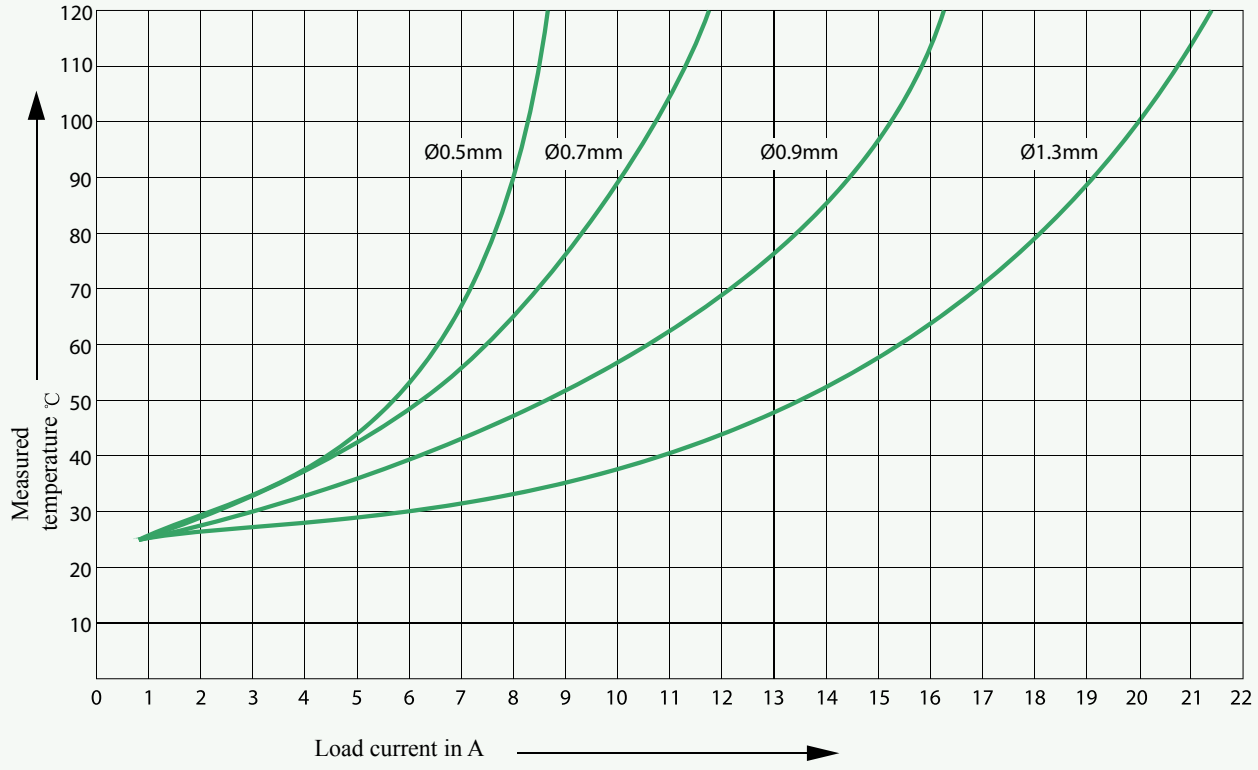
Note: The test voltage can be much higher in accordance with the standard MIL-STD-1344, Method 3001.

Table 3 (extract from DIN VDE 0627)

Reference voltage/operating voltage (V)		Test voltage (V,AC50HZ)				
DC voltage	AC voltage (V)	A0	A	B	C	D
15	12	375	500	750	875	1250
36	30	500	500	750	1000	1500
75	60	500	625	875	1000	1500
150	125	625	750	1000	1250	1750
300	250	750	875	1250	1750	2250
450	380	875	1000	1750	2250	3000
600	500	1000	1250	2000	2750	3500
800	600	1250	1750	2500	3500	4000
900	750	1500	1750	2750	3500	4500
1200	1000	1750	2250	3500	4500	5500

Operating current - pin/socket

Operating current of a single pin/socket (nominal diameter: 0.5mm-1.3mm)



Derating factor

Number of pins	Derating factor
5	0.75
7	0.65
10	0.55
14	0.50
19	0.45
24	0.40

The maximum operating temperature of the pin/socket is 120℃
The tested pin/socket is connected to the wire with the maximum allowed cable cross section. The multi-core cable or connector will generate more heat than the single-pin connector. Therefore,a derating factor must be considered. The derating factor of the connector is defined in accordance with the derating of DIN 57298 part4/VDE 0298 part2; calculate the degradation factor starting from 5-pin (refer to DIN 41640 T3).

Housing material and surface treatment

The housing material of BIX push-pull connector is copper alloy (Brass) with chrome and black chrome plating on the nickel base or can be nickel-plated as required.

Part	Materials	Surface plating
Housing Back nut Slotted nut	Copper alloy	Copper Nickel Matt chrome
Cable clamp EMI ring Half plate Anti-slip gasket Hex nut Thickness adjustment ring	Copper alloy	Matt nickel
Pin (Solderingand PCB) Socket (Solderingand PCB)	Copper alloy	Nickel Gold

Insulator materials

	Standard	Unit	PBT	PTFE	PEEK
Electrical strength	DIN 53481	KV/mm	30	>50	19
Operating temperature	--	℃	-40/+140	-100/+260	-50/+250
Flame retardant rating	UL94	--	V-0	V-0	V-0
Creepage distance	IEC60112	(V)	275	600	175

Test standard, Series F, B and I

Definition	Standard
High temperature	GJB 1217A-2009 / MIL-STD 810F/PV 501
Low temperature	GJB 1217A-2009 / MIL-STD 810F/PV 502
Temperature fluctuation	GJB 1217A-2009 / MIL-STD 810F/PV 503
Humidity	GJB 1217A-2009 / MIL-STD 810F/PV 507
Salt mist	GJB 1217A-2009 / MIL-STD 810F/PV 509 and MIL-STD 810F/PV 5071344A/Methode 1001.1
Impact	GJB 1217A-2009 / MIL-STD 810F/PV 516
Vibration	GJB 1217A-2009 / MIL-STD 1344 A / Methode 2005.1/IV
Water-proof IP68	GJB 1217A-2009 / IEC 60529

Technical parameters of Series X and A

Environmental test

Test type	Performance	Test standard
Waterproof test	IP68 IP69K	IEC 60529 / MIL-STD-810F 5811.4/5 DIN 40050-9
Dust-proof test	Dust (sand) Dust precipitation	MIL-STD-810F 510.4/5 Procedure I / II DIN 40050-9 / IP6kx
Operating temperature test	–51℃ ~ +125℃	IEC 60512-6-11 i+j
Operating temperature test	–65℃ ~ +150℃	EIA 364-32-E IEC 60068-2-14
Humidity cycle test	85 % ~ 95 %, 28 ~ 71℃	MIL-STD-1344A Method 1002.2 Type III IEC 60068-2-38
Low pressure(rapid decompression)	59.1 kPa ~ 18.8 kPa	AECTP 300, 312 Procedure III (STANAG 4370)
Low-pressure test	57.2 kPa -55℃	MIL-STD-810F 500.4/5 IEC 60068-2-40
Low-pressure test	Low-pressure test	MIL-STD-810F 521.2/3
Corrosion resistance test	96h salt mist 5% concentration, 35℃	EIA-364-26B STANAG 4370, AECTP 300-309 MIL-STD-810F 509.4/5
Mould resistance test	European fungus	IEC 60068-2-10
solar radiation proof test		60068-2-5
Chemical resistance test	A number of chemicals	ISO 16750-5

Mechanical test

Test type	Performance	Test standard
Mechanical life	5,000 mating cycles	IEC60512-5-9-a EIA-364-09
Vibration		MIL-STD1344Method2005 EIA-364-28
Impact	300g gravity acceleration 3ms half cosine pulse ＞ 1us, continuous	MIL-STD1344 Method2004 EIA-364-27

Electrical test

Electrical test	Performance	Test
Contact resistance After 5,000 mating cycles	standard Pin diameter/ contact resistance 0.5 mm < 5 mΩ 0.7 mm < 4 mΩ 0.9 mm < 4 mΩ 1.3 mm < 3 mΩ 2.0 mm < 3 mΩ	IEC 60512-2-1
Housing resistance	< 5mΩ	IEC 60512-2-1
Insulation resistance	> 100MΩ	IEC 60512-3-1
Shielding property	> 65 dB	VG 95214-11
Withstand voltage		SAE 13441

Housing material and surface treatment of Series X and A

Part	Materials	Surface plating	Flame retardant rating
Housing (conductive part)	Aluminium AlMgSiSn1Bi	Chrome plating	
Housing/nut (non-conductive part	Aluminium AlMgSiSn1Bi	Anode oxidation treatment	
Back nut (push-pull plug	Aluminium AlMgSiSn1Bi	Chemical nickel ruthenium plating	
Back nut (Break away plug and non-fixed receptacle	Aluminium AlMgSiSn1Bi	Chemical nickel	
EMI ring	CuBe2	Nickel plating	
Crimping sleeve	CuZn38Pb1,5	Nickel plating	
Color ring	PSU		UL94(V0)
Insulator	PEEK		UL94(V0)
Pin	Copper alloy	Nickel plating and gold plating	
Socket	Copper alloy	Nickel plating and gold plating	
0-ring	FVMQ(floursilikon)		
Potting glue	Potting compound		UL94(V0)
Injection material	TPU		UL94(HB)
shrinking tube	Polyester-elastomeer		Acc to.VG95343

Technical parameters of Series Y

Environmental test

Test type	Performance	Test standard
Waterproof test	IP68 IP69K	IEC 60529 / MIL-STD-810F 5811.4/5 DIN 40050-9
Dust-proof test	Dust (sand) Dust precipitation	MIL-STD-810F 510.4/5 Procedure I / II DIN 40050-9 / IP6kx
Operating temperature test	–51℃ ~ +125℃	IEC 60512-6-11 i+j
Temperature fluctuation	–65℃ ~ +150℃	EIA 364-32-E IEC 60068-2-14
Humidity cycle test	85 % ~ 95 %, 28 ~ 71℃	MIL-STD-1344A Method 1002.2 Type III IEC 60068-2-38
Low pressure(rapid decompression)	59.1 kPa ~ 18.8 kPa	AECTP 300, 312 Procedure III (STANAG 4370)
Low pressure test	57.2 kPa -55°C	MIL-STD-810F 500.4/5 IEC 60068-2-40
Anti-freezing test	6mm ice layer	MIL-STD-810F 521.2/3
Corrosion resistance test	96h salt mist 5 % concentration, 35℃	EIA-364-26B STANAG 4370, AECTP 300-309 MIL-STD-810F 509.4/5
Mould resistance test	European fungus	IEC 60068-2-10
Solar radiation proof test		60068-2-5
Chemical resistance test	A number of chemicals	ISO 16750-5

Mechanical test

Test type	Performance	Test standard
Mechanical life	5,000 mating cycles	IEC60512-5-9-a EIA-364-09
Vibration		MIL-STD1344Method2005 EIA-364-28
Impact	300g gravity acceleration 3ms half cosine pulse, > 1us, continuous	MIL-STD1344 Method2004 EIA-364-27

Electrical test

Test type	Performance	Test standard
Contact resistance (After 5,000 mating cycles)	Pin diameter/contact resistance Ø0.6mm pogo pin < 20mΩ	IEC 60512-2-1
Housing resistance	< 10mΩ	IEC 60512-2-1
Insulation resistance	> 100MΩ	IEC 60512-3-1

Housing material and surface treatment of Series Y

Part	Materials	Surface plating	Flame retardant rating
Housing (conductive part)	Aluminium AlMgSiSn1Bi	Chrome plating	
Nut	Aluminium AlMgSiSn1Bi	Anode oxidation treatment	
Back nut	Aluminium AlMgSiSn1Bi	Chemical nickel	
EMI ring	Stainless steel	Gold plating	
Crimping sleeve	CuZn38Pb1,5	Nickel plating	
Color ring	PSU		UL94(V0)
Insulator	PEEK/PBT/PCT		UL94(V0)
Pin	Copper alloy,Cube,steel	Nickel plating and gold plating	
Socket	Copper alloy	Nickel plating and gold plating	
O-ring	FVMQ(floursilikon)		
Potting glue	Potting compound		UL94(V0)
Injection material	TPU		UL94(HB)
Shrinking tube	Polyester-elastomeer		Acc to.VG95343

AWG and metric conversions

Conversion Table AWG /mm²

AWG	Circular cable				
	Diameter Inch	Diameter mm	Cross-section area mm²	Weight kg/ km	Maximum impedance Ω/km
10 (1)	0.1020	2.5900	5.2700	47.000	3.45
10 (37/26)	0.1090	2.7500	4.5300	43.600	4.13
12 (1)	0.0808	2.0500	3.3100	29.500	5.45
12 (19/25)	0.0895	2.2500	3.0800	28.600	6.14
12 (37/28)	0.0858	2.1800	2.9700	26.300	6.36
14 (1)	0.0641	1.6300	2.0800	18.500	8.79
14 (19/27)	0.0670	1.7000	1.9400	18.000	9.94
14 (37/30)	0.0673	1.7100	1.8700	17.400	10.50
16 (1)	0.0508	1.2900	1.3100	11.600	13.94
16 (19/26)	0.0551	1.4000	1.2300	11.000	15.70
18 (1)	0.0403	1.0200	0.8200	7.320	22.18
18 (19/30)	0.0480	1.2200	0.9600	8.840	20.40
20 (1)	0.0320	0.8130	0.5200	4.610	35.10
20 (7/28)	0.0366	0.9300	0.5600	5.150	34.10
20 (19/32)	0.0384	0.9800	0.6200	5.450	32.00
22 (1)	0.0252	0.6400	0.3240	2.890	57.70
22 (7/30)	0.0288	0.7310	0.3540	3.240	54.80
22 (19/34)	0.0307	0.7800	0.3820	3.410	51.80
24 (1)	0.0197	0.5000	0.1960	1.830	91.20
24 (7/32)	0.0230	0.5850	0.2270	2.080	86.00
24 (19/36)	0.0252	0.6400	0.2400	2.160	83.30
26 (1)	0.1570	0.4000	0.1220	1.140	147.00
26 (7/34)	0.0189	0.4800	0.1400	1.290	140.00
26 (19/38)	0.0192	0.4870	0.1500	1.400	131.00
28 (1)	0.0126	0.3200	0.0800	0.716	231.00
28 (7/36)	0.0150	0.3810	0.0890	0.813	224.00
28 (19/40)	0.0151	0.3850	0.0950	0.931	207.00
30 (1)	0.0098	0.2500	0.0506	0.451	374.00
30 (7/38)	0.0115	0.2930	0.0550	0.519	354.00
30 (19/42)	0.0123	0.3120	0.0720	0.622	310.00
32 (1)	0.0080	0.2030	0.0320	0.289	561.00
32 (7/40)	0.0094	0.2400	0.0350	0.340	597.10
32 (19/44)	0.0100	0.2540	0.0440	0.356	492.00
34 (1)	0.0063	0.1600	0.0201	0.179	951.00
34 (7/42)	0.0083	0.2110	0.0266	0.113	1,491.00
36 (1)	0.0050	0.1270	0.0127	0.072	1,519.00
36 (7/44)	0.0064	0.1630	0.0161	0.130	1,322.00
38 (1)	0.0040	0.1000	0.0078	0.072	2,402.00
40 (1)	0.0031	0.0800	0.0050	0.043	3,878.60
42 (1)	0.0028	0.0700	0.0038	0.028	5,964.00
44 (1)	0.0021	0.0540	0.0023	0.018	8,660.00

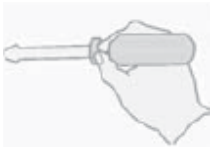
AWG=American Wire Gauge (AWG)

The AWG system is based on the rule that the cross-section of the wire changes by 26% from one to the next. The larger the cable diameter is, the smaller the gauge number is. Namely, the cable size increases while the gauge number decreases. Most of the cable adopts the stranded-conductor structure. Compared with the solid-core cable, the cable with the stranded-conductor structure is connected more durably and firmly with better bending performance and anti-vibration property. Stranded conductors consist of larger cable cores with the smaller diameter (larger gaugeNo.). The stranded-conductor structure cable has the same gauge number as the solid-core cable of the same size. The cross-section area of the stranded-conductor cable equals to the cross-section area sum of the single-stranded cable forming the entire cable.

International protection class (IP) DIN EN60 529, according to IEC 60529, GB 700-86, GB4208

Meaning of the protection class code IP □ □

Dust-proof — Water-proof

Characteristic number	Protection class	Brief description	Characteristic number	Protection class	Description
0		No protection	0		No protection
1		Protect against Large solid bodies with Ø < 50mm	1		Vertical water-drips protection
2		Protect against solid bodies with Ø > 12.5mm	2		Up to 15-degree water-drips protection
3		Protect against solid bodieswith Ø>2.5mm	3		Up to 60-degree water-drips protection
4		As 3 howeverØ> 1.0mm	4		Protection against splashed water from all directions
5		Full protection against contact. Protection against interior detrimen-tal dust deCoding	5		Protection against water spray from all directions
6		Total protection against contact. Protection against intrusion of dust	6		Protection against temporary flooding
			7		Protection against temporary immersion
			8		Protection against water pressure

IP69K is not covered within EN60529 and IEC60529 standards, but defined in DIN40509

13. Safety use notice

Hot plugging, also called plugging under load, refers to the breakdown arc formed due to current interruption on load, which may cause the contact derating. Generally, BIX prohibits hot plugging of the connector, but we can provide hot-plug connectors.