CCC, CB, CE

Miniature Circuit Breaker

MB8Z-125 series

1 Application

- Short-circuit protection
- Over-load protection
- Isolation

MB8Z-125 series products are mainly used in telecommunications equipment rooms or communication cabinets, as isolation, short circuit and overload protection for cabinets, equipment rooms or downstream subscriber lines.

2 Product Pictures

MB8Z-125 breaker

3 Model and implication

MB8 Z – 125 / 125

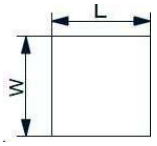
MB8: Design number

Z: Intelligent type

125: Frame current 125A

125: Rated current 125A

4 Main technical parameters

Parameter name	Specific parameter description	Parameter name	Specific parameter description
Model	MB8Z-125	Rated voltage（V）	DC60/80V
Rated short-circuit breaking capacity	Icu=Ics=10kA	Electrical endurance（times）	10000
Frame current	125A	Rated current	125A
Wiring area（mm^2）	Bare wire: 25~35; Ferrule with plastic sleeve: 10~25; Ferrule without plastic sleeve: 35; The schematic diagram of the ferrule's cross-sectional area is as follows:  Cross-sectional area of ferrule: L≤10 mm，W≤7 mm Insulation sleeve or heat shrinkable tube diameter ≤12.5mm when ferrul is inserted into 26 mm depth.	Mechanical life（times）	20000
Plug depth（mm）	24~25	Stripping length（mm）	$10mm^2$: 14~18 16~$35mm^2$: 18±1
Insertion frame force (N)	≤160	Pull out frame force (N)	≤ 150
Circuit breaker insertion and removal times	≥200	Cold pressed end length(mm)	$10mm^2$: 12~16 16~$35mm^2$: 16±1
Poles	1P+N (Positive through)	Internal resistance(mΩ)	Negative terminal ≤ 0.7, positive terminal ≤ 0.4
Terminal screw torque	2.0 N.m		

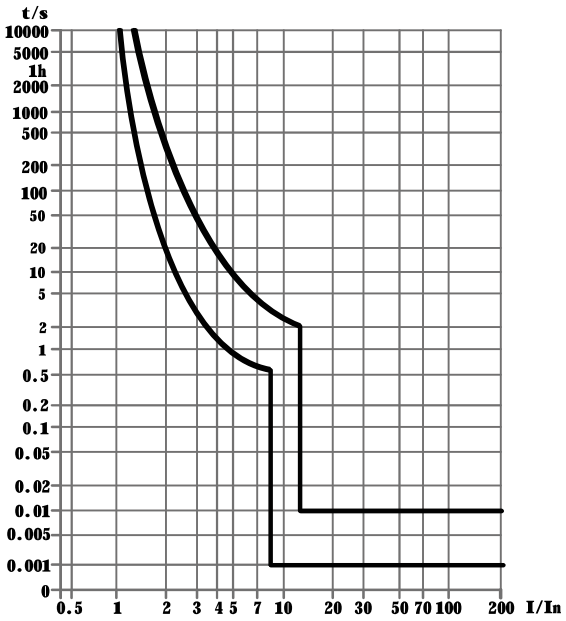
5 Working conditions

- Height ≤2000m, provide derating parameters at more than 2000 meters
- Ambient temperature: -40℃~+70℃
- Can withstand the effects of humid air (Temperature @+40℃ and above, air relative humidity does not exceed 50%, allows greater relative humidity at lower temperatures, for example, 95% @ +20℃)
- Can withstand salt spray for 48 hours
- The pollution level of the installation site is level 3
- Plug-in design: The thickness of the rear-end plug-in copper bar is 2±0.1mm, and the thickness of the communication plug interface PCB board is 1.6±0.1mm
- Product design meets RoHs
- Screwless clamping (universal clamps; standard tools are required to open the clamp before inserting or removing the wire).

6 Instantaneous tripping

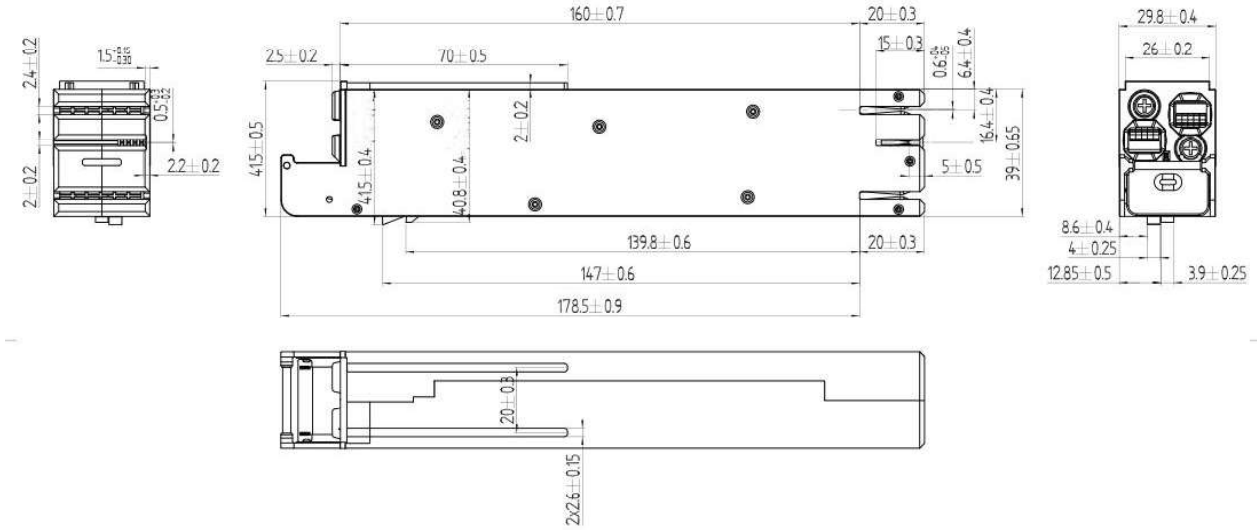
Instantaneous trip characteristic	Electromagnetic: 11Inm ± 20%; Trip time t < 0.2 s.
	Electrical: Trip protection is activated when the input current exceeds 6In and the duration reaches 640 ms.
Electronic reverse-time protection	Electronics: The device operates normally when the input current is less than 1.13Ir. When the input current exceeds 1.13Ir, energy accumulation begins. When the accumulated energy reaches [(1.5Ir)² × Tr], a trip protection is executed.
Time-delay protection characteristics	Electronics: By setting Ir and Tr, the system triggers a trip protection when the loop current exceeds the threshold current and remains above that level for longer than the delay time.
Note: ① Inm: Frame current ② Ir: Overcurrent protection threshold: Default is rated current ③ In: Rated current ④ Electronic instantaneous trip protection: 640 ms is the electronic delay time for decision-making; this does not include the time required for the motor to actuate ⑤ Tr: Overcurrent protection delay time (default: 60 s) ⑥ Overcurrent protection offers two protection characteristics: inverse-time and fixed-time. Customers can select the desired option; the default is inverse-time protection	

Instantaneous tripping range



DC: Instantaneous tripping range 11In(1±20%)

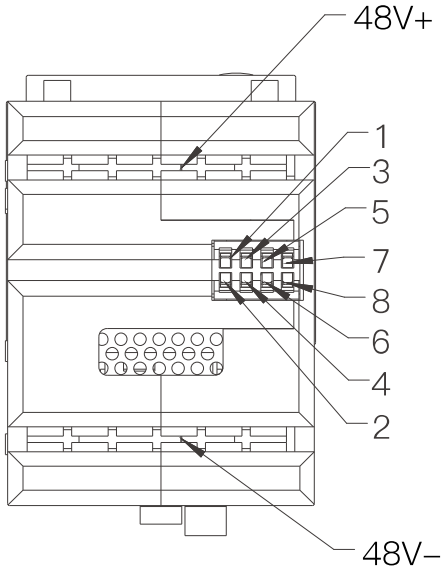
7 Outline and installation dimensions



MB8Z-125 Outline and installation dimensions

8 Installation method

1: Power supply+;	2: Power supply+;	3: Group address pin;	4: Inter group address pin;
5: Reserved;	6: Reserved;	7: 485+;	8: 485-;



9 Function description

Measure-ment	Voltage	Measures input and output voltage with an accuracy of 0.5%; data display range: 0~300V DC (software display range, not the hardware measurement range)
	Current	Measures circuit current with an accuracy of 1%; data display range: -300~300A DC
	Power	Measures output power with an accuracy of 1%
	Electric energy	Accumulates electric energy with a Class 1 accuracy; data is saved every hour or when the cumulative energy reaches 1kW·h; display range: 0~700000kW·h
	Group address	Integer value of 1~12, determined by voltage range, voltage collection accuracy of 0.5%
	Intra-group address	Integer value of 1~10, determined by voltage range, voltage collection accuracy of 0.5%
	Calibration	Factory calibration, voltage calibration, current calibration, address calibration
Indicator	Open indication	Green light always on
	Close indication	Red light always on
	Unauthorized indication	Yellow light always on
	Communication interruption indication	Blue light always on
	Alarm indication	Corresponding color light flashes once per second
	Position indication	Corresponding color light flashes twice per second; single flash duration is configurable, default 20s
	Indication color priority	Blue > Yellow > Green = Red

Protection Function	Overcurrent protection	The circuit breaker trips according to the set definite-time or inverse-time protection curve when the current exceeds the overload protection threshold.
	Overcurrent protection self-recovery	If the self-recovery times of overcurrent protection are set and the current self-recovery times are less than the set value, the circuit breaker will automatically recover after the overcurrent protection tripping with an interval of the set self-recovery time. It will stop self-recovering when the recovery times reach the set value.
	Instantaneous protection	Adopts electronic and magnetic tripping dual protection with visible physical disconnection after protection actuation.
	Undervoltage protection	Enabling the undervoltage power-off function, the circuit breaker will automatically open when the detected voltage is lower than the power-off voltage and lasts for the set undervoltage protection time.
	Overvoltage protection	Enabling the overvoltage power-off function, the circuit breaker will automatically open when the detected voltage is higher than the set overvoltage value and lasts for the set overvoltage protection time.
	Overtempera-ture tripping	The circuit breaker can be set to enable terminal or internal overtemperature protection. It will automatically trip when the detected terminal or internal temperature exceeds the set overtemperature protection threshold and lasts for the set overtemperature protection delay time.
Other functions	Output power detection	The circuit breaker can detect whether the output is energized or de-energized, and the status can be uploaded.
	Address recognition	Automatically identifies its own address by detecting the voltage of signal pins 3 and 4, address range: 1~118.
	Rated current	125A for the circuit breaker.
	Position indication	1.The circuit breaker can only be closed manually or automatically with the permission of the upper computer. 2.The circuit breaker shall retain its previous authorization status after power failure or restart.
	Misoperation prevention	1.The circuit breaker cannot be closed manually or automatically if it is not fully inserted in place. 2.The circuit breaker cannot be inserted when in the closed state. 3.The circuit breaker cannot be closed manually when in the uninserted state.
	Control function	The circuit breaker's opening and closing can be controlled via remote commands.
	Remote upgrade	The circuit breaker supports remote upgrade.
	Instantaneous protection	The circuit breaker shall not be damaged if the 48V power input port is reversely connected.
Alarms	Overcurrent	Triggers an overcurrent alarm when the load current exceeds the set current.
	Terminal overtemperature	1. If the polarity of the 48V power input is reversed, the circuit breaker should not be damaged. 2. When a 125A circuit breaker is used as a battery circuit breaker, if the battery polarity in the main circuit is reversed, the circuit breaker will not close, whether operated manually or automatically.

	Internal overtemperature	Triggers an overtemperature alarm when the circuit breaker internal temperature exceeds 100℃ (overtemperature value defined by the manufacturer).
	Undervoltage	Triggers an undervoltage alarm when the detected busbar or battery side voltage is lower than the set undervoltage alarm threshold.
	Overvoltage	Triggers an overvoltage alarm when the detected busbar or battery side voltage is higher than the set overvoltage alarm threshold.
	Controller fault	Triggers a controller fault alarm if the circuit breaker self-test fails or a motor operation fault occurs.
User parameters	Overvoltage protection enable	Enable: 0x00AA; Alarm Only: 0x0077; Disable: 0x0055; Default: Alarm Only
	Overvoltage protection threshold	Range: 50V ~ 80V; Default: 58V
	Overcurrent protection	Definite-time: 0x00AA; Inverse-time: 0x0077; Alarm Only: 0x0055 Default: Inverse-time
	Overvoltage protection threshold	Range: 3A ~ Frame Current (Rated Current) Default: Frame Current
	Overvoltage protection delay time	Range: ≥0.1s Default: 3s
	Overcurrent protection delay time	Range: ≥0.1s Default: 60s
	Undervoltage protection enable	Enable: 0x00AA; Alarm Only: 0x0077; Disable: 0x0055; Default: Alarm Only
	Undervoltage protection threshold	Range: 35V ~ 47V; Default: 43V
	Terminal overtemperature protection enable	Enable: 0x00AA; Alarm Only: 0x0077; Disable: 0x0055; Default: Alarm Only
	Terminal overtemperature protection threshold	Range: 70℃ ~ 130℃ Default: 120℃
	Terminal overtemperature protection delay time	Range: ≥0.1s; Default: 3s

	On-board overtemperature protection enable	Enable: 0x00AA; Alarm Only: 0x0077; Disable: 0x0055; Default: Alarm Only
	On-board overtemperature protection threshold	Range: 70℃~100℃; Default: 100℃
	On-board overtemperature protection delay time	Range: ≥0.1s; Default: 3s
	Voltage recovery hysteresis value	Range: 1V~10V; Default: 2V
	Overcurrent auto-reclosing enable	Enable: 0x00AA; Disable: 0x0055; Default: Enable
	Overcurrent auto-reclosing delay time	Range: ≥0.1s; Default: 60s
	Overcurrent auto-reclosing times	Range: 1~5 times Default: 3 times
Communi-cation	Physical communication interface	RS485
	Communication parameters	Baud Rate: 0: 19200, 1: 9600, 2: 4800, 3: 2400, 4: 1200; Parity: 0: None, 2: Even, 4: Odd; Stop Bit: 0: 1 bit, 1: 2 bits; Default: 9600bps, No Parity, 1 Stop Bit
	Network formation	Address identification by voltage, self-networking, maximum access capacity: 64 units
	Protocol	MODBUS Protocol

10 Derating factor table

10.1 Table of derating factors for plastic case circuit breakers above 2000m altitude.

Altitude (km)	Working current	Working voltage	Power-frequency withstand voltage	Uimp	Short circuit breaking capacity and electrical life
2	In	Ue	1.00	1.00	1.00
3	0.99In	Ue	0.89	0.89	0.83
4	0.96In	Ue	0.80	0.80	0.71
5	0.94In	Ue	0.73	0.73	0.63

10.2 When the ambient temperature changes, the relationship between the current correction factor and temperature is as follows.

Rated current	Rated current correction factor											
	-40℃	-30℃	-20℃	-10℃	0℃	10℃	20℃	30℃	40℃	50℃	60℃	70℃
125A	1	1	1	1	1	1	1	1	1	0.91	0.82	0.72

11 Installation and maintenance

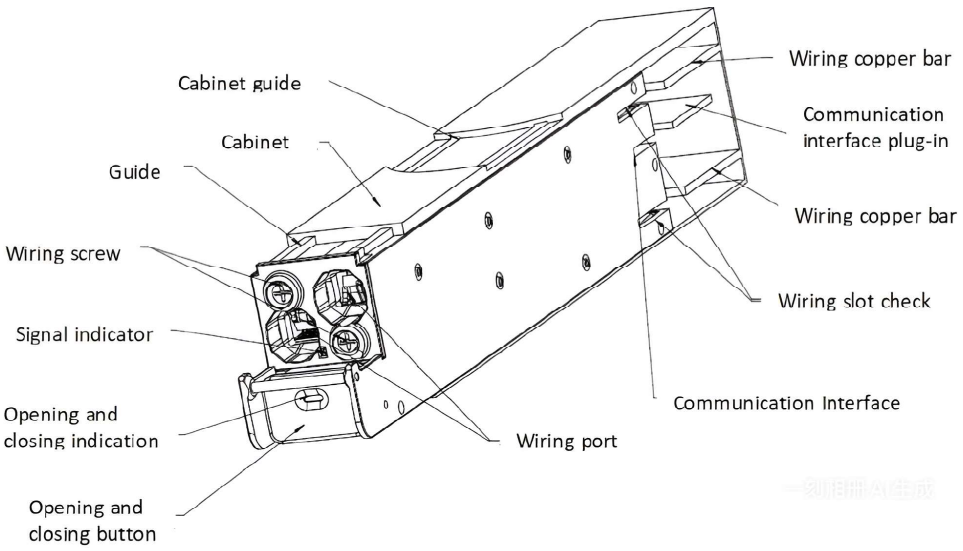
11.1 After unpacking, the user must check whether the equipment is in good condition, whether the leaking metal parts are rusted, and whether the product is defective due to poor transportation and storage. If the above phenomenon occurs, the product cannot be used, please contact the supplier in time to solve.

11.2 Check whether the technical parameters on the product shell meet the requirements for use.

11.3 Installation operation and precautions:

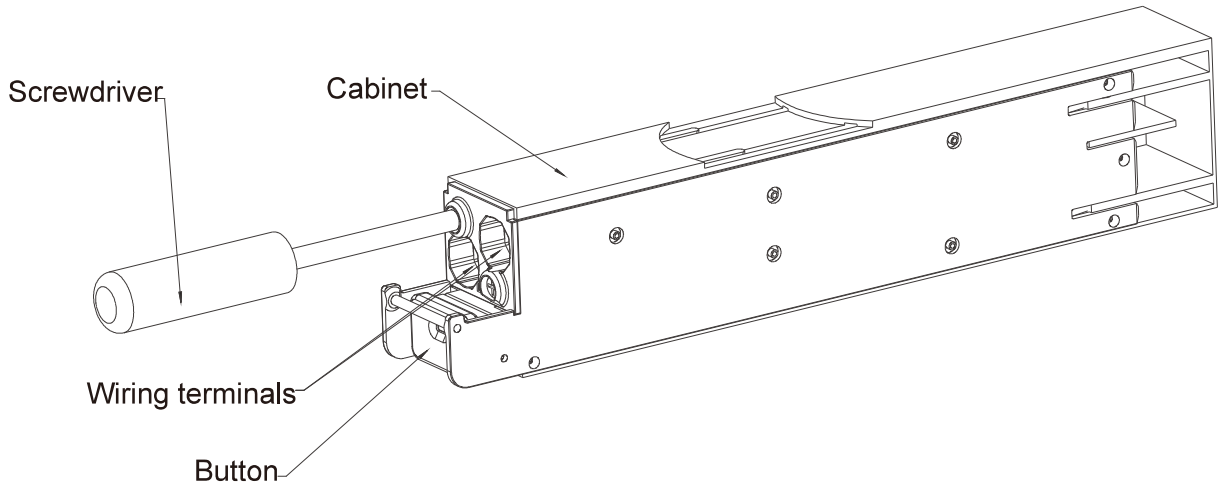
1) Before inserting the circuit breaker into the cabinet, make sure that the circuit breaker is in the open state (otherwise, it cannot be completely inserted into the cabinet);

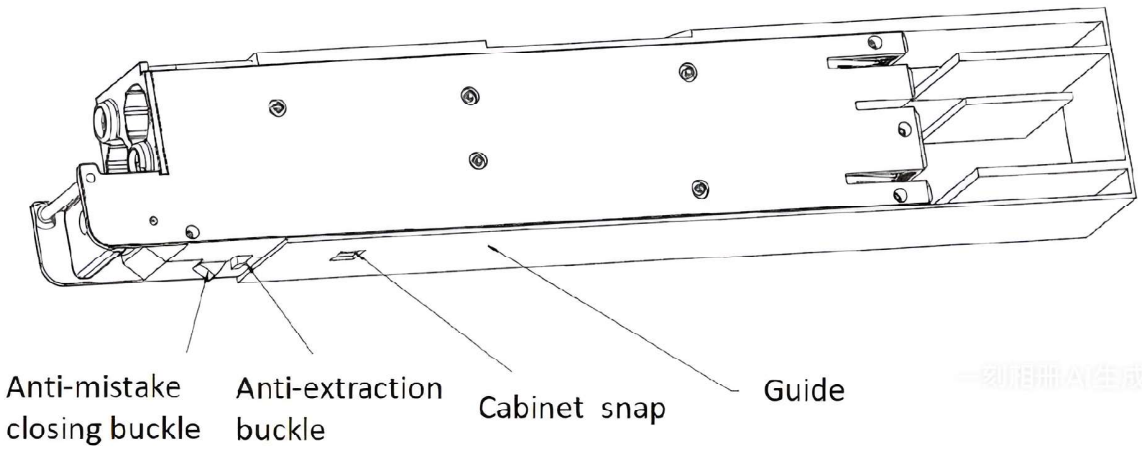
2) Insert the guide rails on both sides of the circuit breaker along the cabinet guide rails, and push the circuit breaker into the cabinet as shown in the figure below;



3) As shown in the figure below, after the circuit breaker is completely inserted into the cabinet, the circuit breaker buckle will protrude from the card slot of the cabinet; Before connecting the front-end cable, use a screwdriver to unscrew the set screw, and then insert the cable of the corresponding specification into the cable interface, then the screwdriver tightens the set screw, the cable is clamped, and the front-end cable connection is completed;

As shown in the figure below, the circuit breaker has just been inserted into the cabinet (simplified) state view





4) Press the button to close the circuit breaker, pull out the button to open the circuit breaker;

5) When the circuit breaker needs to be taken out, first open the circuit breaker, use a screwdriver to unscrew the screw from the front terminal to take out the cable, and then continue to pull the button (the buckle is automatically unlocked), the rear copper bar of the circuit breaker is separated, and the circuit breaker removed from the cabinet.

Note:

Plug-in installation, the thickness of the rear-end plugged copper bar is 2±0.1mm, and the thickness of the copper bar of the communication signal port is 1.6±0.1mm;

a) The overload characteristic of this circuit breaker is set by the manufacturer and cannot be adjusted at will during use to avoid affecting the performance.

b) The cross-sectional area of the connecting conductor is compatible with the rated current of the circuit breaker (see the table below)

Rated current (A)	125
Conductor cross section (mm^2)	35

ANNEX:

I. Principle

The intelligent circuit breaker realizes the identification of group address and intra-group address through Pin 3 and Pin 4 of the 8-pin terminal at its rear end. The address identification is achieved by detecting the voltage values of the two signal pins to determine the address values, and the communication ID is determined based on the combination of address values.

The maximum group address is 12 and the maximum intra-group address is 10. The voltage signals for both group address and intra-group address are obtained through voltage division by series-connected 2kΩ resistors. Specifically, the group address circuit consists of 12 series-connected 2kΩ resistors connected to DC48V, and the intra-group address circuit consists of 10 series-connected 2kΩ resistors connected to DC48V.

II. Address Corresponding Relations

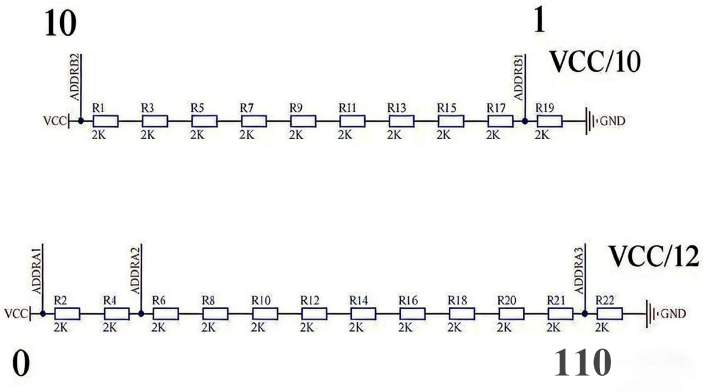
Group address: A voltage value equivalent to 1/12 of DC48V represents address 12; A voltage value equivalent to 12/12 of DC48V represents address 1.

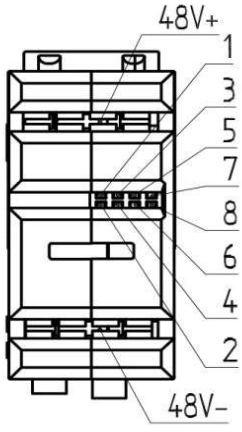
Intra-group address: A voltage value equivalent to 1/10 of DC48V represents address 1; A voltage value equivalent to 10/10 of DC48V represents address 10.

Communication ID = (Group address - 1) × 10 + Intra-group address

Examples: Group address = 1, internal address = 5, i.e., communication ID = 5; Group address = 1, internal address = 10, i.i.e., communication ID = 10; Group address = 6, internal address = 5, i.e., communication ID = 55; Group address = 7, internal address = 10, i.e., communication ID = 70;

III. Schematic Diagram of Address Sc





1: Power supply+;
2: Power supply+;
3: Group address pin;
4: Inter group address pin;
5: Reserved;
6: Reserved;
7: 485+;
8: 485-;