

## Product Datasheet - Technical Specifications



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# 5 Technical Specification

This chapter will introduce the main technical parameters of this power, such as rated voltage/current/power and so on. Besides, we will introduce the working environment and storage temperature.

- ◆ Main Specification
- ◆ Supplemental Characteristics

## 5.1 Main Specification

### 5.1.1 IT-M3223

Parameter		IT-M3223 V1.0	
Rated value (0 °C-40 °C)	Voltage	0 - 60V	
	Current	0 - 10 A	
	Power	100 W	
Load Regulation	Voltage	$\leq 0.01\% + 5\text{mV}^3$	
$\pm(\% \text{ of Output} + \text{Offset})$	Current	$\leq 0.05\% + 2\text{mA}$	
Line Regulation	Voltage	$\leq 0.02\% + 3\text{mV}$	
$\pm(\% \text{ of Output} + \text{Offset})$	Current	$\leq 0.05\% + 1\text{mA}$	
Setup Resolution	Voltage	1mV	
	Current	1mA	
	OVP	0.1V	
Read Back Resolution	Voltage	1mV	
	Current	10A Range	1mA
		20mA Range	1 $\mu\text{A}^4$
100 $\mu\text{A}$ Range		10nA <sup>4</sup>	
Setup Accuracy	Voltage	$\leq 0.03\% + 12\text{mV}^5$	
(within 12 months, 23°C $\pm$ 5°C)	Current	$\leq 0.05\% + 5\text{mA}$	
$\pm(\% \text{ of Output} + \text{Offset})$	OVP	$\leq 0.1\% + 0.2\text{V}$	
Read Back Accuracy	Voltage	$\leq 0.03\% + 8\text{mV}$	

Parameter		IT-M3223 V1.0	
( within 12 months, 23°C±5° C)  ±(%of Output+Offset)	Current	10A Range	≤0.05% + 5mA
		20mA Range	≤0.05% + 20uA <sup>1</sup>
		100uA Range	≤0.05% + 100nA <sup>1</sup>
Ripple	Voltage	Typical ≤ 8mVp-p , ≤ 1mV rms	
(20Hz -20MHz)	Current	≤3mArms	
Setup Temperature Coefficient	Voltage	0.005% + 0.5mV	
±(%of Output+Offset)	Current	0.005% + 0.1mA	
Read Back Temperature Coefficient  ±(%of Output+Offset)	Voltage	0.005% + 0.5mV	
	Current	10A Range	0.005% + 0.1mA
		20mA Range	0.005% + 1 uA
		100uA Range	0.005% + 5 nA
Rise time (Fast mode, no load)	Voltage	≤ 30mS <sup>2</sup>	
Rise time (Fast mode, full load)	Voltage	≤ 30mS <sup>2</sup>	
Fall time (Fast mode, no load)	Voltage	≤ 50mS <sup>2</sup>	
Fall time (Fast mode, full load)	Voltage	≤ 10mS <sup>2</sup>	
Rise Time( full load )	Current	≤ 30mS <sup>2</sup>	
Transient Response Time	50%-100% LOAD restore to 75 mV ≤ 50uS		
Remote Sense Compensation Voltage	1V Per each lead		
Command Response Time (Typical)	5mS		
OVP response time	< 10mS		
Setup Stability-30min	Voltage	0.01% + 1mV	
±(%of Output+Offset)	Current	0.02% + 2mA	
Setup stability-8h	Voltage	0.01% + 3mV	
±(%of Output+Offset)	Current	0.05% + 3mA	

Parameter		IT-M3223 V1.0	
Readback Stability-30min ±(% of Output+Offset)	Voltage	0.01% + 1mV	
	Current	10A Range	0.02% + 3mA
		20mA Range	0.01% + 3uA <sup>1</sup>
		100uA Range	0.01% + 20nA <sup>1</sup>
Readback stability-8h ±(% of Output+Offset)	Voltage	0.01% + 5mV	
	Current	10A Range	0.05% + 3mA
		20mA Range	0.01% + 4uA <sup>1</sup>
		100uA Range	0.01% + 30nA <sup>1</sup>
AC Input	Voltage 1	110V ± 10%	
	Voltage 2	220V ± 10%	
	Frequency	47HZ - 63HZ	
Fuse	10AT ( internal )		
Power factor (Typical)	0.45 max		
Maximum Input Current	5A max		
Maximum Input Apparent Power	400VA max		
Efficiency (Typical)	75% max		
Protective Function	OVP / OCP / OTP / OPP / UVP / UCP / Foldback		
Communication (Optional)	GPIB, USB, LAN, CAN, RS232, RS485		
Analog input range (Optional)	0 – 10 Vdc		
Isolation ( output to ground)	± 240Vdc		
Working Temperature	0 ~ 40°C		
Storage Temperature	-20°C ~ 70°C		
Working humidity range	15% - 85% @40°C		
Dimension ( mm)	Overall	234±1mm(W)*57±1mm(H)*477±1mm(D)	
Weight( net)	4.5Kg		

1. Accuracy of small range current (20mA and 100uA range) is measured under CV state
2. 10% -90% FS

3. Measure with the sense connected
4. When the current measurement is in the range of 20mA and 100uA, the capacitive load of the power supply cannot exceed 47uF.
5. Voltage Setup Accuracy and Read Back Accuracy are measured when the sense is connected

## 5.1.2 IT-M3233

Parameter		IT-M3233 Specification V1.0	
Rated value (0 °C-40 °C)	Voltage	0 - 60V	
	Current	0 - 10 A	
	Power	200 W	
Load Regulation	Voltage	$\leq 0.01\% + 5\text{mV}^3$	
$\pm(\% \text{ of Output} + \text{Offset})$	Current	$\leq 0.05\% + 2\text{mA}$	
Line Regulation	Voltage	$\leq 0.02\% + 3\text{mV}$	
$\pm(\% \text{ of Output} + \text{Offset})$	Current	$\leq 0.05\% + 1\text{mA}$	
Setup Resolution	Voltage	1mV	
	Current	1mA	
	OVP	0.1V	
Read Back Resolution	Voltage	1mV	
	Current	10A Range	1mA
		20mA Range	1uA <sup>4</sup>
100uA Range	10nA <sup>4</sup>		
Setup Accuracy (within 12 months, 23°C±5°C) $\pm(\% \text{ of Output} + \text{Offset})$	Voltage	$\leq 0.03\% + 12\text{mV}^5$	
	Current	$\leq 0.05\% + 5\text{mA}$	
	OVP	$\leq 0.1\% + 0.2\text{V}$	
Read Back Accuracy (within 12 months, 23°C±5°C) $\pm(\% \text{ of Output} + \text{Offset})$	Voltage	$\leq 0.03\% + 8\text{mV}$	
	Current	10A Range	$\leq 0.05\% + 5\text{mA}$
		20mA Range	$\leq 0.05\% + 20\text{uA}^1$
100uA Range		$\leq 0.05\% + 100\text{nA}^1$	

Parameter		IT-M3233 Specification V1.0	
Ripple (20Hz -20MHz)	Voltage	Typical $\leq 8\text{mVp-p}$ , $\leq 1\text{mV rms}$	
	Current	$\leq 3\text{mA rms}$	
Setup Temperature Coefficient (% of Output+Offset)/°C	Voltage	0.005% + 0.5mV	
	Current	0.005% + 0.1mA	
Read Back Temperature Coefficient (% of Output+Offset)/°C	Voltage	0.005% + 0.5mV	
	Current	10A Range	0.005% + 0.1mA
		20mA Range	0.005% + 1 $\mu\text{A}$ <sup>1</sup>
		100 $\mu\text{A}$ Range	0.005% + 5 nA <sup>1</sup>
Rise time (Fast mode, no load)	Voltage	$\leq 30\text{mS}^2$	
Rise time (Fast mode, full load)	Voltage	$\leq 30\text{mS}^2$	
Fall time (Fast mode, no load)	Voltage	$\leq 50\text{mS}^2$	
Fall time (Fast mode, full load)	Voltage	$\leq 10\text{mS}^2$	
Rise Time( full load )	Current	$\leq 30\text{mS}^2$	
Transient Response Time	50% -100% LOAD restored to 75 mV $\leq 50\mu\text{S}$		
Remote Sense Compensation Voltage	1V Per each lead		
Programming response time (typical)	5mS		
OVP response time	< 10mS		
Setup Stability-30min ( % of Output +Offset )	Voltage	0.01% + 1mV	
	Current	0.02% + 2mA	
Setup stability-8h ( % of Output +Offset )	Voltage	0.01% + 3mV	
	Current	0.05% + 3mA	
Readback Stability-30min ( % of Output +Offset )	Voltage	0.01% + 1mV	
	Current	10A Range	0.02% + 3mA
		20mA Range	0.01% + 3 $\mu\text{A}$ <sup>1</sup>
		100 $\mu\text{A}$ Range	0.01% + 20nA <sup>1</sup>

Parameter		IT-M3233 Specification V1.0	
Readback stability-8h ( %of Output +Offset )	Voltage	0.01% + 5mV	
	Current	10A Range	0.05% + 3mA
		20mA Range	0.01% + 4uA <sup>1</sup>
		100uA Range	0.01% + 30nA <sup>1</sup>
AC Input	Voltage 1	110V ± 10%	
	Voltage 2	220V ± 10%	
	Frequency	47HZ - 63HZ	
Fuse specifications	10AT (internal)		
Power factor (typical value)	0.45 max		
Maximum Input Current	8A max		
Maximum Input Apparent Power	800VA max		
Efficiency (typical)	75% max		
Protective Function	OVP / OCP / OTP / OPP / UVP / UCP / Foldback		
Communication interface (optional)	GPIB, USB, LAN, CAN, RS232, RS485		
Analog input range (optional)	0 – 10 Vdc		
Isolation ( output to ground)	± 240Vdc		
Working Temperature	0 ~ 40°C		
Storage Temperature	-20°C ~ 70°C		
Working Humidity	15% - 85% @40°C		
Dimension ( mm)	Overall	234±1mm(W)*57±1mm(H)*477±1mm(D)	
Weight( net)	4.5Kg		

- 1. Accuracy of small range current (20mA and 100uA range) is measured under CV state
- 2. 10% -90% FS
- 3. Measure with the sense connected
- 4. When the current measurement is in the range of 20mA and 100uA, the capacitive load of the power supply cannot exceed 47uF.
- 5. Voltage Setup Accuracy and Read Back Accuracy are measured when the sense is connected

### 5.1.3 IT-M3243

Parameter		IT-M3243 V1.0	
Rated value (0 °C-40 °C)	Voltage	0 - 60V	
	Current	0 - 10 A	
	Power	360 W	
Load Regulation ±(% of Output+Offset)	Voltage	≤0.01% + 5mV <sup>3</sup>	
	Current	≤0.05% + 2mA	
Line Regulation ±(% of Output+Offset)	Voltage	≤0.02% + 3mV	
	Current	≤0.05% + 1mA	
Setup Resolution	Voltage	1mV	
	Current	1mA	
Read Back Resolution	Voltage	1mV	
	Current	10A Range	1mA
		20mA Range	1uA <sup>4</sup>
		100uA Range	10nA <sup>4</sup>
Setup Accuracy (within 12 months, 23°C±5°C) ±(% of Output+Offset)	Voltage	≤0.03% + 12mV <sup>5</sup>	
	Current	≤0.05% + 5mA	
Read Back Accuracy (within 12 months, 23°C±5°C) ±(% of Output+Offset)	Voltage	≤0.03% + 8mV	
	Current	10A Range	≤0.05% + 5mA
		20mA Range	≤0.05% + 20uA <sup>1</sup>
		100uA Range	≤0.05% + 100nA <sup>1</sup>
Ripple (20Hz -20MHz)	Voltage	Typical ≤ 8mVp-p , ≤ 1mV rms	
	Current	≤3mArms	
Setup Temperature Coefficient ±(% of Output+Offset)	Voltage	0.005% + 0.5mV	
	Current	0.005% + 0.1mA	
Read Back Temperature Coefficient ±(% of Output+Offset)	Voltage	0.005% + 0.5mV	
	Current	10A Range	0.005% + 0.1mA
		20mA Range	0.005% + 1 uA <sup>1</sup>



Parameter		IT-M3243 V1.0	
		100uA Range	0.005% + 5 nA <sup>1</sup>
Rise time (Fast mode, no load)	Voltage	≤ 30mS <sup>2</sup>	
Rise time (Fast mode, full load)	Voltage	≤ 30mS <sup>2</sup>	
Fall time (Fast mode, no load)	Voltage	≤ 50mS <sup>2</sup>	
Fall time (Fast mode, full load)	Voltage	≤ 10mS <sup>2</sup>	
Rise Time( full load )	Current	≤ 30mS <sup>2</sup>	
Transient Response Time	50%-100% LOAD restore to 75 mV ≤ 50uS		
Remote Sense Compensation Voltage	1V Per each lead		
Command Response Time (Typical)	5mS		
Setup Stability-30min ±(%of Output+Offset)	Voltage	0.01% + 1mV	
	Current	0.02% + 2mA	
Setup stability-8h ±(%of Output+Offset)	Voltage	0.01% + 3mV	
	Current	0.05% + 3mA	
Readback Stability-30min ±(%of Output+Offset)	Voltage	0.01% + 1mV	
	Current	10A Range	0.02% + 3mA
		20mA Range	0.01% + 3uA <sup>1</sup>
100uA Range		0.01% + 20nA <sup>1</sup>	
Readback stability-8h ±(%of Output+Offset)	Voltage	0.01% + 5mV	
	Current	10A Range	0.05% + 3mA
		20mA Range	0.01% + 4uA <sup>1</sup>
100uA Range		0.01% + 30nA <sup>1</sup>	
AC Input	Voltage 1	110V ± 10%	
	Voltage 2	220V ± 10%	
	Frequency	47HZ - 63HZ	
Fuse	10AT ( internal )		
Power factor (Typical)	0.45 max		
Maximum Input Current	8A max		

Parameter		IT-M3243 V1.0
Maximum Input Apparent Power	1100VA max	
Efficiency (Typical)	75% max	
Protective Function	OVP / OCP / OTP	
Communication (Optional)	GPIB, USB, LAN, CAN, RS232, RS485	
Analog input range (Optional)	0 – 10 Vdc	
Isolation ( output to ground)	± 240Vdc	
Working Temperature	0 ~ 40°C	
Storage Temperature	-20°C ~ 70°C	
Working humidity range	15% - 85% @40°C	
Dimension ( mm)	Overall	234mmW*52.9mmH*476mmD
	After removing the feet, ears, etc.	214mmW*43.5mmH*450mmD
Weight( net)	4.5Kg	

- 1. Accuracy of small range current (20mA and 100uA range) is measured under CV state
- 2. 10% -90% FS
- 3. Measure with the sense connected
- 4. When the current measurement is in the range of 20mA and 100uA, the capacitive load of the power supply cannot exceed 47uF.
- 5. Voltage Setup Accuracy and Read Back Accuracy are measured when the sense is connected

## 5.2 Supplemental Characteristics

State storage capacity: 10 sets

Recommended calibration frequency: once a year

Cooling style: fans