MT9522

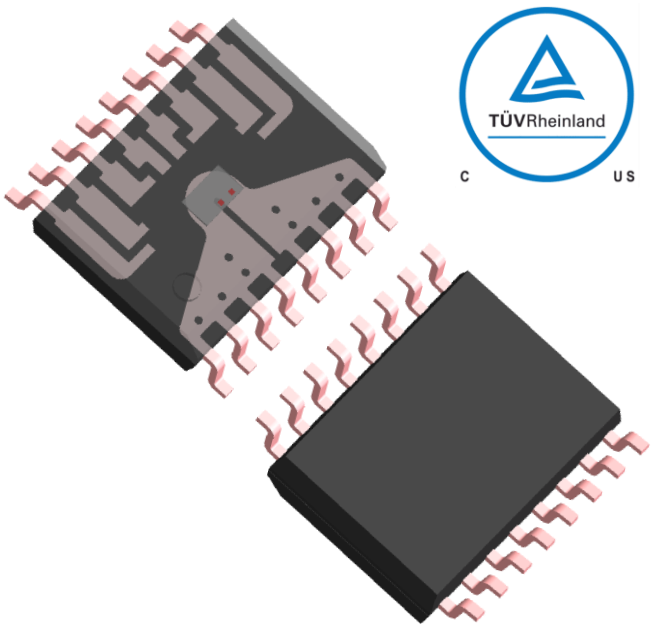
Fully Integrated, Hall Effect-Based Linear Current Sensor IC with 4.8kV High-Isolation, 250KHz, SOP-16W Package

1 Product Description

The MagnTek® MT9522 product series is a fully integrated Hall Effect-based isolated linear current sensor device family designed for AC or DC current sensing in industrial, commercial, and communications systems. Each of the MT9522 consists of a precise, low-offset, linear Hall circuit with a low-resistance current conductor path located near the surface of the die. Applied current flowing through this low-resistance current conductor path generates a magnetic field that the Hall IC converts into a proportional voltage. The current is sensed differentially in order to reject common-mode fields, improving accuracy in magnetically noisy environments. Device accuracy is optimized through the close proximity of the magnetic field to the Hall transducer.

A precise, proportional voltage is provided by the low-offset, chopper-stabilized CMOS Hall IC, which has been accurately calibrated when it is manufactured. The output of the device has a positive slope (>VOQ) when an increasing current flows through the primary current conduction path (from pins 1,2,3 and 4, to pins 5,6,7 and 8). The internal resistance of this conductive path is 0.75 mΩ typical, providing low-power loss. The terminals of the conductive path are electrically isolated from the signal leads (pins 9 through 16). This allows the MT9522 current sensor IC to be used in high-side current sense applications without use other costly isolation techniques.

The MT9522 family provides SOP-16W package to customers, The package is RoHS compliant.



Not to scale

2 Features

- AEC-Q100 Qualified
- ±0.3% Typical Linearity Over Temperature
- Fast Output Response Time: 2.2 μs (typ.)
- 250kHz Signal Bandwidth
- 5.0V/3.3V Power Supply Operation
- Output Mode Option:
  ---Ratiometric Output Proportional to Power Supply
  ---Fixed Output Out of Proportion to Power Supply
- -40℃~150℃ Operating Temperature
- Primary Conductor Resistance
  ---0.75mΩ
- Sensing Current Range: (Bidirectional or Unidirectional)
  ---±20A, ±30A, ±40A, ±50A, ±65A, ±80A, ±100A
  ---+40A, +50A
- Output Voltage Proportional to AC or DC Current
- Extremely Stable Quiescent Output Voltage
- Device with Overcurrent FAULT Function and Flexible External FAULT Threshold Setting
- Non-Ratiometric Operation with Reference Output
- Near Zero Magnetic Hysteresis
- Safety Parameters: (UL62368 CU72227126 01)
  ---4.8kVrms 1min Dielectric Surge Isolation
  ---1097Vrms, 1550V_{DC} or V_{PK} Working Voltage
  ---8.2mm Clearance Distance
  ---8.2mm Creepage Distance
- Package Option:
  ---SOP-16W
- RoHS Compliant: (EU)2015/863

3 Applications

- Inverter current sensing
- Motor phase and rail current sensing
- PV String Inverters, MPPT current sensing
- On-Board Charger
- DC-DC
- Switching Power Supplies
- Overcurrent Protection
- UPS

4 Product Overview of MT9522

Part No.	Description
MT9522WT	SOP-16W Tape & Reel (1500 pcs/bag)

Table of Contents

Reversion History

1	Originally Version	
2	Version 1.0	Add AEC-Q100 logo; cancel 30UXX, add 40UXX
3	Version 1.1	Add TUV UL62368 certificate info, update IND and other info
4	Version 2.0	Update the definition of TPO; add POR parameters; add ±100A submodel
5	Version 2.1	Update Clearance Distance

5 Functional Block Diagram

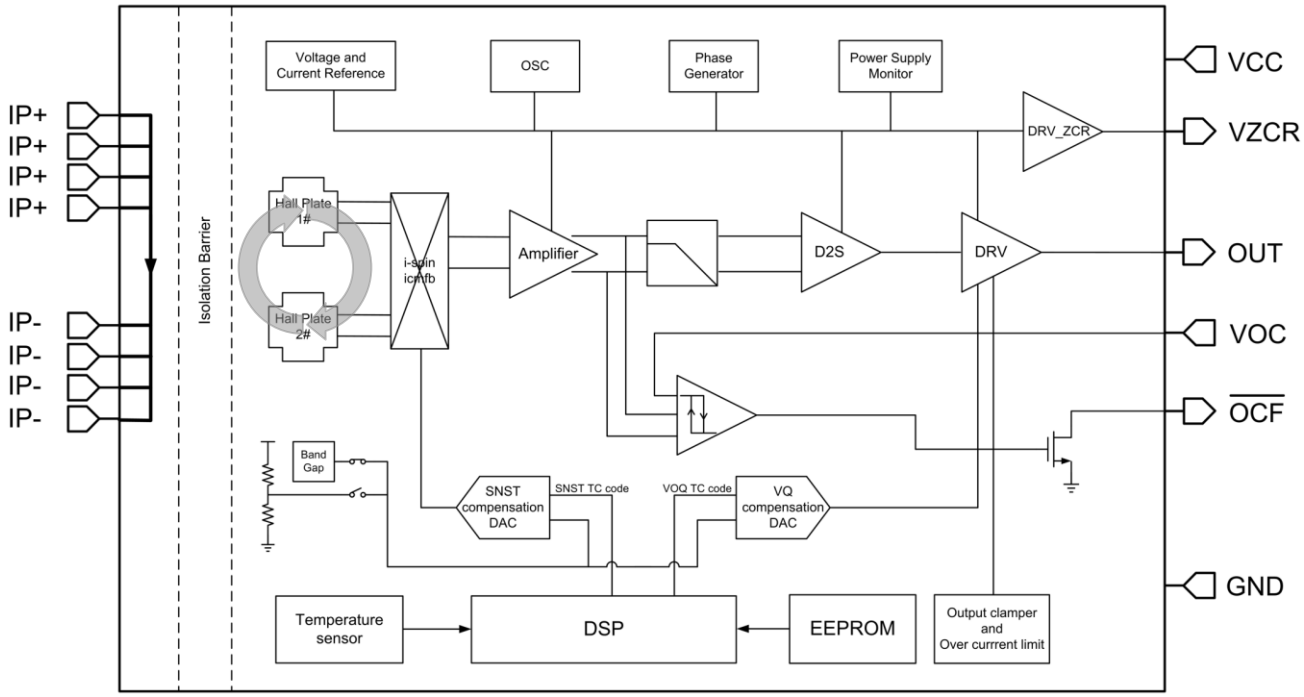
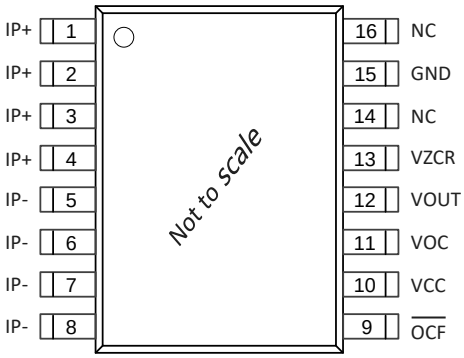


Figure.1 Functional Block Diagram

6 Pin Configuration and Functions

Top View



No.	Name	Description
1, 2, 3, 4	IP+	Input Current Positive Pin
5, 6, 7, 8	IP-	Input Current Negative Pin
9	$\overline{\text{OCF}}$	Overcurrent FAULT Output, Digital
10	VCC	Power Supply
11	VOC	Overcurrent FAULT Input, Analog
12	VOUT	Analog Output Signal
13	VZCR	Zero Current Reference Output
14	NC	No Internal Connection
15	GND	Signal Ground
16	NC	No Internal Connection

Figure.2 Pin Configuration & Functions (SOP-16W)

7 Naming Specification

Part Number MT9522 ❶ WT ❷ - 50 ❸ B ❹ F ❺ 5 ❻

❶ Series Name

❷ Package Type

Type	Package Type
WT	SOP-16W

❸ Input Current Range

Type	Input Current Range
20	Full scale sensing range: 20A
30	Full scale sensing range: 30A
40	Full scale sensing range: 40A
50	Full scale sensing range: 50A
65	Full scale sensing range: 65A
80	Full scale sensing range: 80A
100	Full scale sensing range: 100A

❹ Current Polarity

Type	Current Polarity
B	Bidirectional
U	Unidirectional

❺ Output Mode

Type	Output Mode
R	Ratiometric Output
F	Fixed Output

❻ Power Supply

Type	Power Supply
3	VCC=3.3V
5	VCC=5V

8 Selection Guide

Ordering P/N	Output Mode	VCC (V)	Current Range (A)	Sensitivity (mV/A)	Package	Qty per Reel (pcs)
MT9522WT-40UR5	Ratio	5	+40	100	SOP-16W	1500
MT9522WT-50UR5			+50	80		
MT9522WT-20BR5			±20	100		
MT9522WT-30BR5			±30	66.7		
MT9522WT-40BR5			±40	50		
MT9522WT-50BR5			±50	40		
MT9522WT-65BR5			±65	30.8		
MT9522WT-80BR5			±80	25		
MT9522WT-100BR5			±100	20		

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Selection Guide (*continued*)

Ordering P/N	Output Mode	VCC (V)	Current Range (A)	Sensitivity (mV/A)	Package	Qty per Reel (pcs)
MT9522WT-40UR3	Ratio	3.3	+40	66	SOP-16W	1500
MT9522WT-50UR3			+50	52.8		
MT9522WT-20BR3			±20	66		
MT9522WT-30BR3			±30	44		
MT9522WT-40BR3			±40	33		
MT9522WT-50BR3			±50	26.4		
MT9522WT-65BR3			±65	20.3		
MT9522WT-80BR3			±80	16.5		
MT9522WT-100BR3			±100	13.2		
MT9522WT-40UF5	Fix	5	+40	100		
MT9522WT-50UF5			+50	80		
MT9522WT-20BF5			±20	100		
MT9522WT-30BF5			±30	66.7		
MT9522WT-40BF5			±40	50		
MT9522WT-50BF5			±50	40		
MT9522WT-65BF5			±65	30.8		
MT9522WT-80BF5			±80	25		
MT9522WT-100BF5			±100	20		
MT9522WT-20BF3	Fix	3.3	±20	66		
MT9522WT-30BF3			±30	44		
MT9522WT-40BF3			±40	33		
MT9522WT-50BF3			±50	26.4		
MT9522WT-65BF3			±65	20.3		
MT9522WT-80BF3			±80	16.5		
MT9522WT-100BF3			±100	13.2		

9 Typical Application Circuit

(1) C_{BYPASS}=0.1uF, **CBYPASS between VCC and GND is necessary**; C1, C2 recommended 1nF.
(2) $\overline{OCF}$ is an open drain output. If the signal terminal is used, the pull-up resistance R_{PU}=10KΩ.
(3) The "Zero Current Reference Output" can use either single ended output or differential output to interface with ADC or OPA.
(4) The "VOC pin" is used as the analog setting input of "Overcurrent FAULT Output". The voltage of VOC pin can be set by VZCR and divider resistor.

- **For the 5V power supply version**, the device provides unidirectional or bidirectional Overcurrent FAULT function. If VOC=0.5V, the device will select the minimum trigger point I_{OCF}(min). If VOC=2V, the device will select the maximum trigger point I_{OCF}(max). For all voltages between 0.5V and 2V, an Overcurrent FAULT trigger point can be linearly selected between the minimum and maximum levels. When VOC=GND, the device will use the internal default Overcurrent FAULT threshold, I_{OCF}=1.11*IP (A).
- **For the 3.3V power supply & ratiometric output version**, the device provides unidirectional or bidirectional Overcurrent FAULT function. If VOC=0.33V, the device will select the minimum trigger point I_{OCF}(min). If VOC=1.321V, the device will select the maximum trigger point I_{OCF}(max). For all voltages between 0.33V and 1.321V, an Overcurrent FAULT trigger point can be linearly selected between the minimum and maximum levels. When VOC=GND, the device will use the internal default Overcurrent FAULT threshold, I_{OCF}=1.11*IP (A).
- **For the 3.3V power supply & Fixed output version**, the device only provides bidirectional Overcurrent FAULT function. If VOC=0.33V, the device will select the minimum trigger point I_{OCF}(min). If VOC=1.321V, the device will select the maximum trigger point I_{OCF}(max). For all voltages between 0.33 and 1.321V, an Overcurrent FAULT trigger point can be linearly selected between the minimum and maximum levels. When VOC = GND, chip will use the internal default configured Overcurrent FAULT threshold, I_{OC}=1.11*IP (A)

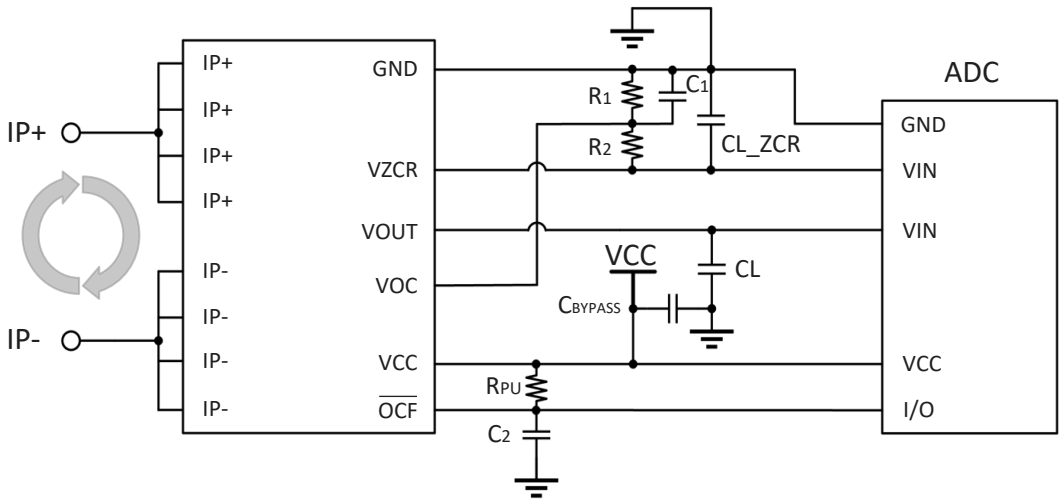

Figure.3 Typical Application Circuit

VOC	IOCF	
VCC=3.3V (V)	XX BR3 XX BF3 (%FS)	XX UR3 (%FS)
<0.1V	111%	55.5%
0.33	50%	25%
0.446	75%	37.5%
0.661	100%	50%
0.826	125%	62.5%
0.991	150%	75%
1.156	175%	87.5%
1.321	200%	100%

VOC	IOCF	
VCC=5V (V)	XX BR5 XX BF5 (%FS)	XX UR5 XX UF5 (%FS)
<0.1V	111%	55.5%
0.5	50%	25%
0.75	75%	37.5%
1	100%	50%
1.25	125%	62.5%
1.5	150%	75%
1.75	175%	87.5%
2	200%	100%

$$IOC=IPR*IOCF \quad VOC=\left(\frac{R1}{R1+R2}\right)*VZCR$$

10 Electrical Magnetic Characteristics

10.1 Absolute Maximum Ratings

Absolute maximum ratings are limited values to be applied individually, and beyond which the serviceability of the circuit may be impaired. Functional operability is not necessarily implied. Exposure to absolute maximum rating conditions for an extended period of time may affect device reliability.

Symbol	Parameters	Min	Max	Units
VCC	Supply Voltage	-	6	V
VRCC	Reverse Battery Voltage	-0.1	-	V
VOUT	Output Voltage	-	VCC+0.5	V
VROUT	Reverse Output Voltage	-0.1	-	V
IOUT(source)	Continuous Output Current	-	40	mA
IOUT(sink)	Continuous Output Current	-	40	mA
TA	Operating Ambient Temperature	-40	150	℃
TS	Storage Temperature	-50	150	℃
TJ	Junction Temperature	-	165	℃

10.2 Isolation and Package Characteristics

Symbol	Parameters	Test Conditions	Value	Units
V_{SURGE}	Dielectric Surge Strength Test Voltage	Tested ±5 pulses at 30 seconds in compliance to IEC 61000-4-5 1.2 / 50 μs (width).	10000	V
I_{SURGE}	Surge Current	Tested ±5 pulses at 30 seconds in compliance to IEC 61000-4-5 8 / 20 μs (width).	13000	A
V_{ISO}	Dielectric Strength Test Voltage	Test method per UL standard 62368-1 (edition 2). $V_{TEST} = V_{ISO}$, t = 60 s (qualification); $V_{TEST} = 1.2 \times V_{ISO}$, t = 1 s (100% production)	4800	Vrms
V_{IOWM}	Maximum Working Isolation Voltage	Maximum working voltage for Basic isolation according to UL62368-1	1550	V_{PK} or V_{DC}
			1097	Vrms
CTI	Comparative Tracking Index	Comparative tracking index according to IEC60112:2009	600	V
D_{CL}	External Clearance	Measured from input terminals to output terminals, shortest distance through air.	8.2	mm
D_{CR}	External Creepage	Measured from input terminals to output terminals, shortest distance path along body.	8.2	mm

10.3 Life Time Characteristics

Symbol	Parameters	Test Condition	Min	Typ	Max	Unit
ESNST_DRIFT	Sensitivity Error Lifetime Drift	TA=-40~150℃	-	±3	-	%
ETOT_DRIFT	Total Output Error Lifetime Drift	TA=-40~150℃	-	±3	-	%

* Based on characterization data obtained during AEC-Q100 stress testing.

10.4 ESD Ratings

Parameters	Reference	Grade
Human-body model (HBM)	AEC-Q100-002	Class IIIA
Charged-device model (CDM)	AEC-Q100-011	Class C3
Latch up	AEC-Q100-004	Class IIA

10.5 Electrical Specifications

At TA =-40~150 ℃, VCC=3.0~5.5V, C_{BYPASS}=0.1uF (unless otherwise specified)

Symbol	Parameters	Test Condition	Min	Typ	Max	Unit
VCC	Supply Voltage	XXBR5, XXBF5	4.5	5	5.5	V
		XXBR3, XXBF3	3.0	3.3	3.6	V
ICC	Supply Current	VCC=5V, TA=25°C	-	15	22	mA
		VCC=3.3V, TA=25°C	-	13	20	mA
RIP	Primary Conductor Resistance	TA=25°C	-	0.75	-	mΩ
BW	Internal Bandwidth	–3 dB; CL=1 nF	-	250	-	kHz
TPO	Power on time	TA=25°C, CL=1nF, IP=IPR(max) applied	-	1.3	-	ms
VUVLOH	Undervoltage Lockout(UVLO) High Voltage	TA = 25°C, VCC rising and device function enabled	-	4	-	V
VUVLOL	Undervoltage Lockout(UVLO) Low Voltage	TA = 25°C, VCC falling and device function disabled	-	3.75	-	V
VUVLOHYS	UVLO Hysteresis	TA = 25°C	-	0.25	-	V
TUVLOD	UVLO Delay Time	TA = 25°C	-	30	-	us
VPORH	Power-On Reset High Voltage	TA = 25°C, VCC rising	-	2.75	-	V
VPORL	Power-On Reset Low Voltage	TA = 25°C, VCC falling	-	2.55	-	V
VPORHYS	Power-On Reset Hysteresis	TA = 25°C	-	0.2	-	V
TR	Rise time	IP=IPR(max), TA=25°C, CL=1nF	-	1.8	-	us
TPD	Propagation Delay	IP = IPR(max), TA=25°C, CL=1nF	-	1.2	-	us
TRES	Response Time Response Time	IP = IPR(max), TA=25°C, CL=1nF	-	2.2	-	us
TRES_OCF	Overcurrent alarm	IP > IOCF(max), C2=1nF TA=25°C, RPU=10kΩ	-	2.7	-	us
VOL	Analog Output Low Saturation Level	RL>=4.7KΩ	-	-	0.3	V
VOH	Analog Output High Saturation Level	RL>=4.7KΩ	VCC-0.3	-	-	V
ROUT	DC Output Resistance	TA=25°C	-	5	-	Ω

* Device may be operated at higher primary current levels, ambient temperatures, and internal leadframe temperatures, provided the Maximum Junction Temperature, is not exceeded.

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Electrical Specifications (*continued*)

At T_A =-40~150 ℃, VCC=3.0~5.5V, C_{BYPASS}=0.1uF (unless otherwise specified)

Symbol	Parameters	Test Condition	Min	Typ	Max	Unit
RL	Output RES Load	Pull-down to GND	4.7	-	-	KΩ
		Pull-up to VCC	4.7	-	-	KΩ
CL	Output CAP Load	OUT to GND	-	0.47	-	nF
ROUT_ZCR	DC VZCR Output Resistance	TA=25°C	-	5	-	Ω
RL_ZCR	VZCR RES Load	Pull-down to GND	4.7	-	-	KΩ
		Pull-up to VCC	4.7	-	-	KΩ
CL_ZCR	VZCR CAP Load	VZCR to GND	-	0.47	-	nF
RPU	Overcurrent FAULT Pull-up RES		4.7	10	-	KΩ
VOCF	Overcurrent FAULT Low Level	RPU=10kΩ, IP>IOCF(max)	-	-	0.3	V
IOCF_HYS	Overcurrent FAULT Hysteresis	VCC=5V	-	15	-	%
		VCC=3.3V	-	15	-	%
IOCF	Overcurrent FAULT Range	Bidirectional	50	-	200	%
		Unidirectional	25	-	100	%
VOC	Overcurrent FAULT Setting Range		0.5	-	2.0	V
EOCF	Overcurrent FAULT Error	TA=25°C	-15	-	15	%
IND	Noise Density	VCC=5V, TA=25°C, CL=1nF	-	323	-	uA/√Hz
		VCC=3.3V, TA=25°C, CL=1nF	-	515	-	uA/√Hz
ELIN	Nonlinearity error	Full Scale	-1.0	0.3	1.0	%
ERAT_SNST[1)]	Ratiometry Sensitivity Error	TA=25°C	-	±1.5	-	%
ERAT_VOQ[1)]	Ratiometry Quiescent Voltage Output Error	TA=25°C	-	±1	-	%
ERAT_VZCR[1)]	Ratiometry Zero Current Reference Voltage Output Error	TA=25°C	-	±1	-	%
PSRR_VOQ[2)]	Power Supply Rejection Ratio VOQ	DC~1kHz, 200mV pk-pk ripple on VCC, IP=0A	-	-40	-	dB
PSRR_VZCR[2)]	Power Supply Rejection Ratio VZCR	DC~1kHz, 200mV pk-pk ripple on VCC, IP=0A	-	-45	-	dB
PSRR_SNST[2)]	Power Supply Rejection Ratio SNST	DC~1kHz, 200mV pk-pk ripple on VCC, IP=IPR(max)	-	-35	-	dB
CMFRR	Common Mode Field Rejection Ratio	Uniform external magnetic field	-	40	-	dB
SNST(match)	Hall Plate Sensitivity Matching	TA=25°C	-	±1	-	%

* Device may be operated at higher primary current levels, ambient temperatures, and internal leadframe temperatures, provided the Maximum Junction Temperature, is not exceeded.

1) ERAT parameter is only applicable to the version with the suffix "xxBRx and xxURx mode"

2) PSRR parameter is only applicable to the version with the suffix "xxBFx and xxUFx mode"

10.6 Accuracy Specifications

MT9522WT-20BR5 T_A =-40~150 ℃, V_{CC}=5V, Ratiometric mode (unless otherwise specified)

Symbol	Parameters	Test Condition	Min	Typ	Max	Unit
IPR	Input Current Range		-20	-	20	A
SNST	Sensitivity	-20A≤IP≤20A	-	100	-	mV/A
VOQ	Zero-Current Output Voltage		-	V_{CC}×0.5	-	V
VZCR	Zero-Current Reference Output Voltage		-	V_{CC}×0.5	-	V
VOE_ZCR	Zero-Current Reference Output Voltage Error	TA=25°C	-10	-	10	mV
		TA=-40°C to 25°C	-20	-	20	mV
		TA=25°C to 150°C	-20	-	20	mV
VOE	Zero-Current Output Error VOQ-VZCR	IP=0 A, TA=25°C	-5	-	5	mV
		IP=0 A, TA=-40°C to 25°C	-20	-	20	mV
		IP=0 A, TA=25°C to 150°C	-20	-	20	mV
ESNST	Sensitivity Error	IP=20A, TA=25°C	-	±1.0	-	%
		IP=20A, TA=-40°C to 25°C	-	±2.5	-	%
		IP=20A, TA=25°C to 150°C	-	±2.0	-	%
ETOT	Total Output Error	IP=20A, TA=25°C	-	±1.5	-	%
		IP=20A, TA = –40°C to 25°C	-	±3.3	-	%
		IP=20A, TA = 25°C to 150°C	-	±2.8	-	%

* Device may be operated at higher primary current levels, ambient temperatures, and internal leadframe temperatures, provided the Maximum Junction Temperature, is not exceeded.

MT9522WT-20BF5 At T_A =-40~150 ℃, V_{CC}=5V, Fixed mode (unless otherwise specified)

Symbol	Parameters	Test Condition	Min	Typ	Max	Unit
IPR	Input Current Range		-20	-	20	A
SNST	Sensitivity	-20A≤IP≤20A	-	100	-	mV/A
VOQ	Zero-Current Output Voltage		-	2.5	-	V
VZCR	Zero-Current Reference Output Voltage		-	2.5	-	V
VOE_ZCR	Zero-Current Reference Output Voltage Error	TA=25°C	-10	-	10	mV
		TA=-40°C to 25°C	-20	-	20	mV
		TA=25°C to 150°C	-20	-	20	mV
VOE	Zero-Current Output Error VOQ-VZCR	IP=0 A, TA=25°C	-5	-	5	mV
		IP=0 A, TA=-40°C to 25°C	-20	-	20	mV
		IP=0 A, TA=25°C to 150°C	-20	-	20	mV
ESNST	Sensitivity Error	IP=20A, TA=25°C	-	±1.0	-	%
		IP=20A, TA=-40°C to 25°C	-	±2.5	-	%
		IP=20A, TA=25°C to 150°C	-	±2.0	-	%
ETOT	Total Output Error	IP=20A, TA=25°C	-	±1.5	-	%
		IP=20A, TA = –40°C to 25°C	-	±3.3	-	%
		IP=20A, TA = 25°C to 150°C	-	±2.8	-	%

* Device may be operated at higher primary current levels, ambient temperatures, and internal leadframe temperatures, provided the Maximum Junction Temperature, is not exceeded.

MT9522WT-30BR5 T_A =-40~150 ℃, V_{CC}=5V, Ratiometric mode (unless otherwise specified)

Symbol	Parameters	Test Condition	Min	Typ	Max	Unit
IPR	Input Current Range		-30	-	30	A
SNST	Sensitivity	-30A≤IP≤30A	-	66.7	-	mV/A
VOQ	Zero-Current Output Voltage		-	V_{CC}×0.5	-	V
VZCR	Zero-Current Reference Output Voltage		-	V_{CC}×0.5	-	V
VOE_ZCR	Zero-Current Reference Output Voltage Error	TA=25°C	-10	-	10	mV
		TA=-40°C to 25°C	-20	-	20	mV
		TA=25°C to 150°C	-20	-	20	mV
VOE	Zero-Current Output Error VOQ-VZCR	IP=0 A, TA=25°C	-5	-	5	mV
		IP=0 A, TA=-40°C to 25°C	-20	-	20	mV
		IP=0 A, TA=25°C to 150°C	-20	-	20	mV
ESNST	Sensitivity Error	IP=30A, TA=25°C	-	±1.0	-	%
		IP=30A, TA=-40°C to 25°C	-	±2.5	-	%
		IP=30A, TA=25°C to 150°C	-	±2.0	-	%
ETOT	Total Output Error	IP=30A, TA=25°C	-	±1.5	-	%
		IP=30A, TA = –40°C to 25°C	-	±3.3	-	%
		IP=30A, TA = 25°C to 150°C	-	±2.8	-	%

* Device may be operated at higher primary current levels, ambient temperatures, and internal leadframe temperatures, provided the Maximum Junction Temperature, is not exceeded.

MT9522WT-30BF5 At T_A =-40~150 ℃, V_{CC}=5V, Fixed mode (unless otherwise specified)

Symbol	Parameters	Test Condition	Min	Typ	Max	Unit
IPR	Input Current Range		-30	-	30	A
SNST	Sensitivity	-30A≤IP≤30A	-	66.7	-	mV/A
VOQ	Zero-Current Output Voltage		-	2.5	-	V
VZCR	Zero-Current Reference Output Voltage		-	2.5	-	V
VOE_ZCR	Zero-Current Reference Output Voltage Error	TA=25°C	-10	-	10	mV
		TA=-40°C to 25°C	-20	-	20	mV
		TA=25°C to 150°C	-20	-	20	mV
VOE	Zero-Current Output Error VOQ-VZCR	IP=0 A, TA=25°C	-5	-	5	mV
		IP=0 A, TA=-40°C to 25°C	-20	-	20	mV
		IP=0 A, TA=25°C to 150°C	-20	-	20	mV
ESNST	Sensitivity Error	IP=30A, TA=25°C	-	±1.0	-	%
		IP=30A, TA=-40°C to 25°C	-	±2.5	-	%
		IP=30A, TA=25°C to 150°C	-	±2.0	-	%
ETOT	Total Output Error	IP=30A, TA=25°C	-	±1.5	-	%
		IP=30A, TA = –40°C to 25°C	-	±3.3	-	%
		IP=30A, TA = 25°C to 150°C	-	±2.8	-	%

* Device may be operated at higher primary current levels, ambient temperatures, and internal leadframe temperatures, provided the Maximum Junction Temperature, is not exceeded.

MT9522WT-40BR5 T_A =-40~150 ℃, V_{CC}=5V, Ratiometric mode (unless otherwise specified)

Symbol	Parameters	Test Condition	Min	Typ	Max	Unit
IPR	Input Current Range		-40	-	40	A
SNST	Sensitivity	-40A≤IP≤40A	-	50	-	mV/A
VOQ	Zero-Current Output Voltage		-	V_{CC}×0.5	-	V
VZCR	Zero-Current Reference Output Voltage		-	V_{CC}×0.5	-	V
VOE_ZCR	Zero-Current Reference Output Voltage Error	TA=25°C	-10	-	10	mV
		TA=-40°C to 25°C	-20	-	20	mV
		TA=25°C to 150°C	-20	-	20	mV
VOE	Zero-Current Output Error VOQ-VZCR	IP=0 A, TA=25°C	-5	-	5	mV
		IP=0 A, TA=-40°C to 25°C	-20	-	20	mV
		IP=0 A, TA=25°C to 150°C	-15	-	15	mV
ESNST	Sensitivity Error	IP=40A, TA=25°C	-	±1.0	-	%
		IP=40A, TA=-40°C to 25°C	-	±2.5	-	%
		IP=40A, TA=25°C to 150°C	-	±2.2	-	%
ETOT	Total Output Error	IP=40A, TA=25°C	-	±1.5	-	%
		IP=40A, TA = –40°C to 25°C	-	±3.3	-	%
		IP=40A, TA = 25°C to 150°C	-	±2.8	-	%

* Device may be operated at higher primary current levels, ambient temperatures, and internal leadframe temperatures, provided the Maximum Junction Temperature, is not exceeded.

MT9522WT-40BF5 At T_A =-40~150 ℃, V_{CC}=5V, Fixed mode (unless otherwise specified)

Symbol	Parameters	Test Condition	Min	Typ	Max	Unit
IPR	Input Current Range		-40	-	40	A
SNST	Sensitivity	-40A≤IP≤40A	-	50	-	mV/A
VOQ	Zero-Current Output Voltage		-	2.5	-	V
VZCR	Zero-Current Reference Output Voltage		-	2.5	-	V
VOE_ZCR	Zero-Current Reference Output Voltage Error	TA=25°C	-10	-	10	mV
		TA=-40°C to 25°C	-20	-	20	mV
		TA=25°C to 150°C	-20	-	20	mV
VOE	Zero-Current Output Error VOQ-VZCR	IP=0 A, TA=25°C	-5	-	5	mV
		IP=0 A, TA=-40°C to 25°C	-20	-	20	mV
		IP=0 A, TA=25°C to 150°C	-15	-	15	mV
ESNST	Sensitivity Error	IP=40A, TA=25°C	-	±1.0	-	%
		IP=40A, TA=-40°C to 25°C	-	±2.5	-	%
		IP=40A, TA=25°C to 150°C	-	±2.2	-	%
ETOT	Total Output Error	IP=40A, TA=25°C	-	±1.5	-	%
		IP=40A, TA = –40°C to 25°C	-	±3.3	-	%
		IP=40A, TA = 25°C to 150°C	-	±2.8	-	%

* Device may be operated at higher primary current levels, ambient temperatures, and internal leadframe temperatures, provided the Maximum Junction Temperature, is not exceeded.

MT9522WT-50BR5 T_A =-40~150 ℃, V_{CC}=5V, Ratiometric mode (unless otherwise specified)

Symbol	Parameters	Test Condition	Min	Typ	Max	Unit
IPR	Input Current Range		-50	-	50	A
SNST	Sensitivity	-50A≤IP≤50A	-	40	-	mV/A
VOQ	Zero-Current Output Voltage		-	V_{CC}×0.5	-	V
VZCR	Zero-Current Reference Output Voltage		-	V_{CC}×0.5	-	V
VOE_ZCR	Zero-Current Reference Output Voltage Error	TA=25°C	-10	-	10	mV
		TA=-40°C to 25°C	-20	-	20	mV
		TA=25°C to 150°C	-20	-	20	mV
VOE	Zero-Current Output Error VOQ-VZCR	IP=0 A, TA=25°C	-5	-	5	mV
		IP=0 A, TA=-40°C to 25°C	-20	-	20	mV
		IP=0 A, TA=25°C to 150°C	-15	-	15	mV
ESNST	Sensitivity Error	IP=30A, TA=25°C	-	±1.0	-	%
		IP=30A, TA=-40°C to 25°C	-	±2.5	-	%
		IP=30A, TA=25°C to 150°C	-	±2.2	-	%
ETOT	Total Output Error	IP=30A, TA=25°C	-	±1.5	-	%
		IP=30A, TA = –40°C to 25°C	-	±3.3	-	%
		IP=30A, TA = 25°C to 150°C	-	±2.8	-	%

* Device may be operated at higher primary current levels, ambient temperatures, and internal leadframe temperatures, provided the Maximum Junction Temperature, is not exceeded.

MT9522WT-50BF5 At T_A =-40~150 ℃, V_{CC}=5V, Fixed mode (unless otherwise specified)

Symbol	Parameters	Test Condition	Min	Typ	Max	Unit
IPR	Input Current Range		-50	-	50	A
SNST	Sensitivity	-50A≤IP≤50A	-	40	-	mV/A
VOQ	Zero-Current Output Voltage		-	2.5	-	V
VZCR	Zero-Current Reference Output Voltage		-	2.5	-	V
VOE_ZCR	Zero-Current Reference Output Voltage Error	TA=25°C	-10	-	10	mV
		TA=-40°C to 25°C	-20	-	20	mV
		TA=25°C to 150°C	-20	-	20	mV
VOE	Zero-Current Output Error VOQ-VZCR	IP=0 A, TA=25°C	-5	-	5	mV
		IP=0 A, TA=-40°C to 25°C	-20	-	20	mV
		IP=0 A, TA=25°C to 150°C	-15	-	15	mV
ESNST	Sensitivity Error	IP=30A, TA=25°C	-	±1.0	-	%
		IP=30A, TA=-40°C to 25°C	-	±2.5	-	%
		IP=30A, TA=25°C to 150°C	-	±2.2	-	%
ETOT	Total Output Error	IP=30A, TA=25°C	-	±1.5	-	%
		IP=30A, TA = –40°C to 25°C	-	±3.3	-	%
		IP=30A, TA = 25°C to 150°C	-	±2.8	-	%

* Device may be operated at higher primary current levels, ambient temperatures, and internal leadframe temperatures, provided the Maximum Junction Temperature, is not exceeded.

MT9522WT-65BR5 T_A =-40~150 ℃, V_{CC}=5V, Ratiometric mode (unless otherwise specified)

Symbol	Parameters	Test Condition	Min	Typ	Max	Unit
IPR	Input Current Range		-65	-	65	A
SNST	Sensitivity	-65A≤IP≤65A	-	30.8	-	mV/A
VOQ	Zero-Current Output Voltage		-	V_{CC}×0.5	-	V
VZCR	Zero-Current Reference Output Voltage		-	V_{CC}×0.5	-	V
VOE_ZCR	Zero-Current Reference Output Voltage Error	TA=25°C	-10	-	10	mV
		TA=-40°C to 25°C	-20	-	20	mV
		TA=25°C to 150°C	-20	-	20	mV
VOE	Zero-Current Output Error VOQ-VZCR	IP=0 A, TA=25°C	-5	-	5	mV
		IP=0 A, TA=-40°C to 25°C	-20	-	20	mV
		IP=0 A, TA=25°C to 150°C	-15	-	15	mV
ESNST	Sensitivity Error	IP=32.5A, TA=25°C	-	±1.0	-	%
		IP=32.5A, TA=-40°C to 25°C	-	±2.5	-	%
		IP=32.5A, TA=25°C to 150°C	-	±2.5	-	%
ETOT	Total Output Error	IP=32.5A, TA=25°C	-	±1.5	-	%
		IP=32.5A, TA = –40°C to 25°C	-	±3.3	-	%
		IP=32.5A, TA = 25°C to 150°C	-	±3.1	-	%

* Device may be operated at higher primary current levels, ambient temperatures, and internal leadframe temperatures, provided the Maximum Junction Temperature, is not exceeded.

MT9522WT-65BF5 At T_A =-40~150 ℃, V_{CC}=5V, Fixed mode (unless otherwise specified)

Symbol	Parameters	Test Condition	Min	Typ	Max	Unit
IPR	Input Current Range		-65	-	65	A
SNST	Sensitivity	-65A≤IP≤65A	-	30.8	-	mV/A
VOQ	Zero-Current Output Voltage		-	2.5	-	V
VZCR	Zero-Current Reference Output Voltage		-	2.5	-	V
VOE_ZCR	Zero-Current Reference Output Voltage Error	TA=25°C	-10	-	10	mV
		TA=-40°C to 25°C	-20	-	20	mV
		TA=25°C to 150°C	-20	-	20	mV
VOE	Zero-Current Output Error VOQ-VZCR	IP=0 A, TA=25°C	-5	-	5	mV
		IP=0 A, TA=-40°C to 25°C	-20	-	20	mV
		IP=0 A, TA=25°C to 150°C	-15	-	15	mV
ESNST	Sensitivity Error	IP=32.5A, TA=25°C	-	±1.0	-	%
		IP=32.5A, TA=-40°C to 25°C	-	±2.5	-	%
		IP=32.5A, TA=25°C to 150°C	-	±2.5	-	%
ETOT	Total Output Error	IP=32.5A, TA=25°C	-	±1.5	-	%
		IP=32.5A, TA = –40°C to 25°C	-	±3.3	-	%
		IP=32.5A, TA = 25°C to 150°C	-	±3.1	-	%

* Device may be operated at higher primary current levels, ambient temperatures, and internal leadframe temperatures, provided the Maximum Junction Temperature, is not exceeded.

MT9522WT-80BR5 T_A =-40~150 ℃, V_{CC}=5V, Ratiometric mode (unless otherwise specified)

Symbol	Parameters	Test Condition	Min	Typ	Max	Unit
IPR	Input Current Range		-80	-	80	A
SNST	Sensitivity	-80A≤IP≤80A	-	25	-	mV/A
VOQ	Zero-Current Output Voltage		-	V_{CC}×0.5	-	V
VZCR	Zero-Current Reference Output Voltage		-	V_{CC}×0.5	-	V
VOE_ZCR	Zero-Current Reference Output Voltage Error	TA=25°C	-10	-	10	mV
		TA=-40°C to 25°C	-20	-	20	mV
		TA=25°C to 150°C	-20	-	20	mV
VOE	Zero-Current Output Error VOQ-VZCR	IP=0 A, TA=25°C	-5	-	5	mV
		IP=0 A, TA=-40°C to 25°C	-20	-	20	mV
		IP=0 A, TA=25°C to 150°C	-15	-	15	mV
ESNST	Sensitivity Error	IP=40A, TA=25°C	-	±1.0	-	%
		IP=40A, TA=-40°C to 25°C	-	±2.5	-	%
		IP=40A, TA=25°C to 150°C	-	±2.5	-	%
ETOT	Total Output Error	IP=40A, TA=25°C	-	±1.5	-	%
		IP=40A, TA = –40°C to 25°C	-	±3.3	-	%
		IP=40A, TA = 25°C to 150°C	-	±3.1	-	%

* Device may be operated at higher primary current levels, ambient temperatures, and internal leadframe temperatures, provided the Maximum Junction Temperature, is not exceeded.

MT9522WT-80BF5 At T_A =-40~150 ℃, V_{CC}=5V, Fixed mode (unless otherwise specified)

Symbol	Parameters	Test Condition	Min	Typ	Max	Unit
IPR	Input Current Range		-80	-	80	A
SNST	Sensitivity	-80A≤IP≤80A	-	25	-	mV/A
VOQ	Zero-Current Output Voltage		-	2.5	-	V
VZCR	Zero-Current Reference Output Voltage		-	2.5	-	V
VOE_ZCR	Zero-Current Reference Output Voltage Error	TA=25°C	-10	-	10	mV
		TA=-40°C to 25°C	-20	-	20	mV
		TA=25°C to 150°C	-20	-	20	mV
VOE	Zero-Current Output Error VOQ-VZCR	IP=0 A, TA=25°C	-5	-	5	mV
		IP=0 A, TA=-40°C to 25°C	-20	-	20	mV
		IP=0 A, TA=25°C to 150°C	-15	-	15	mV
ESNST	Sensitivity Error	IP=40A, TA=25°C	-	±1.0	-	%
		IP=40A, TA=-40°C to 25°C	-	±2.5	-	%
		IP=40A, TA=25°C to 150°C	-	±2.5	-	%
ETOT	Total Output Error	IP=40A, TA=25°C	-	±1.5	-	%
		IP=40A, TA = –40°C to 25°C	-	±3.3	-	%
		IP=40A, TA = 25°C to 150°C	-	±3.1	-	%

* Device may be operated at higher primary current levels, ambient temperatures, and internal leadframe temperatures, provided the Maximum Junction Temperature, is not exceeded.

MT9522WT-100BR5 T_A =-40~150 ℃, V_{CC}=5V, Ratiometric mode (unless otherwise specified)

Symbol	Parameters	Test Condition	Min	Typ	Max	Unit
IPR	Input Current Range		-100	-	100	A
SNST	Sensitivity	-100A≤IP≤100A	-	20	-	mV/A
VOQ	Zero-Current Output Voltage		-	V_{CC}×0.5	-	V
VZCR	Zero-Current Reference Output Voltage		-	V_{CC}×0.5	-	V
VOE_ZCR	Zero-Current Reference Output Voltage Error	TA=25°C	-10	-	10	mV
		TA=-40°C to 25°C	-20	-	20	mV
		TA=25°C to 150°C	-20	-	20	mV
VOE	Zero-Current Output Error VOQ-VZCR	IP=0 A, TA=25°C	-5	-	5	mV
		IP=0 A, TA=-40°C to 25°C	-20	-	20	mV
		IP=0 A, TA=25°C to 150°C	-15	-	15	mV
ESNST	Sensitivity Error	IP=40A, TA=25°C	-	±1.0	-	%
		IP=40A, TA=-40°C to 25°C	-	±2.5	-	%
		IP=40A, TA=25°C to 150°C	-	±2.5	-	%
ETOT	Total Output Error	IP=40A, TA=25°C	-	±1.5	-	%
		IP=40A, TA = –40°C to 25°C	-	±3.3	-	%
		IP=40A, TA = 25°C to 150°C	-	±3.1	-	%

* Device may be operated at higher primary current levels, ambient temperatures, and internal leadframe temperatures, provided the Maximum Junction Temperature, is not exceeded.

MT9522WT-100BF5 At T_A =-40~150 ℃, V_{CC}=5V, Fixed mode (unless otherwise specified)

Symbol	Parameters	Test Condition	Min	Typ	Max	Unit
IPR	Input Current Range		-100	-	100	A
SNST	Sensitivity	-100A≤IP≤100A	-	20	-	mV/A
VOQ	Zero-Current Output Voltage		-	2.5	-	V
VZCR	Zero-Current Reference Output Voltage		-	2.5	-	V
VOE_ZCR	Zero-Current Reference Output Voltage Error	TA=25°C	-10	-	10	mV
		TA=-40°C to 25°C	-20	-	20	mV
		TA=25°C to 150°C	-20	-	20	mV
VOE	Zero-Current Output Error VOQ-VZCR	IP=0 A, TA=25°C	-5	-	5	mV
		IP=0 A, TA=-40°C to 25°C	-20	-	20	mV
		IP=0 A, TA=25°C to 150°C	-15	-	15	mV
ESNST	Sensitivity Error	IP=40A, TA=25°C	-	±1.0	-	%
		IP=40A, TA=-40°C to 25°C	-	±2.5	-	%
		IP=40A, TA=25°C to 150°C	-	±2.5	-	%
ETOT	Total Output Error	IP=40A, TA=25°C	-	±1.5	-	%
		IP=40A, TA = –40°C to 25°C	-	±3.3	-	%
		IP=40A, TA = 25°C to 150°C	-	±3.1	-	%

* Device may be operated at higher primary current levels, ambient temperatures, and internal leadframe temperatures, provided the Maximum Junction Temperature, is not exceeded.

MT9522WT-40UR5 T_A =-40~150 ℃, V_{CC}=5V, Ratiometric mode (unless otherwise specified)

Symbol	Parameters	Test Condition	Min	Typ	Max	Unit
IPR	Input Current Range		0	-	40	A
SNST	Sensitivity	0A≤IP≤40A	-	100	-	mV/A
VOQ	Zero-Current Output Voltage		-	V_{CC}×0.1	-	V
VZCR	Zero-Current Reference Output Voltage		-	V_{CC}×0.1	-	V
VOE_ZCR	Zero-Current Reference Output Voltage Error	TA=25°C	-10	-	10	mV
		TA=-40°C to 25°C	-20	-	20	mV
		TA=25°C to 150°C	-20	-	20	mV
VOE	Zero-Current Output Error VOQ-VZCR	IP=0 A, TA=25°C	-5	-	5	mV
		IP=0 A, TA=-40°C to 25°C	-20	-	20	mV
		IP=0 A, TA=25°C to 150°C	-20	-	20	mV
ESNST	Sensitivity Error	IP=40A, TA=25°C	-	±1.0	-	%
		IP=40A, TA=-40°C to 25°C	-	±2.5	-	%
		IP=40A, TA=25°C to 150°C	-	±2.2	-	%
ETOT	Total Output Error	IP=40A, TA=25°C	-	±1.5	-	%
		IP=40A, TA = –40°C to 25°C	-	±3.3	-	%
		IP=40A, TA = 25°C to 150°C	-	±3.0	-	%

* Device may be operated at higher primary current levels, ambient temperatures, and internal leadframe temperatures, provided the Maximum Junction Temperature, is not exceeded.

MT9522WT-40UF5 At T_A =-40~150 ℃, V_{CC}=5V, Fixed mode (unless otherwise specified)

Symbol	Parameters	Test Condition	Min	Typ	Max	Unit
IPR	Input Current Range		0	-	40	A
SNST	Sensitivity	0A≤IP≤40A	-	100	-	mV/A
VOQ	Zero-Current Output Voltage		-	0.5	-	V
VZCR	Zero-Current Reference Output Voltage		-	0.5	-	V
VOE_ZCR	Zero-Current Reference Output Voltage Error	TA=25°C	-10	-	10	mV
		TA=-40°C to 25°C	-20	-	20	mV
		TA=25°C to 150°C	-20	-	20	mV
VOE	Zero-Current Output Error VOQ-VZCR	IP=0 A, TA=25°C	-5	-	5	mV
		IP=0 A, TA=-40°C to 25°C	-20	-	20	mV
		IP=0 A, TA=25°C to 150°C	-20	-	20	mV
ESNST	Sensitivity Error	IP=40A, TA=25°C	-	±1.0	-	%
		IP=40A, TA=-40°C to 25°C	-	±2.5	-	%
		IP=40A, TA=25°C to 150°C	-	±2.2	-	%
ETOT	Total Output Error	IP=40A, TA=25°C	-	±1.5	-	%
		IP=40A, TA = –40°C to 25°C	-	±3.3	-	%
		IP=40A, TA = 25°C to 150°C	-	±3.0	-	%

* Device may be operated at higher primary current levels, ambient temperatures, and internal leadframe temperatures, provided the Maximum Junction Temperature, is not exceeded.

MT9522WT-50UR5 T_A =-40~150 ℃, V_{CC}=5V, Ratiometric mode (unless otherwise specified)

Symbol	Parameters	Test Condition	Min	Typ	Max	Unit
IPR	Input Current Range		0	-	50	A
SNST	Sensitivity	0A≤IP≤50A	-	80	-	mV/A
VOQ	Zero-Current Output Voltage		-	V_{CC}×0.1	-	V
VZCR	Zero-Current Reference Output Voltage		-	V_{CC}×0.1	-	V
VOE_ZCR	Zero-Current Reference Output Voltage Error	TA=25°C	-10	-	10	mV
		TA=-40°C to 25°C	-20	-	20	mV
		TA=25°C to 150°C	-20	-	20	mV
VOE	Zero-Current Output Error VOQ-VZCR	IP=0 A, TA=25°C	-5	-	5	mV
		IP=0 A, TA=-40°C to 25°C	-20	-	20	mV
		IP=0 A, TA=25°C to 150°C	-20	-	20	mV
ESNST	Sensitivity Error	IP=30A, TA=25°C	-	±1.0	-	%
		IP=30A, TA=-40°C to 25°C	-	±2.5	-	%
		IP=30A, TA=25°C to 150°C	-	±2.2	-	%
ETOT	Total Output Error	IP=30A, TA=25°C	-	±1.5	-	%
		IP=30A, TA = –40°C to 25°C	-	±3.3	-	%
		IP=30A, TA = 25°C to 150°C	-	±3.0	-	%

* Device may be operated at higher primary current levels, ambient temperatures, and internal leadframe temperatures, provided the Maximum Junction Temperature, is not exceeded.

MT9522WT-50UF5 At T_A =-40~150 ℃, V_{CC}=5V, Fixed mode (unless otherwise specified)

Symbol	Parameters	Test Condition	Min	Typ	Max	Unit
IPR	Input Current Range		0	-	50	A
SNST	Sensitivity	0A≤IP≤50A	-	80	-	mV/A
VOQ	Zero-Current Output Voltage		-	0.5	-	V
VZCR	Zero-Current Reference Output Voltage		-	0.5	-	V
VOE_ZCR	Zero-Current Reference Output Voltage Error	TA=25°C	-10	-	10	mV
		TA=-40°C to 25°C	-20	-	20	mV
		TA=25°C to 150°C	-20	-	20	mV
VOE	Zero-Current Output Error VOQ-VZCR	IP=0 A, TA=25°C	-5	-	5	mV
		IP=0 A, TA=-40°C to 25°C	-20	-	20	mV
		IP=0 A, TA=25°C to 150°C	-20	-	20	mV
ESNST	Sensitivity Error	IP=30A, TA=25°C	-	±1.0	-	%
		IP=30A, TA=-40°C to 25°C	-	±2.5	-	%
		IP=30A, TA=25°C to 150°C	-	±2.2	-	%
ETOT	Total Output Error	IP=30A, TA=25°C	-	±1.5	-	%
		IP=30A, TA = –40°C to 25°C	-	±3.3	-	%
		IP=30A, TA = 25°C to 150°C	-	±3.0	-	%

* Device may be operated at higher primary current levels, ambient temperatures, and internal leadframe temperatures, provided the Maximum Junction Temperature, is not exceeded.

MT9522WT-20BR3 T_A =-40~150 ℃, V_{CC}=3.3V, Ratiometric mode (unless otherwise specified)

Symbol	Parameters	Test Condition	Min	Typ	Max	Unit
IPR	Input Current Range		-20	-	20	A
SNST	Sensitivity	-20A≤IP≤20A	-	66	-	mV/A
VOQ	Zero-Current Output Voltage		-	V_{CC}×0.5	-	V
VZCR	Zero-Current Reference Output Voltage		-	V_{CC}×0.5	-	V
VOE_ZCR	Zero-Current Reference Output Voltage Error	TA=25°C	-10	-	10	mV
		TA=-40°C to 25°C	-20	-	20	mV
		TA=25°C to 150°C	-20	-	20	mV
VOE	Zero-Current Output Error VOQ-VZCR	IP=0 A, TA=25°C	-5	-	5	mV
		IP=0 A, TA=-40°C to 25°C	-20	-	20	mV
		IP=0 A, TA=25°C to 150°C	-20	-	20	mV
ESNST	Sensitivity Error	IP=20A, TA=25°C	-	±1.0	-	%
		IP=20A, TA=-40°C to 25°C	-	±2.5	-	%
		IP=20A, TA=25°C to 150°C	-	±2.0	-	%
ETOT	Total Output Error	IP=20A, TA=25°C	-	±1.5	-	%
		IP=20A, TA = –40°C to 25°C	-	±3.3	-	%
		IP=20A, TA = 25°C to 150°C	-	±2.8	-	%

* Device may be operated at higher primary current levels, ambient temperatures, and internal leadframe temperatures, provided the Maximum Junction Temperature, is not exceeded.

MT9522WT-20BF3 At T_A =-40~150 ℃, V_{CC}=3.3V, Fixed mode (unless otherwise specified)

Symbol	Parameters	Test Condition	Min	Typ	Max	Unit
IPR	Input Current Range		-20	-	20	A
SNST	Sensitivity	-20A≤IP≤20A	-	66	-	mV/A
VOQ	Zero-Current Output Voltage		-	1.65	-	V
VZCR	Zero-Current Reference Output Voltage		-	1.65	-	V
VOE_ZCR	Zero-Current Reference Output Voltage Error	TA=25°C	-10	-	10	mV
		TA=-40°C to 25°C	-20	-	20	mV
		TA=25°C to 150°C	-20	-	20	mV
VOE	Zero-Current Output Error VOQ-VZCR	IP=0 A, TA=25°C	-5	-	5	mV
		IP=0 A, TA=-40°C to 25°C	-20	-	20	mV
		IP=0 A, TA=25°C to 150°C	-20	-	20	mV
ESNST	Sensitivity Error	IP=20A, TA=25°C	-	±1.0	-	%
		IP=20A, TA=-40°C to 25°C	-	±2.5	-	%
		IP=20A, TA=25°C to 150°C	-	±2.0	-	%
ETOT	Total Output Error	IP=20A, TA=25°C	-	±1.5	-	%
		IP=20A, TA = –40°C to 25°C	-	±3.3	-	%
		IP=20A, TA = 25°C to 150°C	-	±2.8	-	%

* Device may be operated at higher primary current levels, ambient temperatures, and internal leadframe temperatures, provided the Maximum Junction Temperature, is not exceeded.

MT9522WT-30BR3 T_A =-40~150 ℃, V_{CC}=3.3V, Ratiometric mode (unless otherwise specified)

Symbol	Parameters	Test Condition	Min	Typ	Max	Unit
IPR	Input Current Range		-30	-	30	A
SNST	Sensitivity	-30A≤IP≤30A	-	44	-	mV/A
VOQ	Zero-Current Output Voltage		-	V_{CC}×0.5	-	V
VZCR	Zero-Current Reference Output Voltage		-	V_{CC}×0.5	-	V
VOE_ZCR	Zero-Current Reference Output Voltage Error	TA=25°C	-10	-	10	mV
		TA=-40°C to 25°C	-20	-	20	mV
		TA=25°C to 150°C	-20	-	20	mV
VOE	Zero-Current Output Error VOQ-VZCR	IP=0 A, TA=25°C	-5	-	5	mV
		IP=0 A, TA=-40°C to 25°C	-20	-	20	mV
		IP=0 A, TA=25°C to 150°C	-20	-	20	mV
ESNST	Sensitivity Error	IP=30A, TA=25°C	-	±1.0	-	%
		IP=30A, TA=-40°C to 25°C	-	±2.5	-	%
		IP=30A, TA=25°C to 150°C	-	±2.2	-	%
ETOT	Total Output Error	IP=30A, TA=25°C	-	±1.5	-	%
		IP=30A, TA = –40°C to 25°C	-	±3.3	-	%
		IP=30A, TA = 25°C to 150°C	-	±3.0	-	%

* Device may be operated at higher primary current levels, ambient temperatures, and internal leadframe temperatures, provided the Maximum Junction Temperature, is not exceeded.

MT9522WT-30BF3 At T_A =-40~150 ℃, V_{CC}=3.3V, Fixed mode (unless otherwise specified)

Symbol	Parameters	Test Condition	Min	Typ	Max	Unit
IPR	Input Current Range		-30	-	30	A
SNST	Sensitivity	-30A≤IP≤30A	-	44	-	mV/A
VOQ	Zero-Current Output Voltage		-	1.65	-	V
VZCR	Zero-Current Reference Output Voltage		-	1.65	-	V
VOE_ZCR	Zero-Current Reference Output Voltage Error	TA=25°C	-10	-	10	mV
		TA=-40°C to 25°C	-20	-	20	mV
		TA=25°C to 150°C	-20	-	20	mV
VOE	Zero-Current Output Error VOQ-VZCR	IP=0 A, TA=25°C	-5	-	5	mV
		IP=0 A, TA=-40°C to 25°C	-20	-	20	mV
		IP=0 A, TA=25°C to 150°C	-20	-	20	mV
ESNST	Sensitivity Error	IP=30A, TA=25°C	-	±1.0	-	%
		IP=30A, TA=-40°C to 25°C	-	±2.5	-	%
		IP=30A, TA=25°C to 150°C	-	±2.2	-	%
ETOT	Total Output Error	IP=30A, TA=25°C	-	±1.5	-	%
		IP=30A, TA = –40°C to 25°C	-	±3.3	-	%
		IP=30A, TA = 25°C to 150°C	-	±3.0	-	%

* Device may be operated at higher primary current levels, ambient temperatures, and internal leadframe temperatures, provided the Maximum Junction Temperature, is not exceeded.

MT9522WT-40BR3 T_A =-40~150 ℃, V_{CC}=3.3V, Ratiometric mode (unless otherwise specified)

Symbol	Parameters	Test Condition	Min	Typ	Max	Unit
IPR	Input Current Range		-40	-	40	A
SNST	Sensitivity	-40A≤IP≤40A	-	33	-	mV/A
VOQ	Zero-Current Output Voltage		-	V_{CC}×0.5	-	V
VZCR	Zero-Current Reference Output Voltage		-	V_{CC}×0.5	-	V
VOE_ZCR	Zero-Current Reference Output Voltage Error	TA=25°C	-10	-	10	mV
		TA=-40°C to 25°C	-20	-	20	mV
		TA=25°C to 150°C	-20	-	20	mV
VOE	Zero-Current Output Error VOQ-VZCR	IP=0 A, TA=25°C	-5	-	5	mV
		IP=0 A, TA=-40°C to 25°C	-20	-	20	mV
		IP=0 A, TA=25°C to 150°C	-15	-	15	mV
ESNST	Sensitivity Error	IP=40A, TA=25°C	-	±1.0	-	%
		IP=40A, TA=-40°C to 25°C	-	±2.5	-	%
		IP=40A, TA=25°C to 150°C	-	±2.2	-	%
ETOT	Total Output Error	IP=40A, TA=25°C	-	±1.5	-	%
		IP=40A, TA = –40°C to 25°C	-	±3.3	-	%
		IP=40A, TA = 25°C to 150°C	-	±2.8	-	%

* Device may be operated at higher primary current levels, ambient temperatures, and internal leadframe temperatures, provided the Maximum Junction Temperature, is not exceeded.

MT9522WT-40BF3 At T_A =-40~150 ℃, V_{CC}=3.3V, Fixed mode (unless otherwise specified)

Symbol	Parameters	Test Condition	Min	Typ	Max	Unit
IPR	Input Current Range		-40	-	40	A
SNST	Sensitivity	-40A≤IP≤40A	-	33	-	mV/A
VOQ	Zero-Current Output Voltage		-	1.65	-	V
VZCR	Zero-Current Reference Output Voltage		-	1.65	-	V
VOE_ZCR	Zero-Current Reference Output Voltage Error	TA=25°C	-10	-	10	mV
		TA=-40°C to 25°C	-20	-	20	mV
		TA=25°C to 150°C	-20	-	20	mV
VOE	Zero-Current Output Error VOQ-VZCR	IP=0 A, TA=25°C	-5	-	5	mV
		IP=0 A, TA=-40°C to 25°C	-20	-	20	mV
		IP=0 A, TA=25°C to 150°C	-15	-	15	mV
ESNST	Sensitivity Error	IP=40A, TA=25°C	-	±1.0	-	%
		IP=40A, TA=-40°C to 25°C	-	±2.5	-	%
		IP=40A, TA=25°C to 150°C	-	±2.2	-	%
ETOT	Total Output Error	IP=40A, TA=25°C	-	±1.5	-	%
		IP=40A, TA = –40°C to 25°C	-	±3.3	-	%
		IP=40A, TA = 25°C to 150°C	-	±2.8	-	%

* Device may be operated at higher primary current levels, ambient temperatures, and internal leadframe temperatures, provided the Maximum Junction Temperature, is not exceeded.

MT9522WT-50BR3 T_A =-40~150 ℃, V_{CC}=3.3V, Ratiometric mode (unless otherwise specified)

Symbol	Parameters	Test Condition	Min	Typ	Max	Unit
IPR	Input Current Range		-50	-	50	A
SNST	Sensitivity	-50A≤IP≤50A	-	26.4	-	mV/A
VOQ	Zero-Current Output Voltage		-	V_{CC}×0.5	-	V
VZCR	Zero-Current Reference Output Voltage		-	V_{CC}×0.5	-	V
VOE_ZCR	Zero-Current Reference Output Voltage Error	TA=25°C	-10	-	10	mV
		TA=-40°C to 25°C	-20	-	20	mV
		TA=25°C to 150°C	-20	-	20	mV
VOE	Zero-Current Output Error VOQ-VZCR	IP=0 A, TA=25°C	-5	-	5	mV
		IP=0 A, TA=-40°C to 25°C	-20	-	20	mV
		IP=0 A, TA=25°C to 150°C	-15	-	15	mV
ESNST	Sensitivity Error	IP=30A, TA=25°C	-	±1.0	-	%
		IP=30A, TA=-40°C to 25°C	-	±2.5	-	%
		IP=30A, TA=25°C to 150°C	-	±2.2	-	%
ETOT	Total Output Error	IP=30A, TA=25°C	-	±1.5	-	%
		IP=30A, TA = –40°C to 25°C	-	±3.3	-	%
		IP=30A, TA = 25°C to 150°C	-	±2.8	-	%

* Device may be operated at higher primary current levels, ambient temperatures, and internal leadframe temperatures, provided the Maximum Junction Temperature, is not exceeded.

MT9522WT-50BF3 At T_A =-40~150 ℃, V_{CC}=3.3V, Fixed mode (unless otherwise specified)

Symbol	Parameters	Test Condition	Min	Typ	Max	Unit
IPR	Input Current Range		-50	-	50	A
SNST	Sensitivity	-50A≤IP≤50A	-	26.4	-	mV/A
VOQ	Zero-Current Output Voltage		-	1.65	-	V
VZCR	Zero-Current Reference Output Voltage		-	1.65	-	V
VOE_ZCR	Zero-Current Reference Output Voltage Error	TA=25°C	-10	-	10	mV
		TA=-40°C to 25°C	-20	-	20	mV
		TA=25°C to 150°C	-20	-	20	mV
VOE	Zero-Current Output Error VOQ-VZCR	IP=0 A, TA=25°C	-5	-	5	mV
		IP=0 A, TA=-40°C to 25°C	-20	-	20	mV
		IP=0 A, TA=25°C to 150°C	-15	-	15	mV
ESNST	Sensitivity Error	IP=30A, TA=25°C	-	±1.0	-	%
		IP=30A, TA=-40°C to 25°C	-	±2.5	-	%
		IP=30A, TA=25°C to 150°C	-	±2.2	-	%
ETOT	Total Output Error	IP=30A, TA=25°C	-	±1.5	-	%
		IP=30A, TA = –40°C to 25°C	-	±3.3	-	%
		IP=30A, TA = 25°C to 150°C	-	±2.8	-	%

* Device may be operated at higher primary current levels, ambient temperatures, and internal leadframe temperatures, provided the Maximum Junction Temperature, is not exceeded.

MT9522WT-65BR3 T_A =-40~150 ℃, V_{CC}=3.3V, Ratiometric mode (unless otherwise specified)

Symbol	Parameters	Test Condition	Min	Typ	Max	Unit
IPR	Input Current Range		-65	-	65	A
SNST	Sensitivity	-65A≤IP≤65A	-	20.3	-	mV/A
VOQ	Zero-Current Output Voltage		-	V_{CC}×0.5	-	V
VZCR	Zero-Current Reference Output Voltage		-	V_{CC}×0.5	-	V
VOE_ZCR	Zero-Current Reference Output Voltage Error	TA=25°C	-10	-	10	mV
		TA=-40°C to 25°C	-20	-	20	mV
		TA=25°C to 150°C	-20	-	20	mV
VOE	Zero-Current Output Error VOQ-VZCR	IP=0 A, TA=25°C	-5	-	5	mV
		IP=0 A, TA=-40°C to 25°C	-20	-	20	mV
		IP=0 A, TA=25°C to 150°C	-15	-	15	mV
ESNST	Sensitivity Error	IP=32.5A, TA=25°C	-	±1.0	-	%
		IP=32.5A, TA=-40°C to 25°C	-	±2.5	-	%
		IP=32.5A, TA=25°C to 150°C	-	±2.5	-	%
ETOT	Total Output Error	IP=32.5A, TA=25°C	-	±1.5	-	%
		IP=32.5A, TA = –40°C to 25°C	-	±3.3	-	%
		IP=32.5A, TA = 25°C to 150°C	-	±3.1	-	%

* Device may be operated at higher primary current levels, ambient temperatures, and internal leadframe temperatures, provided the Maximum Junction Temperature, is not exceeded.

MT9522WT-65BF3 At T_A =-40~150 ℃, V_{CC}=3.3V, Fixed mode (unless otherwise specified)

Symbol	Parameters	Test Condition	Min	Typ	Max	Unit
IPR	Input Current Range		-65	-	65	A
SNST	Sensitivity	-65A≤IP≤65A	-	20.3	-	mV/A
VOQ	Zero-Current Output Voltage		-	1.65	-	V
VZCR	Zero-Current Reference Output Voltage		-	1.65	-	V
VOE_ZCR	Zero-Current Reference Output Voltage Error	TA=25°C	-10	-	10	mV
		TA=-40°C to 25°C	-20	-	20	mV
		TA=25°C to 150°C	-20	-	20	mV
VOE	Zero-Current Output Error VOQ-VZCR	IP=0 A, TA=25°C	-5	-	5	mV
		IP=0 A, TA=-40°C to 25°C	-20	-	20	mV
		IP=0 A, TA=25°C to 150°C	-15	-	15	mV
ESNST	Sensitivity Error	IP=32.5A, TA=25°C	-	±1.0	-	%
		IP=32.5A, TA=-40°C to 25°C	-	±2.5	-	%
		IP=32.5A, TA=25°C to 150°C	-	±2.5	-	%
ETOT	Total Output Error	IP=32.5A, TA=25°C	-	±1.5	-	%
		IP=32.5A, TA = –40°C to 25°C	-	±3.3	-	%
		IP=32.5A, TA = 25°C to 150°C	-	±3.1	-	%

* Device may be operated at higher primary current levels, ambient temperatures, and internal leadframe temperatures, provided the Maximum Junction Temperature, is not exceeded.

MT9522WT-80BR3 T_A =-40~150 ℃, V_{CC}=3.3V, Ratiometric mode (unless otherwise specified)

Symbol	Parameters	Test Condition	Min	Typ	Max	Unit
IPR	Input Current Range		-80	-	80	A
SNST	Sensitivity	-80A≤IP≤80A	-	16.5	-	mV/A
VOQ	Zero-Current Output Voltage		-	V_{CC}×0.5	-	V
VZCR	Zero-Current Reference Output Voltage		-	V_{CC}×0.5	-	V
VOE_ZCR	Zero-Current Reference Output Voltage Error	TA=25°C	-10	-	10	mV
		TA=-40°C to 25°C	-20	-	20	mV
		TA=25°C to 150°C	-20	-	20	mV
VOE	Zero-Current Output Error VOQ-VZCR	IP=0 A, TA=25°C	-5	-	5	mV
		IP=0 A, TA=-40°C to 25°C	-20	-	20	mV
		IP=0 A, TA=25°C to 150°C	-15	-	15	mV
ESNST	Sensitivity Error	IP=40A, TA=25°C	-	±1.0	-	%
		IP=40A, TA=-40°C to 25°C	-	±2.5	-	%
		IP=40A, TA=25°C to 150°C	-	±2.5	-	%
ETOT	Total Output Error	IP=40A, TA=25°C	-	±1.5	-	%
		IP=40A, TA = –40°C to 25°C	-	±3.3	-	%
		IP=40A, TA = 25°C to 150°C	-	±3.1	-	%

* Device may be operated at higher primary current levels, ambient temperatures, and internal leadframe temperatures, provided the Maximum Junction Temperature, is not exceeded.

MT9522WT-80BF3 At T_A =-40~150 ℃, V_{CC}=3.3V, Fixed mode (unless otherwise specified)

Symbol	Parameters	Test Condition	Min	Typ	Max	Unit
IPR	Input Current Range		-80	-	80	A
SNST	Sensitivity	-80A≤IP≤80A	-	16.5	-	mV/A
VOQ	Zero-Current Output Voltage		-	1.65	-	V
VZCR	Zero-Current Reference Output Voltage		-	1.65	-	V
VOE_ZCR	Zero-Current Reference Output Voltage Error	TA=25°C	-10	-	10	mV
		TA=-40°C to 25°C	-20	-	20	mV
		TA=25°C to 150°C	-20	-	20	mV
VOE	Zero-Current Output Error VOQ-VZCR	IP=0 A, TA=25°C	-5	-	5	mV
		IP=0 A, TA=-40°C to 25°C	-20	-	20	mV
		IP=0 A, TA=25°C to 150°C	-15	-	15	mV
ESNST	Sensitivity Error	IP=40A, TA=25°C	-	±1.0	-	%
		IP=40A, TA=-40°C to 25°C	-	±2.5	-	%
		IP=40A, TA=25°C to 150°C	-	±2.5	-	%
ETOT	Total Output Error	IP=40A, TA=25°C	-	±1.5	-	%
		IP=40A, TA = –40°C to 25°C	-	±3.3	-	%
		IP=40A, TA = 25°C to 150°C	-	±3.1	-	%

* Device may be operated at higher primary current levels, ambient temperatures, and internal leadframe temperatures, provided the Maximum Junction Temperature, is not exceeded.

MT9522WT-100BR3 T_A =-40~150 ℃, V_{CC}=3.3V, Ratiometric mode (unless otherwise specified)

Symbol	Parameters	Test Condition	Min	Typ	Max	Unit
IPR	Input Current Range		-100	-	100	A
SNST	Sensitivity	-100A≤IP≤100A	-	13.2	-	mV/A
VOQ	Zero-Current Output Voltage		-	V_{CC}×0.5	-	V
VZCR	Zero-Current Reference Output Voltage		-	V_{CC}×0.5	-	V
VOE_ZCR	Zero-Current Reference Output Voltage Error	TA=25°C	-10	-	10	mV
		TA=-40°C to 25°C	-20	-	20	mV
		TA=25°C to 150°C	-20	-	20	mV
VOE	Zero-Current Output Error VOQ-VZCR	IP=0 A, TA=25°C	-5	-	5	mV
		IP=0 A, TA=-40°C to 25°C	-20	-	20	mV
		IP=0 A, TA=25°C to 150°C	-15	-	15	mV
ESNST	Sensitivity Error	IP=40A, TA=25°C	-	±1.0	-	%
		IP=40A, TA=-40°C to 25°C	-	±2.5	-	%
		IP=40A, TA=25°C to 150°C	-	±2.5	-	%
ETOT	Total Output Error	IP=40A, TA=25°C	-	±1.5	-	%
		IP=40A, TA = –40°C to 25°C	-	±3.3	-	%
		IP=40A, TA = 25°C to 150°C	-	±3.1	-	%

* Device may be operated at higher primary current levels, ambient temperatures, and internal leadframe temperatures, provided the Maximum Junction Temperature, is not exceeded.

MT9522WT-80BF3 At T_A =-40~150 ℃, V_{CC}=3.3V, Fixed mode (unless otherwise specified)

Symbol	Parameters	Test Condition	Min	Typ	Max	Unit
IPR	Input Current Range		-100	-	100	A
SNST	Sensitivity	-100A≤IP≤100A	-	13.2	-	mV/A
VOQ	Zero-Current Output Voltage		-	1.65	-	V
VZCR	Zero-Current Reference Output Voltage		-	1.65	-	V
VOE_ZCR	Zero-Current Reference Output Voltage Error	TA=25°C	-10	-	10	mV
		TA=-40°C to 25°C	-20	-	20	mV
		TA=25°C to 150°C	-20	-	20	mV
VOE	Zero-Current Output Error VOQ-VZCR	IP=0 A, TA=25°C	-5	-	5	mV
		IP=0 A, TA=-40°C to 25°C	-20	-	20	mV
		IP=0 A, TA=25°C to 150°C	-15	-	15	mV
ESNST	Sensitivity Error	IP=40A, TA=25°C	-	±1.0	-	%
		IP=40A, TA=-40°C to 25°C	-	±2.5	-	%
		IP=40A, TA=25°C to 150°C	-	±2.5	-	%
ETOT	Total Output Error	IP=40A, TA=25°C	-	±1.5	-	%
		IP=40A, TA = –40°C to 25°C	-	±3.3	-	%
		IP=40A, TA = 25°C to 150°C	-	±3.1	-	%

* Device may be operated at higher primary current levels, ambient temperatures, and internal leadframe temperatures, provided the Maximum Junction Temperature, is not exceeded.

MT9522WT-40UR3 T_A =-40~150 ℃, V_{CC}=3.3V, Ratiometric mode (unless otherwise specified)

Symbol	Parameters	Test Condition	Min	Typ	Max	Unit
IPR	Input Current Range		0	-	40	A
SNST	Sensitivity	0A≤IP≤40A	-	66	-	mV/A
VOQ	Zero-Current Output Voltage		-	V_{CC}×0.1	-	V
VZCR	Zero-Current Reference Output Voltage		-	V_{CC}×0.1	-	V
VOE_ZCR	Zero-Current Reference Output Voltage Error	TA=25°C	-10	-	10	mV
		TA=-40°C to 25°C	-20	-	20	mV
		TA=25°C to 150°C	-20	-	20	mV
VOE	Zero-Current Output Error VOQ-VZCR	IP=0 A, TA=25°C	-5	-	5	mV
		IP=0 A, TA=-40°C to 25°C	-20	-	20	mV
		IP=0 A, TA=25°C to 150°C	-20	-	20	mV
ESNST	Sensitivity Error	IP=40A, TA=25°C	-	±1.0	-	%
		IP=40A, TA=-40°C to 25°C	-	±2.5	-	%
		IP=40A, TA=25°C to 150°C	-	±2.2	-	%
ETOT	Total Output Error	IP=40A, TA=25°C	-	±1.5	-	%
		IP=40A, TA = –40°C to 25°C	-	±3.3	-	%
		IP=40A, TA = 25°C to 150°C	-	±3.0	-	%

* Device may be operated at higher primary current levels, ambient temperatures, and internal leadframe temperatures, provided the Maximum Junction Temperature, is not exceeded.

MT9522WT-50UR3 At T_A =-40~150 ℃, V_{CC}=3.3V, Fixed mode (unless otherwise specified)

Symbol	Parameters	Test Condition	Min	Typ	Max	Unit
IPR	Input Current Range		0	-	50	A
SNST	Sensitivity	0A≤IP≤50A	-	52.8	-	mV/A
VOQ	Zero-Current Output Voltage		-	V_{CC}×0.1	-	V
VZCR	Zero-Current Reference Output Voltage		-	V_{CC}×0.1	-	V
VOE_ZCR	Zero-Current Reference Output Voltage Error	TA=25°C	-10	-	10	mV
		TA=-40°C to 25°C	-20	-	20	mV
		TA=25°C to 150°C	-20	-	20	mV
VOE	Zero-Current Output Error VOQ-VZCR	IP=0 A, TA=25°C	-5	-	5	mV
		IP=0 A, TA=-40°C to 25°C	-20	-	20	mV
		IP=0 A, TA=25°C to 150°C	-20	-	20	mV
ESNST	Sensitivity Error	IP=30A, TA=25°C	-	±1.0	-	%
		IP=30A, TA=-40°C to 25°C	-	±2.5	-	%
		IP=30A, TA=25°C to 150°C	-	±2.2	-	%
ETOT	Total Output Error	IP=30A, TA=25°C	-	±1.5	-	%
		IP=30A, TA = –40°C to 25°C	-	±3.3	-	%
		IP=30A, TA = 25°C to 150°C	-	±3.0	-	%

* Device may be operated at higher primary current levels, ambient temperatures, and internal leadframe temperatures, provided the Maximum Junction Temperature, is not exceeded.

11 Characteristic Definitions

Power On Time---TPO

When the supply is ramped to its operating voltage, the device requires a finite time to power its internal components before responding to an input magnetic field.

The Power-On Time (TPO) is defined as the time taken between the supply reaching the minimum operating voltage VCCmin (t1), and the output voltage to settling to within ±10% of its steady state value under an applied magnetic field (t2) (See Figure 4).

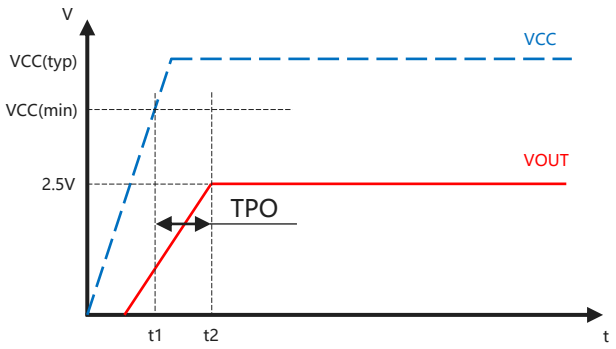


Figure.4 **Power On Time Definition**

Propagation Delay---TPD

The time interval between a) when the primary current signal reaches 20% of its final value, and b) when the output reaches 20% of its final value (see Figure 5).

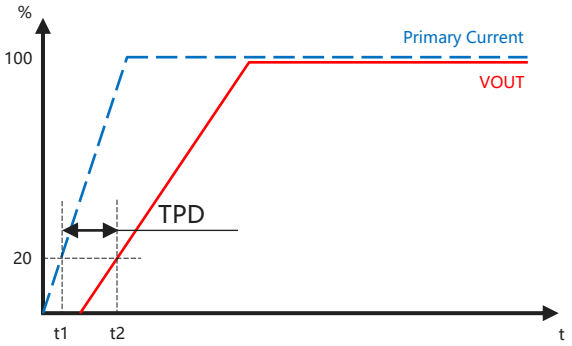


Figure.5 **Propagation Delay Definition**

Rise Time---TR

Rise Time is the time interval between the sensor VOUT reaching 10% of its full scale value (t1), and it reaching 90% of its full scale value (t2). (see Figure 6). Both TR and TRESP can be negatively affected by any eddy current losses created if a conductive ground plane is used.

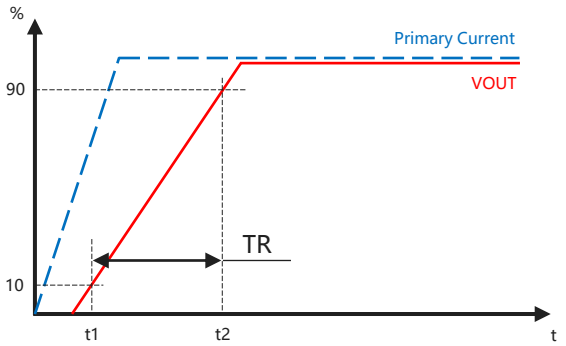


Figure.6 **Rise Time Definition**

Response Time---TRES

The time interval between a) when the primary current signal reaches 80% of its final value, and b) when the sensor reaches 80% of its output corresponding to the applied current. (see Figure 7). Both TR and TRES can be negatively affected by any eddy current losses created if a conductive ground plane is used.

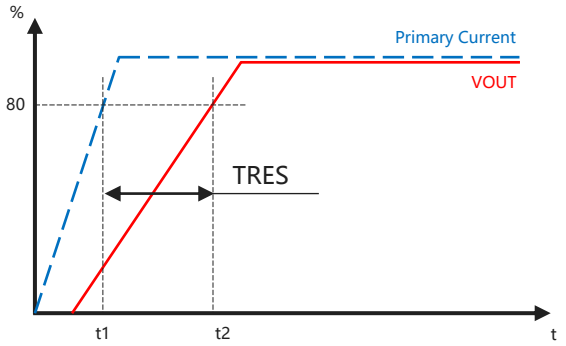


Figure.7 **Response Time Definition**

Zero-Current Output Voltage---VOQ

VOQ is the voltage output when the primary current is zero. For Ratiometric mode , the bidirectional device is 0.5 × VCC and the unidirectional device is 0.1 × VCC when the primary current is zero. For Fixed mode, the bidirectional device is 2.5V or 1.65V and the unidirectional device is 0.5V or 0.33V, when the primary current is zero.

Ratiometric Mode:
When VCC=4.5V, VOQ=1/2*VCC, VOQ=2.25V

Fixed Mode:
When VCC=4.5~5.5V, VOQ=2.5V

Zero-Current Reference Voltage---VZCR

MT9522 provides two different zero current reference voltage output (VZCR), one is the voltage reference output independent of the supply voltage (BF / UF), and the other is the voltage reference output proportional to the supply voltage (BR / UR). Users can know the output voltage corresponding to zero current through VOUT and VZCR. At the same time, it allows users to use either single ended output measurement or differential measurement

Ratiometric Mode:
When VCC=5.5V, VZCR=1/2*VCC, VZCR=2.55V

Fixed Mode:
When VCC=4.5~5.5V, VZCR=2.5V

Sensitivity---SNST

The Sensitivity in mV/A indicates how much the output changes when the primary current changes. It is the product of the magnetic circuit sensitivity (G/A) (1G = 0.1mT) and the linear IC amplifier gain (mV/G). The linear IC amplifier gain is programmed at the factory to optimize the sensitivity (mV/A) for the full-scale current of the device.

$$SNST=\left(\frac{VOUT\_IPOSx-VOUT\_INEGx}{IPOSx-INEGx}\right)$$

where IPOSx and INEGx are two current values with opposite polarities.

Zero-Current Output Error---VOE (VOQ-VZCR)

The deviation of the device output from its ideal quiescent due to nonmagnetic causes. To convert this voltage to amp, divide by the device sensitivity (SNST).

Total Output Error---ETOT

The accuracy represents the maximum deviation of the actual current output from its ideal current value. This is equivalent to the difference between the actual output voltage and the ideal output voltage, divided by the ideal sensitivity, relative to the current flowing through the primary conduction path:

$$ETOT(IP)=\left(\frac{VOUT\_(IP)-VOUT\_ideal(IP)}{SNST\_ideal*IP}\right)*100\%$$

Nonlinearity Sensitivity Error---ELIN

Ideally the primary current vs sensor output function is a straight line. The non-linearity is an indication of the worst deviation from this straight line. The ELIN in % is defined as:

$$ELIN=\left(\frac{SNST\_I1}{SNST\_I2}-1\right)*100\%$$

Where:

$$SNST\_I1=\left(\frac{VOUT\_IPOS1-VOUT\_INEG1}{IPOS1-INEG1}\right)$$

$$SNST\_I2=\left(\frac{VOUT\_IPOS2-VOUT\_INEG2}{IPOS2-INEG2}\right)$$

and IPOSx and INEGx are positive and negative current values, with respect to the quiescent voltage output such that |IPOS2| = |INEG2| = IPRmax, and |IPOS2| = 2 × |IPOS1| and |INEG2| = 2 × |INEG1|.

Power Supply Rejection Ratio VOQ---PSRR_VOQ

It is defined as 20 × log of the ratio of the % change the VOQ over the % change in VCC reported as dB in a specified frequency range.

$$PSRR\_VOQ=20\ lg\left|\frac{\Delta VOQ}{\Delta VCC}\right|$$

For Example:
When VCC changes from 5V to 4.5V (i.e. change -500mv), VOQ changes from 2.5V to 2.505V (i.e. change 5mV), then

$$PSRR\_VZCR=20\ lg\left|\frac{5}{-500}\right|=-40dB$$

Power Supply Rejection Ratio VZCR---PSRR_VZCR

It is defined as 20 × log of the ratio of the % change the VZCR over the % change in VCC reported as dB in a specified frequency range.

$$PSRR\_VOQ=20\ lg\left|\frac{\Delta VZCR}{\Delta VCC}\right|$$

For Example:
When VCC changes from 5V to 5.5V (i.e. change 500mv) and vzcr changes from 2.5V to 2.497V (i.e. change – 3mV), then

$$PSRR\_VZCR=20\ lg\left|\frac{-3}{500}\right|=-44.437dB$$

Power Supply Rejection Ratio SNST---PSRR_SNST

It is defined as 20 × log of the ratio of the % change the SNST over the % change in VCC reported as dB in a specified frequency range.

$$PSRR\_SNST=20\ lg\left|\frac{\Delta SNST\%}{\Delta VCC\%}\right|$$

For Example:
When VCC changes from 5V to 4.5V (i.e. change -10%), the sensitivity changes from 100mV / A to 99.9mv/a (i.e. change -0.1%), then

$$PSRR\_SNST=20\ lg\left|\frac{-0.1\%}{-10\%}\right|=-40dB$$

Ratiometry Error---ERAT

For ratiometric mode, this means that the zero-current voltage output (VOQ) and sensitivity (SNST) are proportional to the supply voltage (Vcc). In other words, when the supply voltage increases or decreases by a certain percentage, each characteristic also increases or decreases by the same percentage. The error is the difference between the measured change of power supply voltage relative to 5V or 3.3V and the measured change of each characteristic

Ratiometry Quiescent Voltage Output Error---ERAT_VOQ

ERAT_VOQ, for a given supply voltage, is defined as:

$$ERAT\_VOQ(5V)=\left(\frac{VOQ(VCC)/VCC)}{VOQ(5V)/5V}-1\right)*100\%$$

$$ERAT\_VOQ(3.3V)=\left(\frac{VOQ(VCC)/VCC)}{VOQ(3.3V)/3.3V}-1\right)*100\%$$

Ratiometry Sensitivity Error---ERAT_SNST

ERAT_SNST, for a given supply voltage, is defined as:

$$ERAT\_SNST(5V)=\left(\frac{SNST\_I1(VCC)/VCC)}{SNST\_I1(5V)/5V}-1\right)*100\%$$

$$ERAT\_SNST(3.3V)=\left(\frac{SNST\_I1(VCC)/VCC)}{SNST\_I1(3.3V)/3.3V}-1\right)*100\%$$

Overcurrent Fault---VOCF

As the output swings because of a sensed current, the Overcurrent Fault pin will trigger with an active low flag if the sensed current exceeds its comparator threshold. The sensing current is compared with the threshold value programmed by the internal factory or through the external VOC voltage. This flag trips symmetrically for the positive and negative OCF operating point.

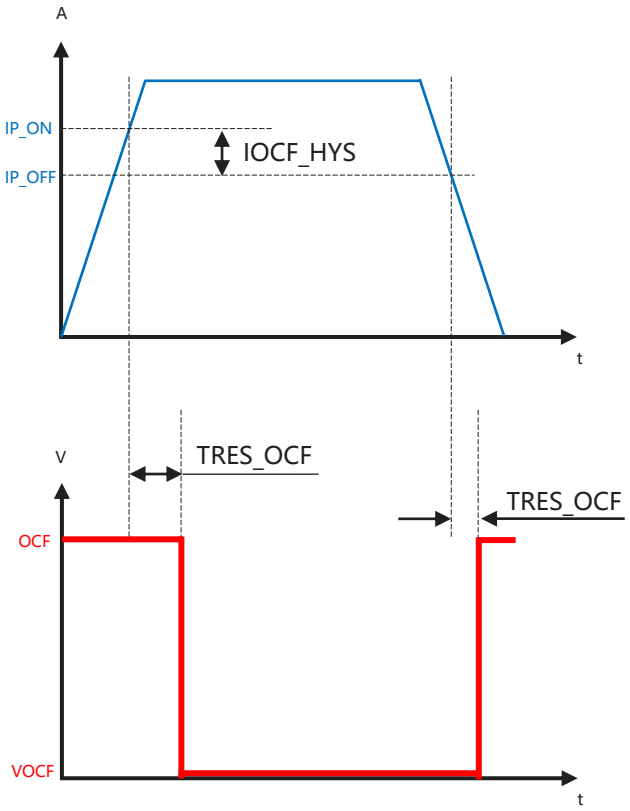


Figure.8 **Overcurrent FAULT Definition**

Overcurrent Fault Error---EOCF

Fault Error or EOCF is the error between the IOCF (actual) and IOCF (ideal).

$$EOCF=\left(\frac{IOC}{IOC(ideal)}-1\right)*100\%$$

Voltage Overcurrent---VOC

The "VOC pin" is used as the analog setting input of "Overcurrent FAULT Output". The voltage of VOC pin can be set by VZCR and divider resistor. When VOC is within the defined area of 0.5 to 2V, the overcurrent FAULT function is effective. For bidirectional products with VCC=5V, setting the VOC pin to 0.5V will select the minimum trigger point IOCF (minimum), and setting the pin to 2V will select the maximum trigger point IOCF (maximum) defined in the performance table. For VCC=5V, a trigger point can be linearly selected between the minimum and maximum levels for all voltages between 0.5 and 2V. When VOC= "ground", the internal EEPROM fault level will be used, IOCF=1.11*IP (A). For VCC = 3.3V, the alarm setting voltage is set in proportion.
The relevant parameters of overcurrent FAULT are defined as follows:

$$VOC=\left(\frac{R1}{R1+R2}\right)*VZCR$$

$$IOC[A]=IOCF*IPR\ [A]$$

VOC	IOCF	
VCC=3.3V (V)	XX BR3 XX BF3 (%FS)	XX UR3 (%FS)
<0.1V	111%	55.5%
0.33	50%	25%
0.661	100%	50%
0.991	150%	75%
1.321	200%	100%

VOC	IOCF	
VCC=5V (V)	XX BR5 XX BF5 (%FS)	XX UR5 XX UF5 (%FS)
<0.1V	111%	55.5%
0.5	50%	25%
1	100%	50%
1.5	150%	75%
2	200%	100%

Power-On Reset---POR, Undervoltage Lockout---UVL

The descriptions in this section assume temperature = 25°C, no output load (RL, CL) , and no significant magnetic field is present.

Power-Up. At power-up, as VCC ramps up, the output is in the following power supply voltage state. When VCC exceeds VPORH, the chip will enters the handshake protocol state. When VCC exceeds VUVLH, the output will go to 1/2*VCC or 2.5V, at this time, the chip is in normal working state.

Power-Down. If VCC drops below VUVLL, the output will be in a high-impedance state. If VCC drops below VPORL, the output is in the following power supply voltage state (See Figure. 9).

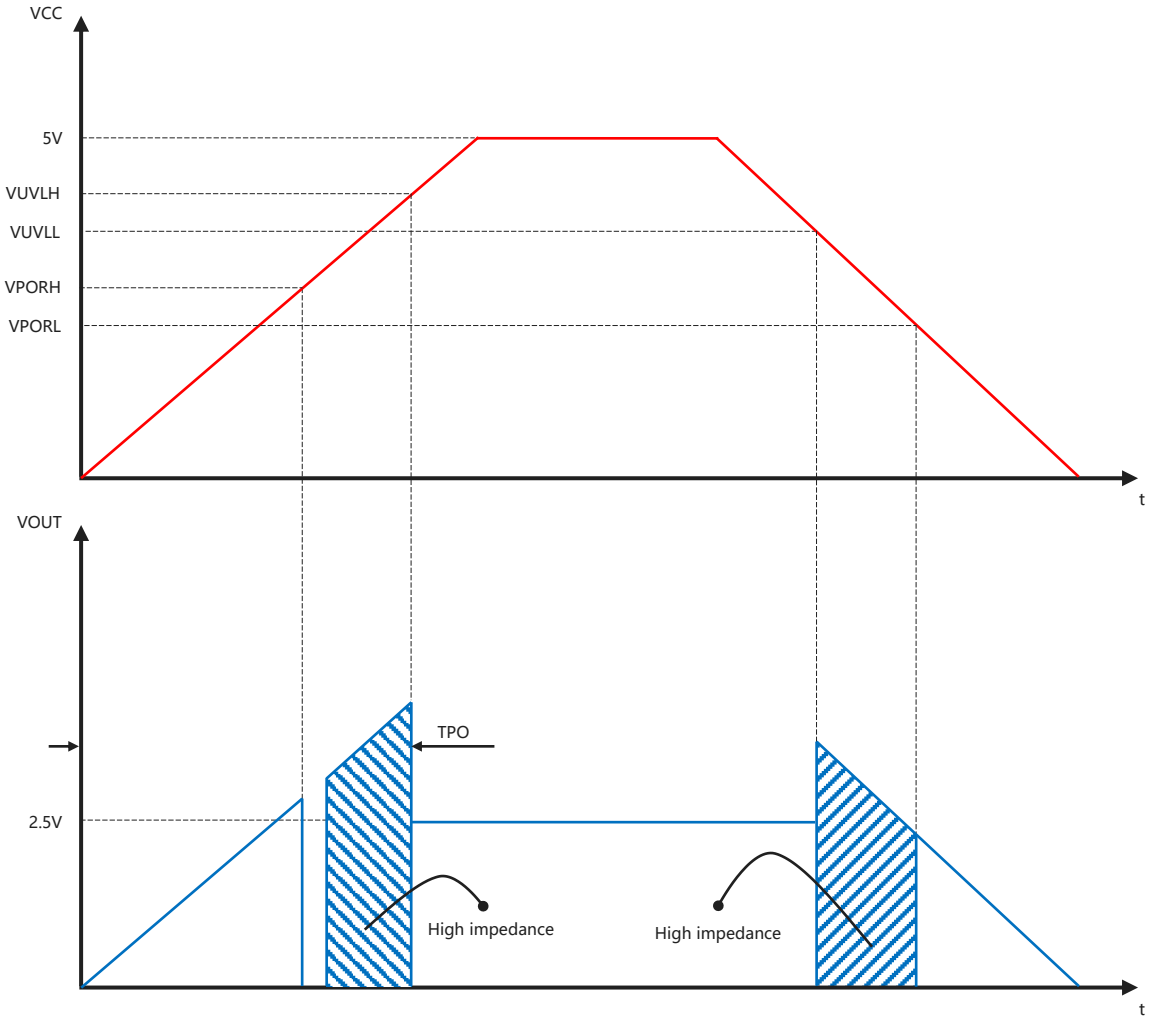
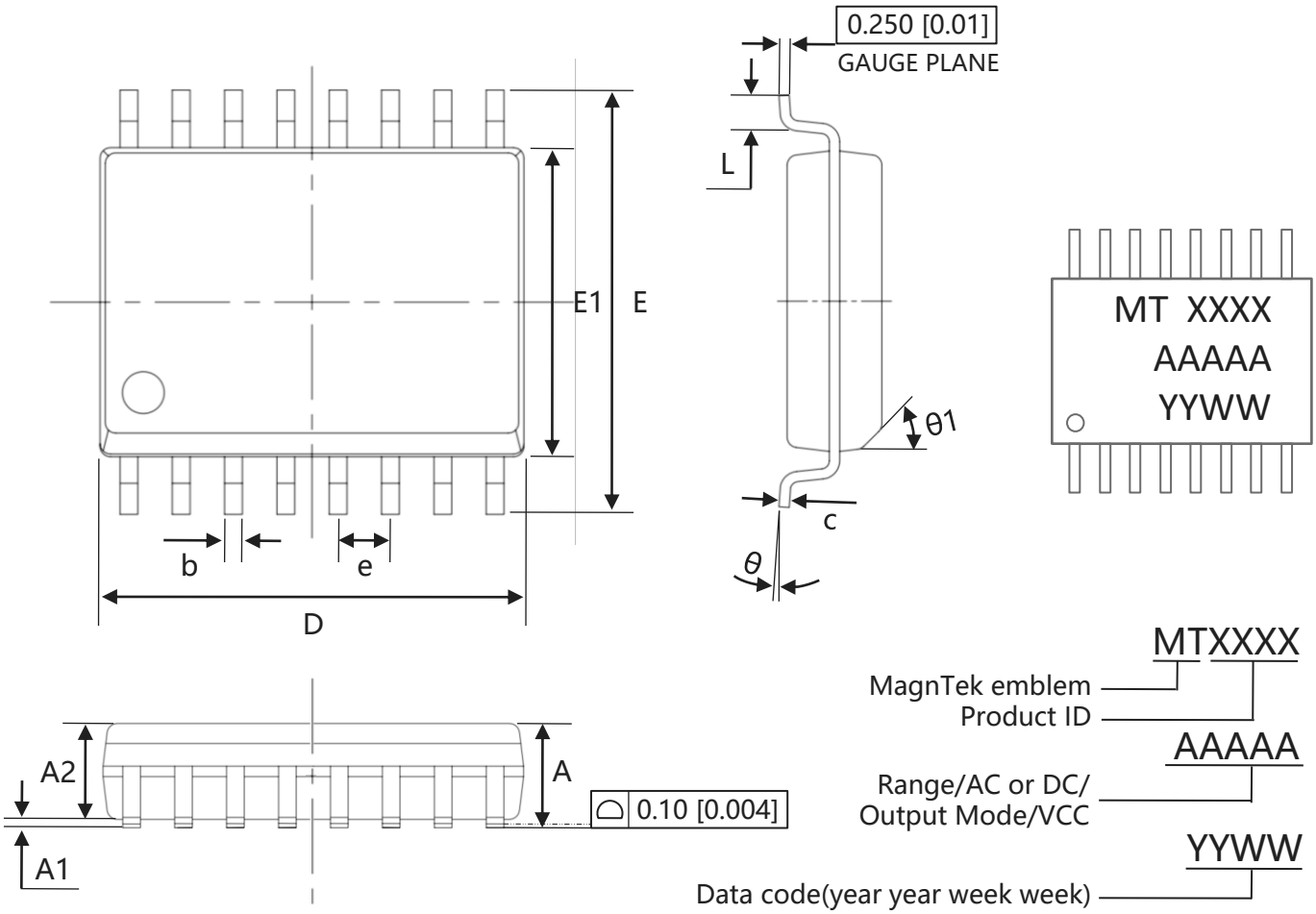


Figure.9 **POR and UVL Definition**

12 Package Material Information (For Reference Only – Not for Tooling Use)

12.1 SOP-16W Package Information



Symbol	Dimensions in Millimeters		Dimensions in Inches	
	Min	Max	Min	Max
A	2.350	2.650	0.093	0.104
A1	0.100	0.300	0.004	0.012
A2	2.050	2.550	0.081	0.100
b	0.330	0.510	0.013	0.020
c	0.230	0.320	0.009	0.013
D	10.10	10.50	0.398	0.413
E	10.00	10.63	0.394	0.419
E1	7.400	7.600	0.291	0.299
e	1.270(BSC)		0.050(BSC)	
L	0.400	1.270	0.016	0.050
θ	0°	8°	0°	8°
θ1	45°		45°	

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