

Description

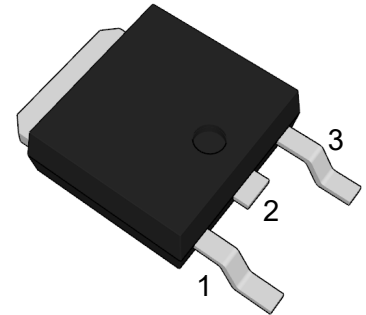
The TN78XXTE series of three-terminal positive regulators are available in TO-252 package. Each type employs internal current limiting, thermal shut-down and safe area protection, making it essentially indestructible. If adequate heat sinking is provided, It can deliver over 1.5A output current, Although designed as fixed voltage regulator, This device can be used with external components to obtain adjustable voltage and currents.

Features

- Input voltage: up to 35V
- Output voltage: 5V,6V,8V,9V,10V,12V,15V
- Output current up to 1.5 A
- Thermal overload protection
- Short circuit current limiting

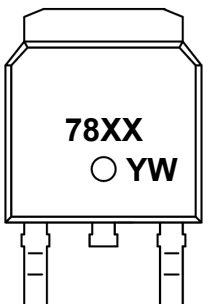
Applications

- DC motor drivers
- Household electric appliances
- Industrial power supplies
- Test and measurement equipment

TO-252


1. VIN 2. GND 3. VOUT

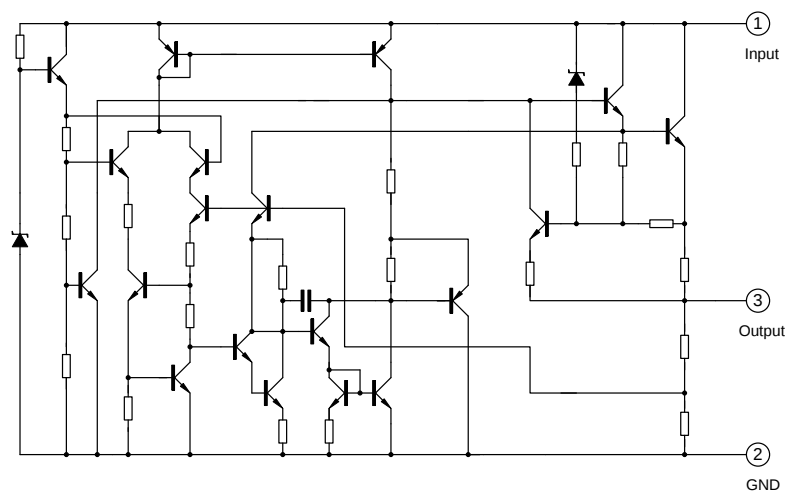
Ordering Information

Orderable Device	Package	Reel (inch)	Package Qty (PCS)	Eco Plan ^{Note}	MSL Level	Marking Code
TN7805TE	TO-252	13	2500	RoHS & Green	MSL3	 78XX: Product code e.g. TN7805TE:7805 YW: Year code and Week code
TN7806TE						
TN7808TE						
TN7809TE						
TN7810TE						
TN7812TE						
TN7815TE						

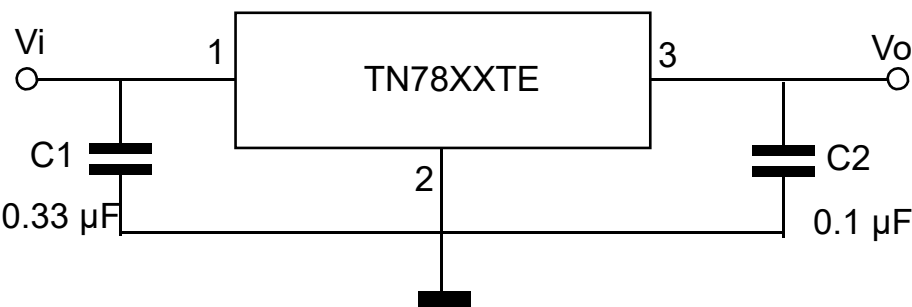
Note:

RoHS: TN defines "RoHS" to mean semiconductor products that are compliant with the current EU RoHS requirements for all 10 RoHS substances, including the requirement that RoHS substance do not exceed 0.1% by weight in homogeneous materials.
Green: TN defines "Green" to mean Halogen-Free and Antimony-Free.

Function Block Diagram



Typical Application Circuit



Absolute Maximum Ratings

Ratings at 25°C ambient temperature unless otherwise specified.

Parameter	Symbol	Value	Unit
Input Voltage	V_I	35	V
Output Current	I_O	1.5	A
Maximum Power Dissipation	P_D	1.9	W
Operating Temperature Range	T_{OPR}	-40 to +125	°C
Storage Temperature Range	T_{STG}	-65 to +150	°C

TN7805TE Electrical Characteristics

$V_I=10V$, $I_O=500mA$, $0<T_J<125^{\circ}C$, $C_I=0.33\mu F$, $C_O=0.1\mu F$, unless otherwise specified.

Parameter	Symbol	Test Conditions	Min.	Typ.	Max.	Unit
Output Voltage	V_O	$T_J=25^{\circ}C$	4.8	5.0	5.2	V
		$I_O=5mA$ to $1A$, $V_I=7.5V$ to $20V$, $P_D<15W$	4.75	5.0	5.25	V
Line Regulation	ΔV_O	$V_I=7.5V$ to $25V$, $T_J=25^{\circ}C$	--	--	100	mV
		$V_I=8V$ to $12V$, $T_J=25^{\circ}C$	--	--	50	mV
Load Regulation	ΔV_O	$I_O=5mA$ to $1.5A$, $T_J=25^{\circ}C$	--	--	100	mV
		$I_O=250mA$ to $750mA$, $T_J=25^{\circ}C$	--	--	50	mV
Ripple Rejection	RR	$V_I=8V$ to $18V$, $f=120Hz$	62	73	--	dB
Dropout Voltage	V_D	$I_O=1A$, $T_J=25^{\circ}C$	--	2	--	V
Quiescent Current	I_Q	$T_J=25^{\circ}C$	--	--	8	mA
Temperature coefficient of V_O	$\Delta V_O/\Delta T$	$I_O=5mA$	--	0.8	--	mV/ $^{\circ}C$
Quiescent Current Change	ΔI_Q	$V_I=8V$ to $25V$	--	--	0.8	mA
		$I_O=5mA$ to $1A$	--	--	0.5	mA
Output Noise Voltage	V_N	$10Hz\leq f\leq 100kHz$, $T_A=25^{\circ}C$	--	42	--	μV

TN7806TE Electrical Characteristics

$V_I=11V$, $I_O=500mA$, $0<T_J<125^{\circ}C$, $C_I=0.33\mu F$, $C_O=0.1\mu F$, unless otherwise specified.

Parameter	Symbol	Test Conditions	Min.	Typ.	Max.	Unit
Output Voltage	V_O	$T_J=25^{\circ}C$	5.75	6.0	6.25	V
		$I_O=5mA$ to $1A$, $V_I=8.5V$ to $21V$, $P_D<15W$	5.7	6.0	6.3	V
Line Regulation	ΔV_O	$V_I=7.5V$ to $25V$, $T_J=25^{\circ}C$	--	--	120	mV
		$V_I=9V$ to $13V$, $T_J=25^{\circ}C$	--	--	60	mV
Load Regulation	ΔV_O	$I_O=5mA$ to $1.5A$, $T_J=25^{\circ}C$	--	--	130	mV
		$I_O=250mA$ to $750mA$, $T_J=25^{\circ}C$	--	--	60	mV
Ripple Rejection	RR	$V_I=9V$ to $19V$, $f=120Hz$	59	70	--	dB
Dropout Voltage	V_D	$I_O=1A$, $T_J=25^{\circ}C$	--	2	--	V
Quiescent Current	I_Q	$T_J=25^{\circ}C$	--	--	8	mA
Temperature coefficient of V_O	$\Delta V_O/\Delta T$	$I_O=5mA$	--	0.9	--	mV/ $^{\circ}C$
Quiescent Current Change	ΔI_Q	$V_I=9V$ to $25V$	--	--	0.8	mA
		$I_O=5mA$ to $1A$	--	--	0.5	mA
Output Noise Voltage	V_N	$10Hz\leq f\leq 100kHz$, $T_A=25^{\circ}C$	--	45	--	μV

TN7808TE Electrical Characteristics

$V_I=14V$, $I_O=500mA$, $0<T_J<125^{\circ}C$, $C_I=0.33\mu F$, $C_O=0.1\mu F$, unless otherwise specified.

Parameter	Symbol	Test Conditions	Min.	Typ.	Max.	Unit
Output Voltage	V_O	$T_J=25^{\circ}C$	7.7	8.0	8.3	V
		$I_O=5mA$ to $1A$, $V_I=11V$ to $23V$, $P_D<15W$	7.6	8.0	8.4	V
Line Regulation	ΔV_O	$V_I=10.5V$ to $25V$, $T_J=25^{\circ}C$	--	--	160	mV
		$V_I=11V$ to $17V$, $T_J=25^{\circ}C$	--	--	80	mV
Load Regulation	ΔV_O	$I_O=5mA$ to $1.5A$, $T_J=25^{\circ}C$	--	--	160	mV
		$I_O=250mA$ to $750mA$, $T_J=25^{\circ}C$	--	--	80	mV
Ripple Rejection	RR	$V_I=11.5V$ to $21.5V$, $f=120Hz$	56	67	--	dB
Dropout Voltage	V_D	$I_O=1A$, $T_J=25^{\circ}C$	--	2	--	V
Quiescent Current	I_Q	$T_J=25^{\circ}C$	--	--	8	mA
Temperature coefficient of V_O	$\Delta V_O/\Delta T$	$I_O=5mA$	--	1.2	--	mV/ $^{\circ}C$
Quiescent Current Change	ΔI_Q	$V_I=11V$ to $25V$	--	--	0.8	mA
		$I_O=5mA$ to $1A$	--	--	0.5	mA
Output Noise Voltage	V_N	$10Hz\leq f\leq 100kHz$, $T_A=25^{\circ}C$	--	52	--	μV

TN7809TE Electrical Characteristics

$V_I=15V$, $I_O=500mA$, $0<T_J<125^{\circ}C$, $C_I=0.33\mu F$, $C_O=0.1\mu F$, unless otherwise specified.

Parameter	Symbol	Test Conditions	Min.	Typ.	Max.	Unit
Output Voltage	V_O	$T_J=25^{\circ}C$	8.65	9.0	9.35	V
		$I_O=5mA$ to $1A$, $V_I=11.5V$ to $24V$, $P_D<15W$	8.6	9.0	9.4	V
Line Regulation	ΔV_O	$V_I=11.5V$ to $25V$, $T_J=25^{\circ}C$	--	--	180	mV
		$V_I=12V$ to $25V$, $T_J=25^{\circ}C$	--	--	90	mV
Load Regulation	ΔV_O	$I_O=5mA$ to $1.5A$, $T_J=25^{\circ}C$	--	--	180	mV
		$I_O=250mA$ to $750mA$, $T_J=25^{\circ}C$	--	--	90	mV
Ripple Rejection	RR	$V_I=13V$ to $23V$, $f=120Hz$	55	66	--	dB
Dropout Voltage	V_D	$I_O=1A$, $T_J=25^{\circ}C$	--	2	--	V
Quiescent Current	I_Q	$T_J=25^{\circ}C$	--	--	8	mA
Temperature coefficient of V_O	$\Delta V_O/\Delta T$	$I_O=5mA$	--	1.3	--	mV/ $^{\circ}C$
Quiescent Current Change	ΔI_Q	$V_I=12V$ to $26V$	--	--	0.8	mA
		$I_O=5mA$ to $1A$	--	--	0.5	mA
Output Noise Voltage	V_N	$10Hz\leq f\leq 100kHz$, $T_A=25^{\circ}C$	--	58	--	μV

TN7810TE Electrical Characteristics

$V_I=16V$, $I_O=500mA$, $0<T_J<125^{\circ}C$, $C_I=0.33\mu F$, $C_O=0.1\mu F$, unless otherwise specified.

Parameter	Symbol	Test Conditions	Min.	Typ.	Max.	Unit
Output Voltage	V_O	$T_J=25^{\circ}C$	9.6	10	10.4	V
		$I_O=5mA$ to 1A, $V_I=12.5V$ to 25V, $P_D<15W$	9.5	10	10.5	V
Line Regulation	ΔV_O	$V_I=12.5V$ to 25V, $T_J=25^{\circ}C$	--	--	200	mV
		$V_I=13V$ to 20V, $T_J=25^{\circ}C$	--	--	100	mV
Load Regulation	ΔV_O	$I_O=5mA$ to 1.5A, $T_J=25^{\circ}C$	--	--	200	mV
		$I_O=250mA$ to 750mA, $T_J=25^{\circ}C$	--	--	100	mV
Ripple Rejection	RR	$V_I=14V$ to 24V, $f=120Hz$	54	65	--	dB
Dropout Voltage	V_D	$I_O=1A$, $T_J=25^{\circ}C$	--	2	--	V
Quiescent Current	I_Q	$T_J=25^{\circ}C$	--	--	8	mA
Temperature coefficient of V_O	$\Delta V_O/\Delta T$	$I_O=5mA$	--	1.4	--	mV/ $^{\circ}C$
Quiescent Current Change	ΔI_Q	$V_I=13V$ to 29V	--	--	0.8	mA
		$I_O=5mA$ to 1A	--	--	0.5	mA
Output Noise Voltage	V_N	$10Hz\leq f\leq 100kHz$, $T_A=25^{\circ}C$	--	58	--	μV

TN7812TE Electrical Characteristics

$V_I=19V$, $I_O=500mA$, $0<T_J<125^{\circ}C$, $C_I=0.33\mu F$, $C_O=0.1\mu F$, unless otherwise specified.

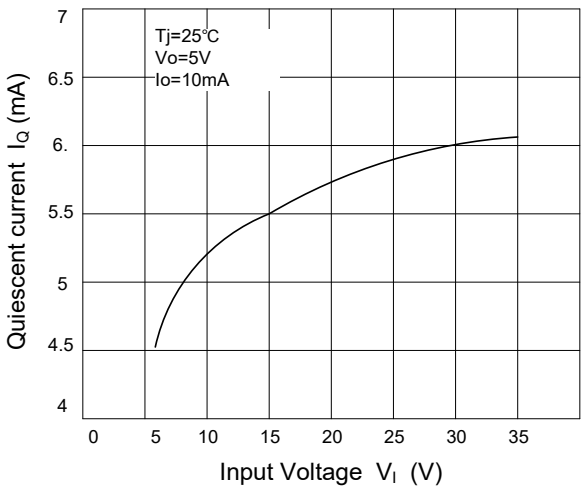
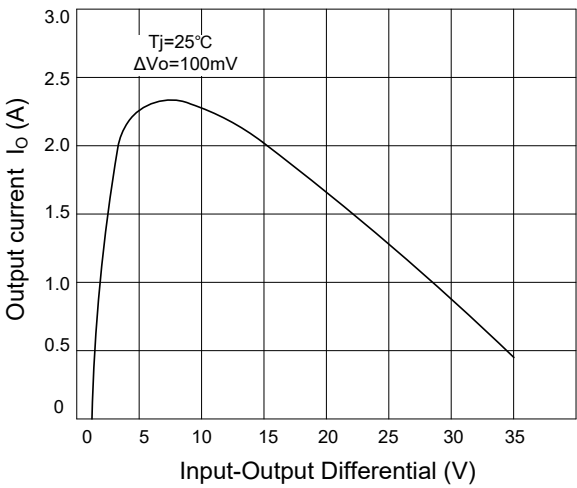
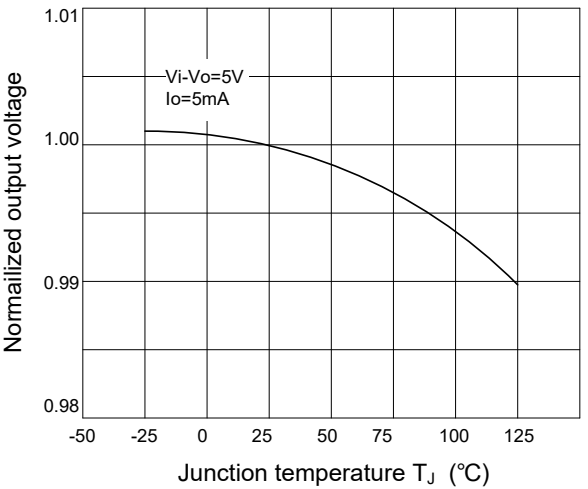
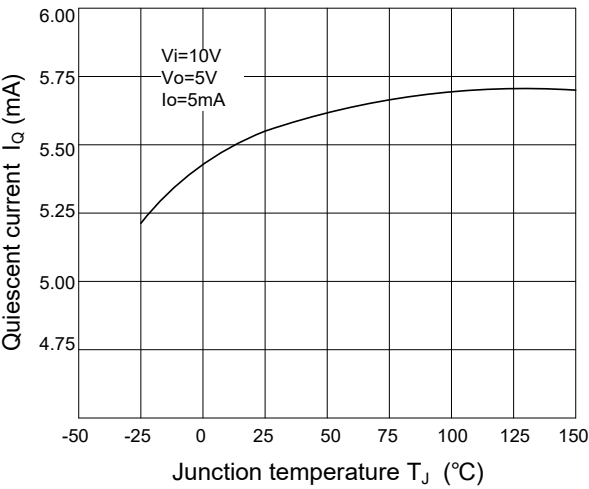
Parameter	Symbol	Test Conditions	Min.	Typ.	Max.	Unit
Output Voltage	V_O	$T_J=25^{\circ}C$	11.5	12	12.5	V
		$I_O=5mA$ to $1A$, $V_I=14.5V$ to $27V$, $P_D<15W$	11.4	12	12.6	V
Line Regulation	ΔV_O	$V_I=14.5V$ to $30V$, $T_J=25^{\circ}C$	--	--	240	mV
		$V_I=16V$ to $22V$, $T_J=25^{\circ}C$	--	--	120	mV
Load Regulation	ΔV_O	$I_O=5mA$ to $1.5A$, $T_J=25^{\circ}C$	--	--	240	mV
		$I_O=250mA$ to $750mA$, $T_J=25^{\circ}C$	--	--	120	mV
Ripple Rejection	RR	$V_I=15V$ to $25V$, $f=120Hz$	53	64	--	dB
Dropout Voltage	V_D	$I_O=1A$, $T_J=25^{\circ}C$	--	2	--	V
Quiescent Current	I_Q	$T_J=25^{\circ}C$	--	--	8	mA
Temperature coefficient of V_O	$\Delta V_O/\Delta T$	$I_O=5mA$	--	1.7	--	mV/ $^{\circ}C$
Quiescent Current Change	ΔI_Q	$V_I=15V$ to $30V$	--	--	0.8	mA
		$I_O=5mA$ to $1A$	--	--	0.5	mA
Output Noise Voltage	V_N	$10Hz\leq f\leq 100kHz$, $T_A=25^{\circ}C$	--	76	--	μV

TN7815TE Electrical Characteristics

$V_I=23V$, $I_O=500mA$, $0<T_J<125^{\circ}C$, $C_I=0.33\mu F$, $C_O=0.1\mu F$, unless otherwise specified.

Parameter	Symbol	Test Conditions	Min.	Typ.	Max.	Unit
Output Voltage	V_O	$T_J=25^{\circ}C$	14.4	15	15.6	V
		$I_O=5mA$ to $1A$, $V_I=17.5V$ to $30V$, $P_D<15W$	14.25	15	15.75	V
Line Regulation	ΔV_O	$V_I=17.5V$ to $30V$, $T_J=25^{\circ}C$	--	--	300	mV
		$V_I=20V$ to $26V$, $T_J=25^{\circ}C$	--	--	150	mV
Load Regulation	ΔV_O	$I_O=5mA$ to $1.5A$, $T_J=25^{\circ}C$	--	--	300	mV
		$I_O=250mA$ to $750mA$, $T_J=25^{\circ}C$	--	--	150	mV
Ripple Rejection	RR	$V_I=18.5V$ to $28.5V$, $f=120Hz$	51	62	--	dB
Dropout Voltage	V_D	$I_O=1A$, $T_J=25^{\circ}C$	--	2	--	V
Quiescent Current	I_Q	$T_J=25^{\circ}C$	--	--	8	mA
Temperature coefficient of V_O	$\Delta V_O/\Delta T$	$I_O=5mA$	--	2	--	mV/ $^{\circ}C$
Quiescent Current Change	ΔI_Q	$V_I=18V$ to $30.5V$	--	--	0.8	mA
		$I_O=5mA$ to $1A$	--	--	0.5	mA
Output Noise Voltage	V_N	$10Hz\leq f\leq 100kHz$, $T_A=25^{\circ}C$	--	90	--	μV

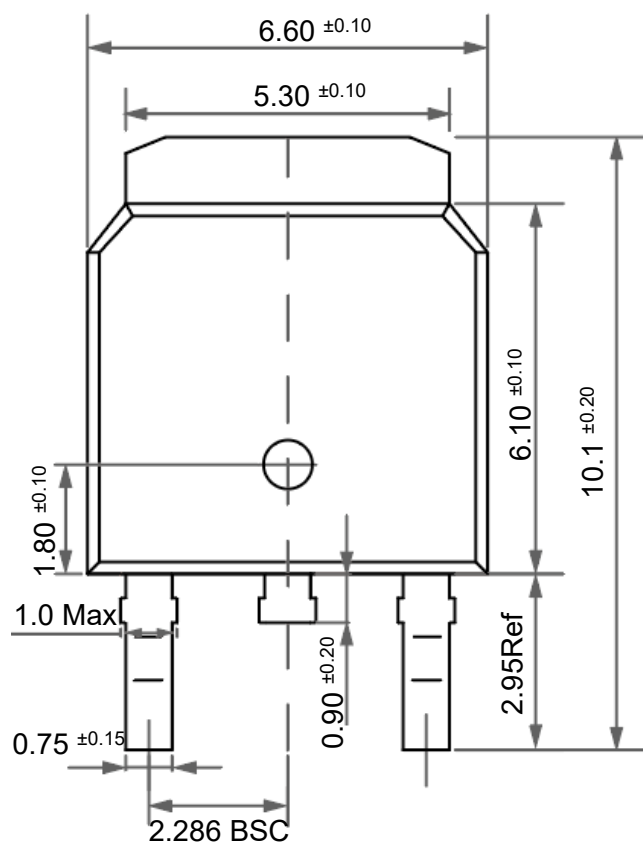
Typical Characteristic Curves



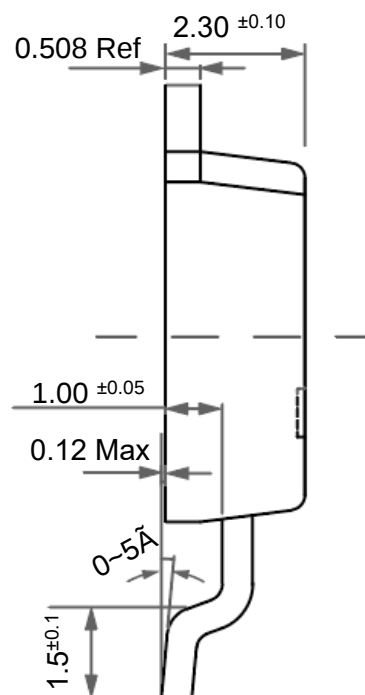
Package Outline

TO-252

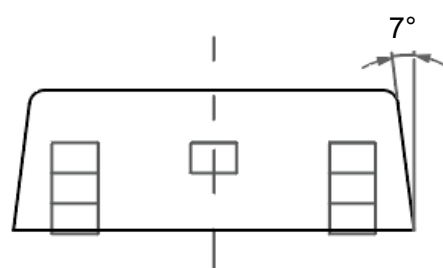
Dimensions in mm



Front View



Side View



Bottom View

Contact Information

TANI website: <http://www.tanisemi.com> Email: tani@tanisemi.com

For additional information, please contact your local Sales Representative.

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Product Specification Statement

The product specification aims to provide users with a reference regarding various product parameters, performance, and usage. It presents certain aspects of the product's performance in graphical form and is intended solely for users to select product and make product comparisons, enabling users to better understand and evaluate the characteristics and advantages of the product. It does not constitute any commitment, warranty, or guarantee.

The product parameters described in the product specification are numerical values, characteristics, and functions obtained through actual testing or theoretical calculations of the product in an independent or ideal state. Due to the complexity of product applications and variations in test conditions and equipment, there may be slight fluctuations in parameter test values. TANI shall not guarantee that the actual performance of the product when installed in the customer's system or equipment will be entirely consistent with the product specification, especially concerning dynamic parameters. It is recommended that users consult with professionals for product selection and system design. Users should also thoroughly validate and assess whether the actual parameters and performance when installed in their respective systems or equipment meet their requirements or expectations. Additionally, users should exercise caution in verifying product compatibility issues, and TANI assumes no responsibility for the application of the product. TANI strives to provide accurate and up -to- date information to the best of our ability. However, due to technical, human, or other reasons, TANI cannot guarantee that the information provided in the product specification is entirely accurate and error-free. TANI shall not be held responsible for any losses or damages resulting from the use or reliance on any information in these product specifications.

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