1. General Description

The WR1117A series of positive adjustable and fixed regulators is designed to provide 1A with high efficiency. All the internal circuitry is designed to operate down to 1.4V input-to-output differential. On-chip trimming adjusts the reference voltage to 2%. The internal current limit circuitry allows the stress on both the regulator and the power source circuitry to be minimized under overload conditions.

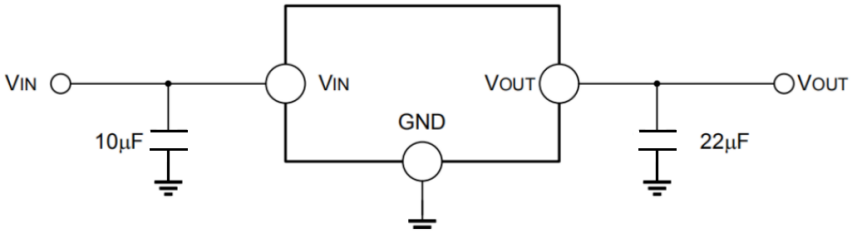
2. Features

- Adjustable or fixed output
- Output current of 1A
- Low dropout 1.3V typ. at 1A output current
- 100% thermal limit burn-in
- Current limit protect
- Fast transient response
- Operating temperature：-40° C ~125° C

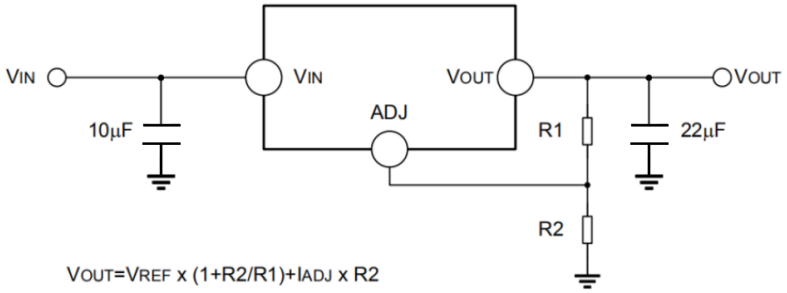
3. Applications

- High efficiency linear regulators
- Post regulators for switching supplies
- Adjustable power supply

4. Typical Application



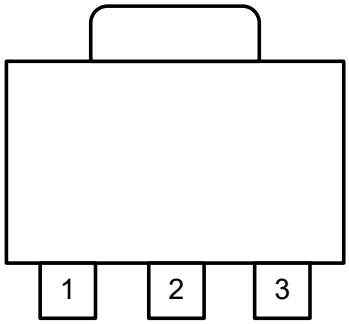
Fixed Voltage Regulator



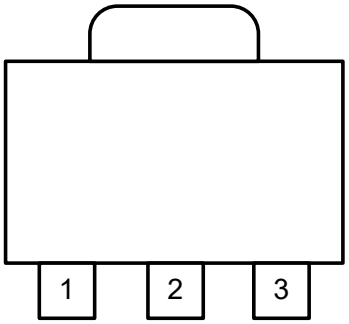
Adjustable Voltage Regulator

5. Pin Configuration

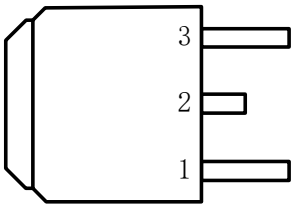
(Top View)



SOT223-3



SOT89-3



TO-252

6. Pin Description

PIN NUMBER	PIN NAME	PIN FUNCTION
1	ADJ/GND	Adjust pin for adjustable output option. Ground pin for fixed output option.
2,TAB	VOUT	Output voltage pin for the regulator.
3	VIN	Input voltage pin for the regulator.

7. Absolute Maximum Ratings

Over operating free-air temperature range (unless otherwise noted)[1]

PARAMETER		RATING	UNIT
Input Voltage		20	V
Operating Junction Temperature		150	℃
Storage Temperature		-65 to 150	℃
Power Dissipation	SOT89-3	0.57	W
	SOT223-3	1.05	
	TO-252	1.25	
Thermal Resistance[2] [4], $R_{\theta JA}$	SOT89-3	175	℃/W
	SOT223-3	95	
	TO-252	80	
Thermal Resistance[2] [3] ,$R_{\theta JB}$	SOT89-3	44	
	SOT223-3	45	
	TO-252	42	
Top Thermal Resistance[2] [3],$R_{\theta JC}$	SOT89-3	55	
	SOT223-3	51	
	TO-252	49	
Bottom Thermal Resistance[2] [3] , $R_{\theta JC}$	SOT89-3	18	
	SOT223-3	21	
	TO-252	17	
Lead Temperature (Soldering, 5 sec)		260	℃
Minimum ESD rating (HBM)		2	kV

NOTE1: Stresses beyond those listed under Absolute Maximum Ratings may cause permanent damage to the device. These are stress ratings only, which do not imply functional operation of the device at these or any other conditions beyond those indicated under Recommended Operating Conditions. Exposure to absolute-maximum-rated conditions for extended periods may affect device reliability.

NOTE2: Measured on 2cm x 2cm 2-layer FR4 PCB board, 2 oz copper, no via holes on GND copper.

NOTE3: Measured according to JEDEC board specification. Detailed description of the board can be found in JESD51−7.

NOTE4: Power dissipation is calculate by $P_{D(MAX)} = (T_J - T_A) / R_{\theta JA}$.

8. Recommended Operating Conditions

PARAMETER	Rating	UNIT
Input Voltage	13	V
Operating Junction Temperature	-40 to 125	℃

9. Electrical Characteristics

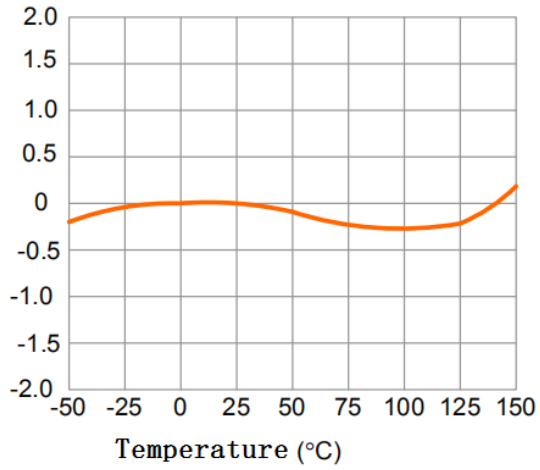
(T_A=25°C, unless otherwise noted)

SYMBOL	PARAMETER	TEST CONDITIONS	MIN	TYP.	MAX	UNIT
V_{REF}	Reference Voltage	WR1117A-ADJ, I_{OUT}=10mA ,V_{IN}-V_{OUT}=2V,T_J = 25℃ 10mA≤I_{OUT}≤1A , 1.4V≤V_{IN}-V_{OUT}≤10V	1.231 1.225	1.250 1.250	1.268 1.275	V
V_{OUT}	Output Voltage	WR1117A-12, I_{OUT}=10mA ,V_{IN} =3.2V,T_J = 25℃ 10mA≤I_{OUT}≤1A , 3.0V≤V_{IN}≤10V	1.176 1.152	1.200 1.200	1.224 1.248	V
		WR1117A-15, I_{OUT}=10mA ,V_{IN} =3.5V,T_J = 25℃ 10mA≤I_{OUT}≤1A , 3.0V≤V_{IN}≤10V	1.477 1.470	1.500 1.500	1.522 1.530	V
		WR1117A-18, I_{OUT}=10mA ,V_{IN} =3.8V,T_J = 25℃ 0≤I_{OUT}≤1A , 3.2V≤V_{IN}≤10V	1.773 1.746	1.800 1.800	1.827 1.854	V
		WR1117A-25, I_{OUT}=10mA ,V_{IN} =4.5V,T_J = 25℃ 0≤I_{OUT}≤1A , 3.9V≤V_{IN}≤10V	2.462 2.450	2.500 2.500	2.538 2.550	V
		WR1117A-33, I_{OUT}=10mA ,V_{IN} =5V,T_J = 25℃ 0≤I_{OUT}≤1A ,4.75V≤V_{IN}≤10V	3.250 3.235	3.300 3.300	3.349 3.365	V
		WR1117A-50, I_{OUT}=10mA ,V_{IN} =7V,T_J = 25℃ 0≤I_{OUT}≤1A ,6.5V≤V_{IN}≤12V	4.925 4.900	5.000 5.000	5.075 5.100	V
TS_{OUT}	Output Voltage Temperature Stability		-	0.3	-	%
LNR	Line Regulation	$V_{IN(MIN)}$≤V_{IN}≤12V, V_{OUT}=Fixed/ADJ, I_{OUT}=10mA	-	9	18	mV
LDR	Load Regulation	10mA≤I_{OUT}≤1A,V_{OUT}=Fixed/ADJ	-	10	18	mV
V_{DO}	Dropout Voltage	I_{OUT}=100mA I_{OUT}=500mA I_{OUT}=800mA I_{OUT}=1A	-	1.00 1.05 1.20 1.30	1.20 1.25 1.30 1.50	V
I_Q	Quiescent Current	4.25V≤V_{IN}≤6.5V	-	5	10	mA

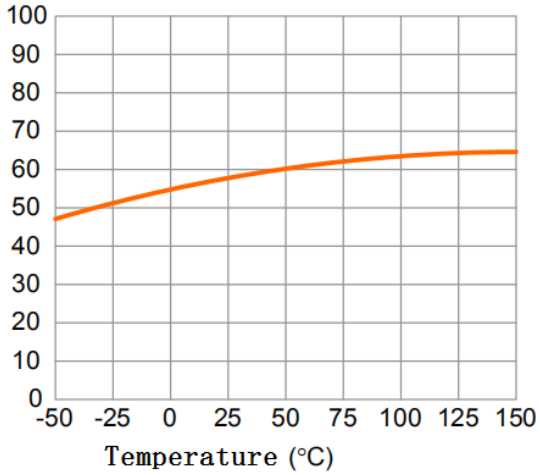
SYMBOL	PARAMETER	TEST CONDITIONS	MIN	TYP.	MAX	UNIT
PSRR	Power Supply Rejection Rate	f_{RIPPLE}=120Hz，V_{IN}-V_{OUT}=3V, V_{RIPPLE}=1V_{PP}	60	75	-	dB
I_{ADJ}	Adjust Pin Current		-	60	120	μA
Δ I_{ADJ}	I_{ADJ} Change	0≤I_{OUT}≤800mA,1.4V≤V_{IN}-V_{OUT}≤10V	-	0.2	5	μA
T_{SD}	Thermal Shutdown Temperature		-	150	-	℃
I_{LIMIT}	Current Limit		-	-	2.5	A
	Temperature Stability		-	0.5	-	%
	Long Term Stability	T_A = 125°C,1000Hrs	-	0.3	-	%
V_{NO}	RMS Output Noise	% of V_{OUT}，10Hz≤f≤10kHz	-	0.003	-	%

10. Typical Performance Characteristics

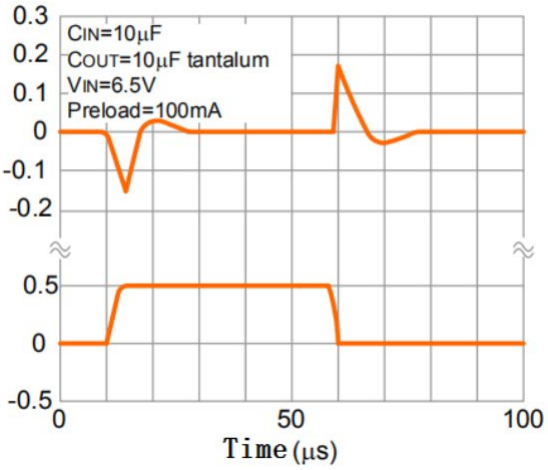
Temperature stability



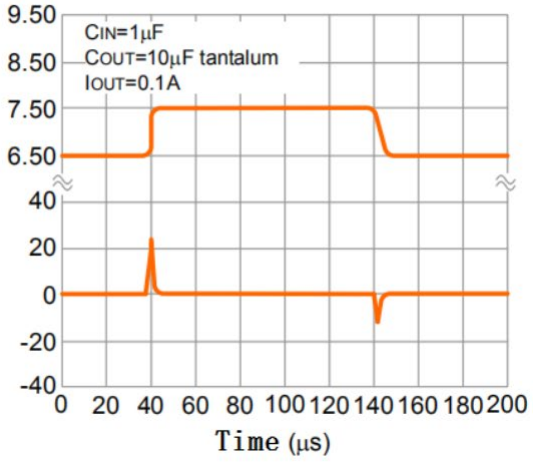
Adjust pin current



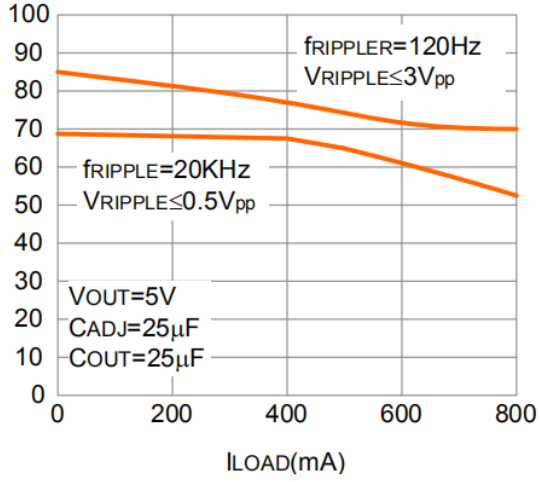
Load transient response (V_{OUT}=5 V)



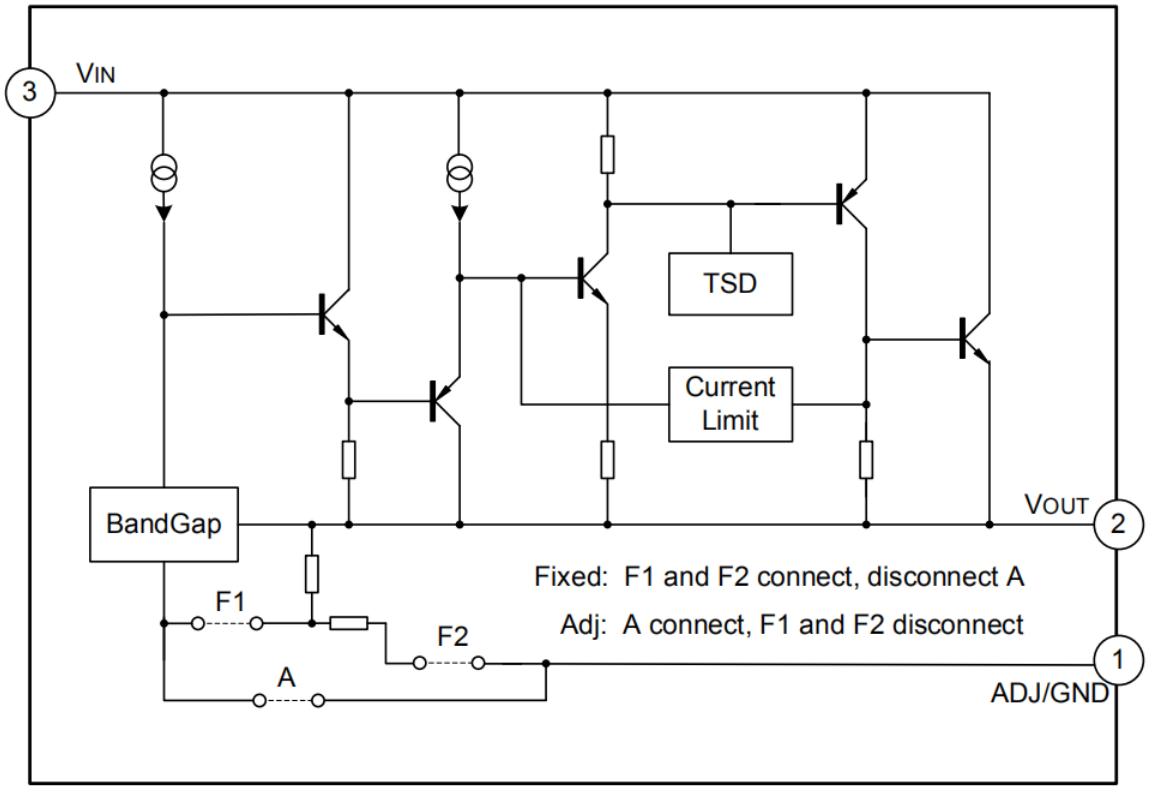
Line transient response (V_{OUT}=5 V)



PSRR(dB) VS Current

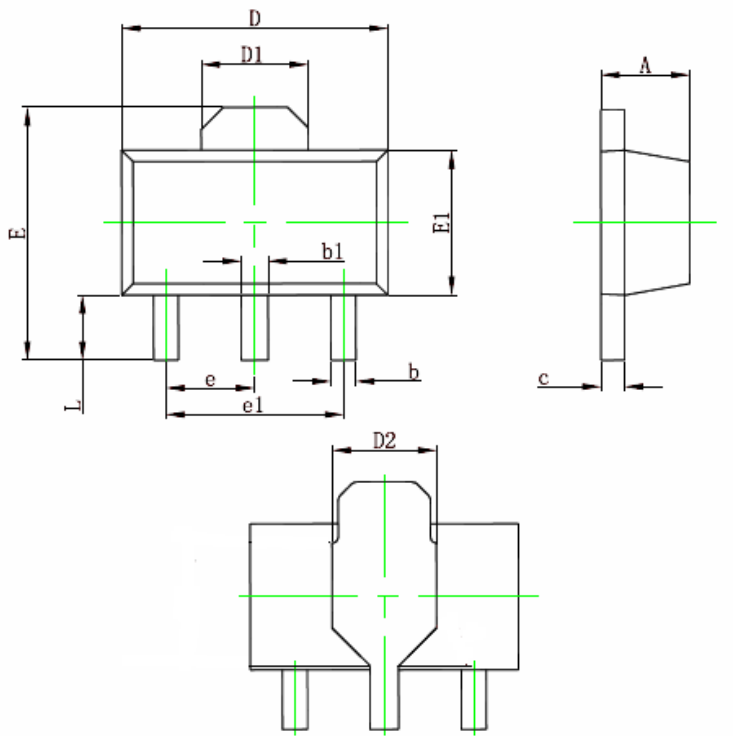


11. Block Diagram



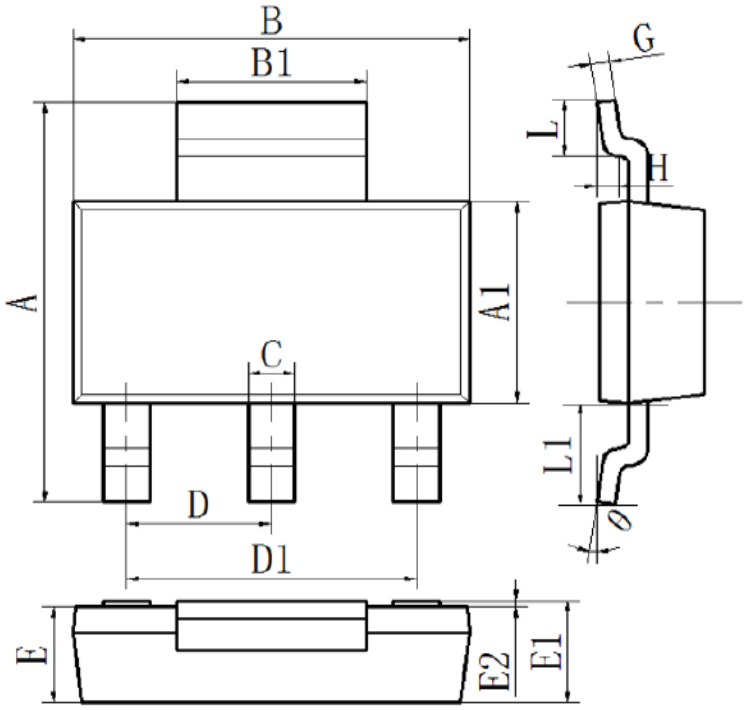
12. Package Information

SOT 89-3



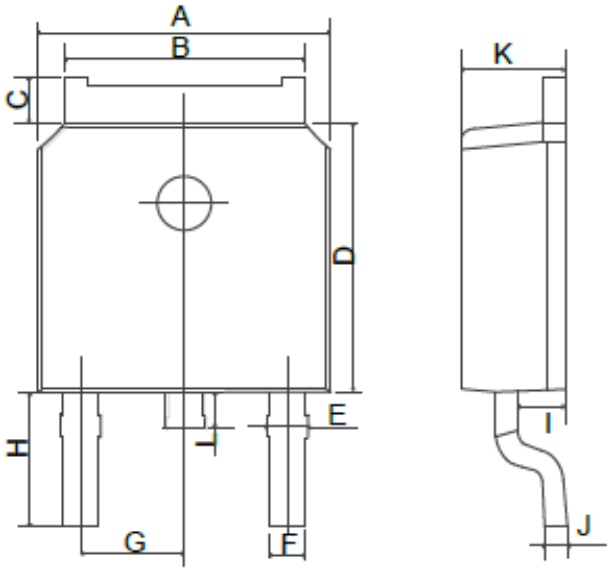
SYMBOL	DIMENSIONS IN MILLIMETERS		
	MIN	NOM	MAX
A	1.400	1.500	1.600
B	0.320	0.420	0.520
b1	0.380	0.480	0.580
c	0.350	0.405	0.460
D	4.400	4.500	4.600
D1	1.65REF		
D2	1.700	1.950	2.200
E	3.940	4.120	4.300
E1	2.300	2.450	2.600
e	1.50BSC		
e1	3.00BSC		
L	0.800	1.000	1.200

SOT223-3



SYMBOL	DIMENSIONS IN MILLIMETERS		
	MIN	NOM	MAX
A	6.7	7.0	7.3
A1	3.3	3.5	3.7
B	6.3	6.5	6.7
B1	2.9	3.0	3.1
C	0.66	0.74	0.82
D	2.25	2.3	2.35
D1	4.5	4.6	4.7
E	1.45	1.6	1.75
E1	1.51	1.66	1.81
E2	0.02	0.08	0.14
G	0.25	0.3	0.35
H	0.20	0.25	0.30
L	0.75	0.95	1.15
L1	1.65	1.75	1.85
θ	0	4	8

TO-252



SYMBOL	DIMENSIONS IN MILLIMETERS		
	MIN	NOM	MAX
A	6.40	6.60	6.80
B	5.13	5.315	5.50
C	0.88	1.08	1.28
D	5.90	6.06	6.22
E	0.68	0.89	1.10
F	0.68	0.795	0.91
G	2.29REF		
H	2.90REF		
I	0.85		1.17
J	0.51REF		
K	2.10	2.30	2.50
L	0.40	0.70	1.00

13. Ordering Information

PART NUMBER	OUTPUT VOLTAGE	PACKAGE	PACKING QUANTITY
WR1117A-ADA70R	ADJ	SOT223-3	2.5k/Reel
WR1117A-12A70R	1.2V	SOT223-3	2.5k/Reel
WR1117A-15A70R	1.5V	SOT223-3	2.5k/Reel
WR1117A-18A70R	1.8V	SOT223-3	2.5k/Reel
WR1117A-25A70R	2.5V	SOT223-3	2.5k/Reel
WR1117A-33A70R	3.3V	SOT223-3	2.5k/Reel
WR1117A-50A70R	5.0V	SOT223-3	2.5k/Reel
WR1117A-ADA20R	ADJ	SOT89-3	1k/Reel
WR1117A-12A20R	1.2V	SOT89-3	1k/Reel
WR1117A-15A20R	1.5V	SOT89-3	1k/Reel
WR1117A-18A20R	1.8V	SOT89-3	1k/Reel
WR1117A-25A20R	2.5V	SOT89-3	1k/Reel
WR1117A-33A20R	3.3V	SOT89-3	1k/Reel
WR1117A-50A20R	5.0V	SOT89-3	1k/Reel
WR1117A-ADT20R	ADJ	TO-252	2.5k/Reel
WR1117A-12T20R	1.2V	TO-252	2.5k/Reel
WR1117A-15T20R	1.5V	TO-252	2.5k/Reel
WR1117A-18T20R	1.8V	TO-252	2.5k/Reel
WR1117A-25T20R	2.5V	TO-252	2.5k/Reel
WR1117A-33T20R	3.3V	TO-252	2.5k/Reel
WR1117A-50T20R	5.0V	TO-252	2.5k/Reel

STATEMENTS

WAY-ON provides data sheets based on the actual performance of the device, and users should verify actual device performance in their specific applications. The device characteristics and parameters in this data sheet can and do vary from application to application, and actual device performance may change over time. This information is intended for developers designing with WAY-ON products. Users are responsible for selecting the appropriate WAY-ON product for their application and for designing and verifying the application to ensure that your application meets the appropriate standards or other requirements, and users are responsible for all consequences. Specifications are subject to change without notice.

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For additional information, please contact your local Sales Representative.

Specifications are subject to change without notice.
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Users should verify actual device performance in their specific applications.