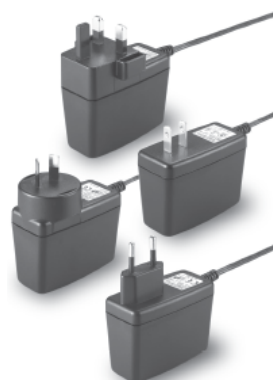




TRG15 SERIES 15 WATT AC-DC I.T.E SWITCHING ADAPTER

Features

- Universal Input Range 90~264Vac
- High Efficiency up to 86%
- Class II
- No Load Power Consumption < 75mW
- Approved IEC/EN/UL 62368-1
- Meets EN55032 Class B and CISPR/FCC Class B
- Operating Altitude 5000m
- Over Voltage Protection
- Continuous Short Circuit Protection
- Meets CoC Tier 2 & DoE Level VI



MODEL NUMBER	OUTPUT VOLTAGE	OUTPUT CURRENT	VOLTAGE ACCURACY NOTE1	RIPPLE & NOISE NOTE2	LINE REGULATION NOTE3	LOAD REGULATION NOTE4	%EFF. (Typ.) NOTE5
TRG1505	5 V	2 A	±2%	50 mV	±1%	±4%	80%
TRG1506	6 V	1.5 A	±2%	60 mV	±1%	±3%	82%
TRG1507	7.5 V	1.6 A	±2%	75 mV	±1%	±3%	83%
TRG1509	9 V	1.4 A	±2%	90 mV	±1%	±2%	84%
TRG1512	12 V	1 A	±2%	100 mV	±1%	±2%	85%
TRG1512-01	13.6 V	1 A	±2%	100 mV	±1%	±2%	85%
TRG1515	15 V	1 A	±2%	100 mV	±1%	±2%	86%
TRG1518	18 V	0.83 A	±2%	100 mV	±1%	±2%	86%
TRG1524	24 V	0.63 A	±2%	100 mV	±1%	±2%	86%

Note:

1. Voltage accuracy is set at 60% full load.
2. Add a 0.1uF ceramic capacitor and a 10uF E.L. capacitor to output for ripple & noise measuring @20MHz BW.
3. Line regulation is measured from 100V_{ac} to 240V_{ac} with 100% full load.
4. Load regulation is measured from 60% to 100% full load and from 60% to 20% full load (60%±40% full load).
5. Typical efficiency at 230 V_{ac} and 75% full load at 25°C.

PART NUMBER

Series	Output Voltage	AC Plug Type	DC Plug Type	Cable Type	Cable Length
TRG15	XX or XX-XX	-X	-XX	X	XX
15W I.T.E Adapter	05 : 5V 06 : 6V 07 : 7.5V 09 : 9V 12 : 12V 12-01 : 13.6V 15 : 15V 18 : 18V 24 : 24V	A: USA 2 Pin E: Europe 2 Pin U: British 3 Pin S: Australia 2 Pin	See Page 7	E : UL1185 with OVP	5V : 1800mm with DC Jack 6V : 1220mm with DC Jack 7.5V : 1800mm with DC Jack 9V : 1800mm with DC Jack 12V : 1800mm with DC Jack 13.6V : 1800mm with DC Jack 15V : 1800mm with DC Jack 18V : 1800mm with DC Jack 24V : 1800mm with DC Jack

Part Number Example:

TRG1512-A-01E03, 12V_{dc} Output, AC Plug Type, DC Jack Type, Cable Length 1800mm



TRG15 Series

TECHNICAL SPECIFICATIONS

(All specifications are typical at nominal input, full load at 25°C unless otherwise noted.)

ABSOLUTE MAXIMUM RATINGS

PARAMETER	NOTES and CONDITIONS	Device	Min.	Typ.	Max.	Units
Input Voltage		All	90		264	V _{ac}
Operating Case Temperature	See Derating Curve	All	-20		60	°C
Storage Temperature		All	-20		85	°C
Operating Altitude		All			5000	m

INPUT CHARACTERISTICS

PARAMETER	NOTES and CONDITIONS	Device	Min.	Typ.	Max.	Units
Operating Voltage Range		All	100		240	V _{ac}
Input Frequency Range		All	47		63	Hz
Maximum Input Current	100% Full load, V _{in} =100V _{ac}	All			0.5	A
Leakage Current		All			250	uA
Inrush Current	V _{in} =240V _{ac} , Cold start at 25°C	All			50	A

OUTPUT CHARACTERISTICS

PARAMETER	NOTES and CONDITIONS	Device	Min.	Typ.	Max.	Units
Output Voltage Set Point	V _{in} =115V _{ac} and 230V _{ac} , I _o =60% Full load T _c =25°C	TRG1505	4.9	5	5.1	V _{dc}
		TRG1506	5.88	6	6.12	
		TRG1507	7.35	7.5	7.65	
		TRG1509	8.82	9	9.18	
		TRG1512	11.76	12	12.24	
		TRG1512-01	13.32	13.6	13.87	
		TRG1515	14.7	15	15.3	
		TRG1518	17.64	18	18.36	
		TRG1524	23.52	24	24.48	
Operating Output Current Range	V _{in} =115V _{ac} and 230V _{ac} , T _c =25°C	TRG1505			2	A
		TRG1506			1.5	
		TRG1507			1.6	
		TRG1509			1.4	
		TRG1512			1	
		TRG1512-01			1	
		TRG1515			1	
		TRG1518			0.83	
		TRG1524			0.63	
Holdup Time	V _{in} =115V _{ac}	All		10		ms
Output Voltage Regulation						
Load Regulation	60%±40% Full load change	TRG1505			±4.0	%
		TRG1506			±3.0	
		TRG1507			±3.0	
		TRG1509			±2.0	
		TRG1512			±2.0	
		TRG1512-01			±2.0	
		TRG1515			±2.0	
		TRG1518			±2.0	
		TRG1524			±2.0	
Line Regulation	V _{in} =100V _{ac} to 240V _{ac}	All			±1.0	%



TRG15 Series

PARAMETER	NOTES and CONDITIONS	Device	Min.	Typ.	Max.	Units
Over Voltage Protection	IC component to clamp (auto recovery)	TRG1505 TRG1506 TRG1507 TRG1509 TRG1512 TRG1512-01 TRG1515 TRG1518 TRG1524			7.14 7.88 10.05 12.1 15.8 16.5 19.5 23.1 28.4	V _{dc}
Over Current Protection	Auto recovery	All	110		160	%
Short Circuit Protection	Auto recovery	All				
Output Ripple and Noise	1. Add a 0.1uF ceramic capacitor and a 10uF aluminum electrolytic capacitor to output 2. Oscilloscope is 20MHz band width 3. Ambient temperature=25°C	TRG1505 TRG1506 TRG1507 TRG1509 TRG1512 TRG1512-01 TRG1515 TRG1518 TRG1524			50 60 75 90 100 100 100 100 100	mV
Load Capacitance	1. V _{in} =115V _{ac} and 230V _{ac} 2. Output is max. load 3. Ambient temperature=25°C	TRG1505 TRG1506 TRG1507 TRG1509 TRG1512 TRG1512-01 TRG1515 TRG1518 TRG1524			2000 1500 1680 1470 1000 1000 1000 830 630	uF
Efficiency	1. V _{in} =230V _{ac} 2. Output is 75% full load 3. Ambient temperature=25°C	TRG1505 TRG1506 TRG1507 TRG1509 TRG1512 TRG1512-01 TRG1515 TRG1518 TRG1524		80% 82% 83% 84% 85% 85% 86% 86% 86%		%

ISOLATION CHARACTERISTICS

PARAMETER	NOTES and CONDITIONS	Device	Min.	Typ.	Max.	Units
Input to Output	1 minute	All			3000	V _{ac}
Isolation Resistance	Input to output	All	100			MΩ

FEATURE CHARACTERISTICS

PARAMETER	NOTES and CONDITIONS	Device	Min.	Typ.	Max.	Units
Switching Frequency	V _{in} =115V _{ac} , I _o =100% V _{in} =230V _{ac} , I _o =100%	All		85 65		kHz



TRG15 Series

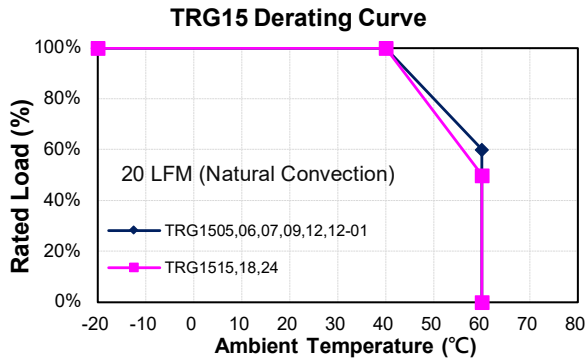
GENERAL SPECIFICATIONS

PARAMETER	NOTES and CONDITIONS	Device	Min.	Typ.	Max.	Units
MTBF	$I_o=100\%$; $T_a=25^{\circ}\text{C}$ per MIL-HDBK-217F	All	200			k hours
Humidity	Non-condensing	All			93	% RH
Shock	Meet MIL-STD-810F Table 516.5, Table 516.5-I 10ms, each axis 3 times($\pm X$ 、 $\pm Y$ 、 $\pm Z$ axis)	All		75		g
Vibration	Meet MIL-STD-810F Table 514.5C-VIII, 15~2000Hz, X、Y、Z axis, 1 hour (each axis),. Total 3 hrs.	All		4		g
Weight		All		140		g
Dimensions		All	2.835x2.047x1.378 inches (72.00x52.00x35.00 mm)			
Safety	Class II, IEC/EN/UL 62368-1					Ed.3.0
EMC Emission	EN 55032:2015/A1:2020, EN 61000-3-2:2019, EN 61000-3-3:2013/A1:2019, FCC CFR Title 47 Part 15 Subpart B: 2007, ICES-003 Issue 4					Class B
Conducted Disturbance	EN 55032:2015/A1:2020, EN 61000-6-3:2021, EN 61204-3:2018					Class B
Radiated Disturbance	EN 55032:2015/A1:2020, EN 61000-6-3:2021, EN 61204-3:2018					Class B
Power Harmonics	EN 61000-3-2:2019					
Voltage Fluctuations	EN 61000-3-3:2013/A1:2019					
EMC Immunity	EN 55035:2017/A11:2020, EN 61204-3:2018, EN 61000-6-1:2019					
Electrostatic Discharge (ESD)	IEC 61000-4-2 Ed. 2.0: 2008, Air Discharge: $\pm 8\text{kV}$, Contact Discharge: $\pm 4\text{kV}$					Criteria A
Radio-Frequency, Continuous Radiated Disturbance	IEC 61000-4-3 Ed. 4.0: 2020					Criteria A
Electrical Fast Transient (EFT)	IEC 61000-4-4 Ed. 3.0: 2012, $\pm 1\text{kV}$					Criteria A
Surge	IEC 61000-4-5 Ed. 3.1: 2017, L-N: $\pm 1\text{kV}$					Criteria A
Conducted disturbances, induced by RF fields	IEC 61000-4-6 Ed. 4.0: 2013					Criteria A
Power frequency magnetic field	IEC 61000-4-8 Ed. 2.0: 2009					Criteria A
Voltage dips	IEC 61000-4-11 Ed. 3.0: 2020, Dips: 30% Reduction, Dips: >95% Reduction					Criteria B
Voltage interruptions	IEC 61000-4-11 Ed. 3.0: 2020, >95% reduction					Criteria B
Application Note Link			TRG15 Series App Notes			

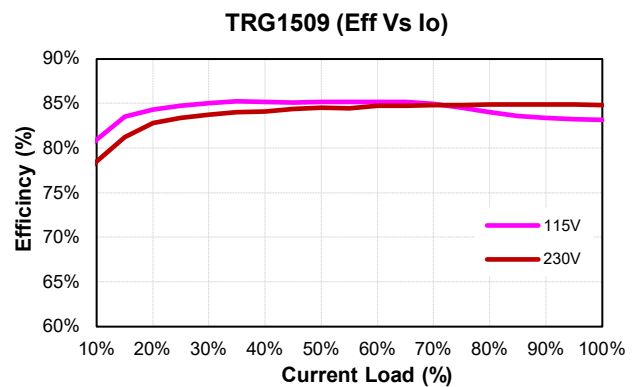
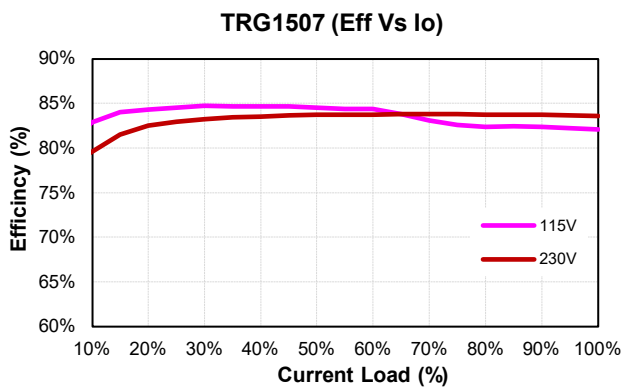
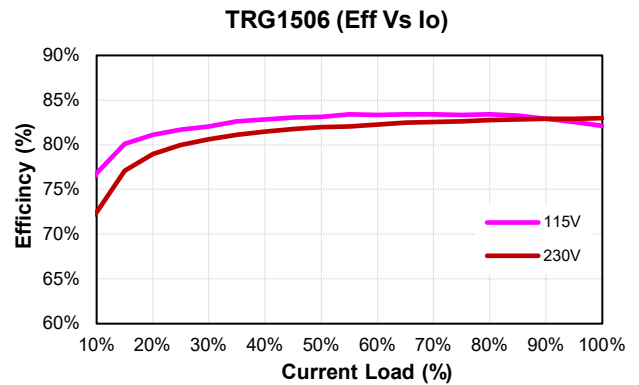
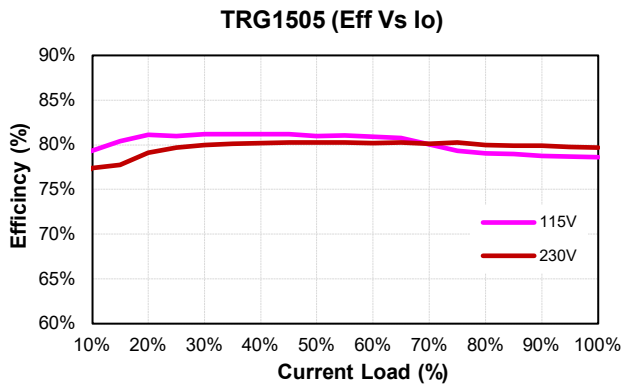


CHARACTERISTIC CURVE

Power Derating Curve



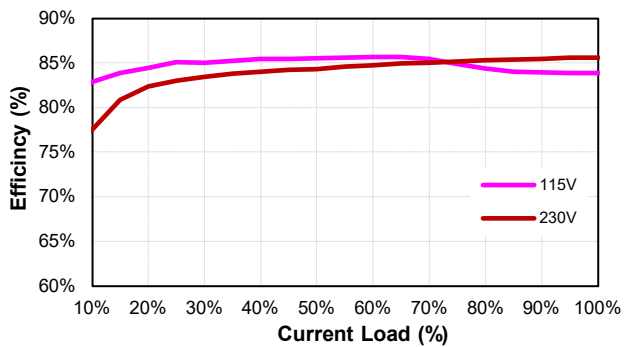
Performance Data



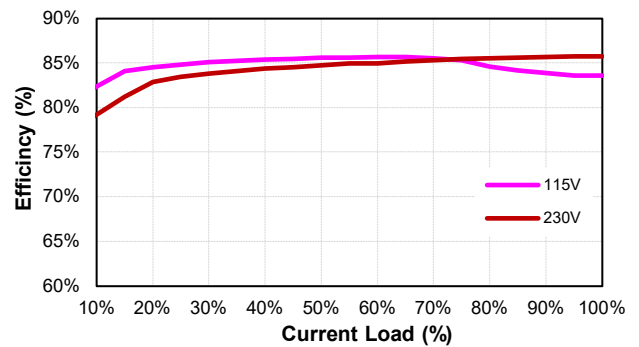


TRG15 Series

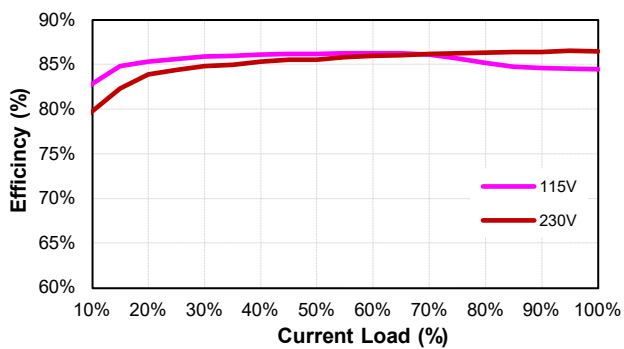
TRG1512 (Eff Vs Io)



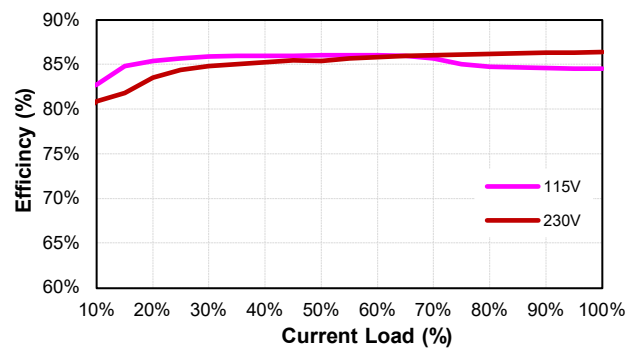
TRG1512-01 (Eff Vs Io)



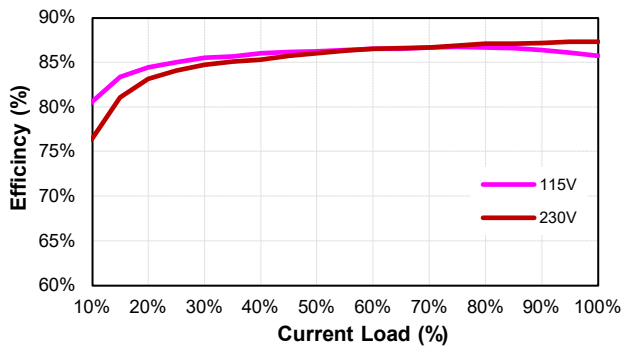
TRG1515 (Eff Vs Io)



TRG1518 (Eff Vs Io)



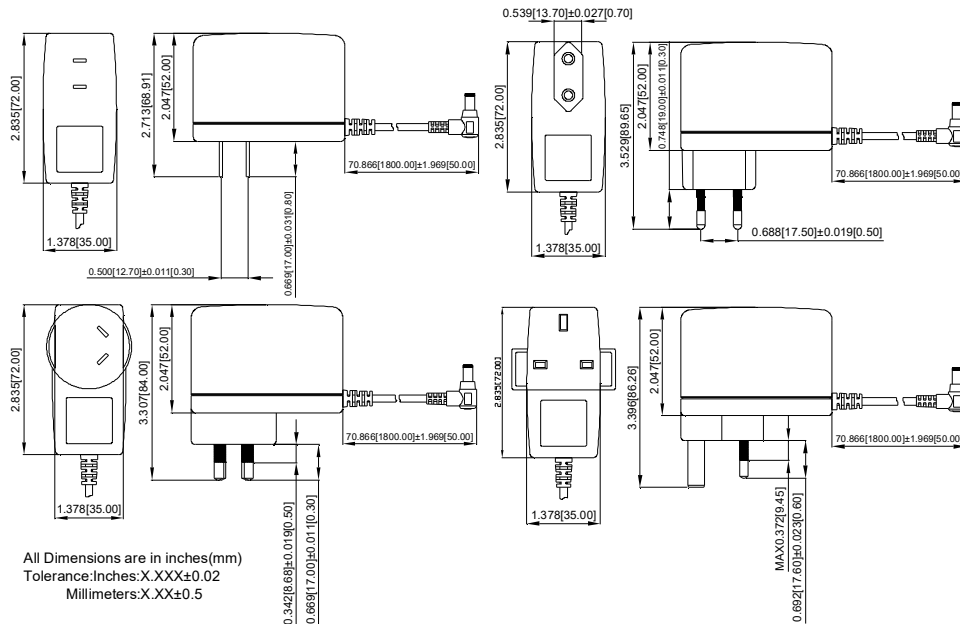
TRG1524 (Eff Vs Io)



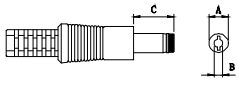
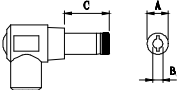
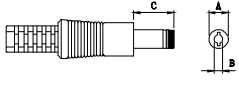
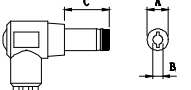


TRG15 Series

MECHANICAL SPECIFICATION



STANDARD OUTPUT PLUG

DC Plug Type	Cable Number -XXXXX	A	B	C	Cable Type	Cable Length	Cable AWG
		OD (mm)	ID (mm)	L (mm)			
 Straight/Inner+Outer- + ● -	11E03	Φ5.5	Φ2.1	12	UL1185	1800mm without Core	18AWG for Vo: 5V, 7.5V, 9V 20AWG for Vo: 12V, 13.6V, 15V, 18V, 24V
	12E03	Φ5.5	Φ2.5	12			
	23E03	Φ5.5	Φ2.1	9.5			
	26E03	Φ5.5	Φ2.5	9.5			
 Right Angle/Inner+Outer- + ● -	01E03	Φ5.5	Φ2.1	12			
	02E03	Φ5.5	Φ2.5	12			
	21E03	Φ5.5	Φ2.5	9.5			
	24E03	Φ5.5	Φ2.1	9.5			
 Straight/Inner+Outer- + ● -	11E02	Φ5.5	Φ2.1	12	UL1185	1220mm without Core	16AWG for Vo: 6V
	12E02	Φ5.5	Φ2.5	12			
	23E02	Φ5.5	Φ2.1	9.5			
	26E02	Φ5.5	Φ2.5	9.5			
 Right Angle/Inner+Outer- + ● -	01E02	Φ5.5	Φ2.1	12			
	02E02	Φ5.5	Φ2.5	12			
	21E02	Φ5.5	Φ2.5	9.5			
	24E02	Φ5.5	Φ2.1	9.5			

※Other DC Plug Type please refer to the link: <https://www.cincon.com/productdownload/TRG15-cable-DC-Plug.pdf>

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<u>TRG1505-U-12E03-Level-VI</u>	<u>TRG1507-A-01E03-Level-VI</u>	<u>TRG1509-A-11E03-Level-VI</u>	<u>TRG1512-A-11E03-Level-VI</u>
<u>TRG1505-E-11E03-Level-VI</u>	<u>TRG1512-A-36E03-Level-VI</u>	<u>TRG1507-A-12E03-Level-VI</u>	<u>TRG1507-U-02E03-Level-VI</u>
<u>TRG1512-A-35E03-Level-VI</u>	<u>TRG1515-E-01E03-Level-VI</u>	<u>TRG1505-A-12E03-Level-VI</u>	<u>TRG1515-U-11E03-Level-VI</u>
<u>TRG1509-S-12E03-Level-VI</u>	<u>TRG1524-E-01E03-Level-VI</u>	<u>TRG1518-S-12E03-Level-VI</u>	<u>TRG1509-U-02E03-Level-VI</u>
<u>TRG1515-U-12E03-Level-VI</u>	<u>TRG1518-E-01E03-Level-VI</u>	<u>TRG1509-E-02E03-Level-VI</u>	<u>TRG1512-A-02E03-Level-VI</u>
<u>TRG1512-S-12E03-Level-VI</u>	<u>TRG1518-E-11E03-Level-VI</u>	<u>TRG1512-A-39E03-Level-VI</u>	<u>TRG1509-E-12E03-Level-VI</u>
<u>TRG1506-U-01E02-Level-VI</u>	<u>TRG1512-01-A-12E03-Level-VI</u>	<u>TRG1505-S-01E03-Level-VI</u>	<u>TRG1505-U-01E03-Level-VI</u>
<u>TRG1507-E-12E03-Level-VI</u>	<u>TRG1507-U-01E03-Level-VI</u>	<u>TRG1512-A-12E03-Level-VI</u>	<u>TRG1518-U-11E03-Level-VI</u>
<u>TRG1524-U-01E03-Level-VI</u>	<u>TRG1524-A-01E03-Level-VI</u>	<u>TRG1524-E-12E03-Level-VI</u>	<u>TRG1524-S-12E03-Level-VI</u>
<u>TRG1518-A-02E03-Level-VI</u>	<u>TRG1507-S-01E03-Level-VI</u>	<u>TRG1515-E-02E03-Level-VI</u>	<u>TRG1524-S-01E03-Level-VI</u>
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<u>TRG1507-E-11E03-Level-VI</u>	<u>TRG1507-U-11E03-Level-VI</u>	<u>TRG1524-A-36E03-Level-VI</u>	<u>TRG1524-E-11E03-Level-VI</u>
<u>TRG1509-A-12E03-Level-VI</u>	<u>TRG1515-S-02E03-Level-VI</u>	<u>TRG1509-U-12E03-Level-VI</u>	<u>TRG1515-S-01E03-Level-VI</u>
<u>TRG1524-A-35E03-Level-VI</u>	<u>TRG1515-E-12E03-Level-VI</u>	<u>TRG1524-A-26E03-Level-VI</u>	<u>TRG1506-U-12E02-Level-VI</u>
<u>TRG1509-E-01E03-Level-VI</u>	<u>TRG1518-U-12E03-Level-VI</u>	<u>TRG1524-A-12E03-Level-VI</u>	<u>TRG1512-S-01E03-Level-VI</u>
<u>TRG1512-U-11E03-Level-VI</u>	<u>TRG1509-E-11E03-Level-VI</u>	<u>TRG1512-A-49E03-Level-VI</u>	<u>TRG1512-A-48E03-Level-VI</u>
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<u>TRG1507-A-11E03-Level-VI</u>	<u>TRG1507-S-12E03-Level-VI</u>	<u>TRG1524-A-11E03-Level-VI</u>	<u>TRG1518-U-02E03-Level-VI</u>
<u>TRG1524-A-39E03-Level-VI</u>	<u>TRG1512-U-12E03-Level-VI</u>	<u>TRG1505-S-11E03-Level-VI</u>	<u>TRG1509-A-02E03-Level-VI</u>
<u>TRG1506-A-11E02-Level-VI</u>	<u>TRG1506-E-12E02-Level-VI</u>	<u>TRG1515-U-02E03-Level-VI</u>	<u>TRG1507-A-02E03-Level-VI</u>
<u>TRG1515-A-12E03-Level-VI</u>	<u>TRG1518-A-12E03-Level-VI</u>	<u>TRG1524-U-12E03-Level-VI</u>	<u>TRG1506-S-01E02-Level-VI</u>
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<u>TRG1505-A-48E03-Level-VI</u>	<u>TRG1515-A-02E03-Level-VI</u>	<u>TRG1524-E-02E03-Level-VI</u>	<u>TRG1524-U-11E03-Level-VI</u>