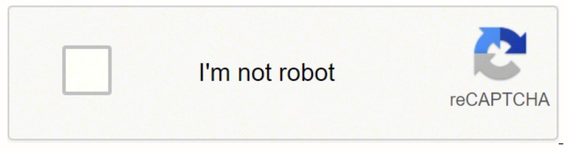

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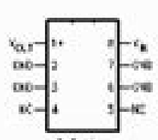
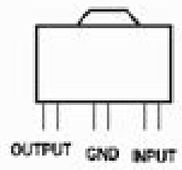
78L05 — Positive-Voltage Regulators

- 3-Terminal Regulators
- Output Current up to 100 mA
- No External Components
- Internal Thermal-Overload Protection
- Internal Short-Circuit Current Limiting
- Provided Pb-Free packages from the end of 2004



SO-8
78L05ACM

78L05ACZ-Bulk
78L05AGZM-Ammo
TO-92



SOT-89
78L05CPK

description

This series of fixed-voltage integrated-circuit voltage regulators is designed for a wide range of applications. These applications include on-card regulation for elimination of noise and distribution problems associated with single-point regulation. In addition, they can be used with power-pass elements to make high-current voltage regulators. One of these regulators can deliver up to 100 mA of output current. The internal limiting and thermal-shutdown features of these regulators make them essentially immune to overload. When used as a replacement for a zener diode-resistor combination, an effective improvement in output impedance can be obtained, together with lower bias current.

electrical characteristics at specified virtual junction temperature, V_I = 10 V, I_O= 40 mA (unless otherwise noted)

PARAMETER	TEST CONDITIONS	T ‡	78L05			UNIT
			MIN	TYP	MAX	
Output voltage		25°C	4.8	5	5.2	V
	I_O= 1mA to 40MA, V =7V to20V	Full range	4.75	5	5.25	
	I_O = 1 mA to 70 mA	Full range	4.75	5	5.25	
Input voltage regulation	V_I = 7 V to 20 V	25°C		32	150	mV
	V_I = 8 V to 20 V			26	100	
Ripple rejection	V_I = 8 V to 18 V, f = 120 Hz	25°C	41	49		dB
Output voltage regulation	I_O = 1 mA to 100 mA	25°C		15	60	mV
	I_O = 1 mA to 40 mA			8	30	
Output noise voltage	f = 10 Hz to 100 kHz	25°C		42		μV
Dropout voltage		25°C		1.7		V
Bias current		25°C		3.8	6	mA
		125°C			5.5	
Bias current change	V_I = 8 V to 20 V	Full range			1.5	mA
	I_O = 1 mA to 40 mA				0.1	

‡ Pulse-testing techniques maintain T_J as close to T_A as possible. Thermal effects must be taken into account separately. All characteristics are measured with a 0.33-μF capacitor across the input and a 0.1-μF capacitor across the output. Full range for the 78L05 is T_J = 0°C to 70°C.

CDIL
Continental Device India Limited
An ISO/TS 16949, ISO 9001 and ISO 14001 Certified Company

3-TERMINAL POSITIVE VOLTAGE REGULATOR — LM7805 — TO-220

Plastic Package

The Voltages Available allow these Regulators to be used in Logic Systems, Instrumentation, Hi-Fi, Audio Circuits and other Solid State Electronic Equipment

ABSOLUTE MAXIMUM RATINGS

DESCRIPTION	SYMBOL	VALUE	UNIT
Input Voltage	V_{IN}	35	V
Continuous Total Dissipation at T_A=25°C free air Temperature	P_D	2.0	W
Continuous Total Dissipation at T_C=25°C case Temperature	P_D	15	W
Operating free-air, case, or Virtual Junction Temperature Range	T_{OPR}	0 to 150	°C
Storage Temperature Range	T_{STG}	- 65 to +150	°C
Lead Temperature 1.6mm (1/16 inch) from Case for 10 seconds	T_L	260	°C

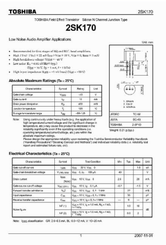
ELECTRICAL CHARACTERISTICS (T$_J$=25°C unless specified otherwise)

V_I=10V, I_O=500mA

DESCRIPTION	SYMBOL	TEST CONDITION		MIN	TYP	MAX	UNIT
Output Voltage	V_O		T_J=25°C	4.80		5.20	V
		I_O=5mA ~ 1A V_I=7V ~ 20V, P$_D$ ≤ 15W	T_J=0 ~ 125°C	4.75		5.25	V
Line Regulation	R_{EGV}	V_I=7.0 ~ 25V	T_J=25°C			100	mV
		V_I=8.0 ~ 12V				50	mV
Ripple Rejection	R_R	V_I=8.0 ~ 18V, f=120Hz	T_J=0 ~ 125°C	62			dB
Load Regulation	R_{EGL}	I_O=5mA ~ 1.5A	T_J=25°C			100	mV
		I_O=250mA ~ 750mA				50	mV
Output Resistance	R_O	f=1KHz	T_J=0 ~ 125°C		0.017		Ω
Output Voltage Drift	$\Delta V_O/\Delta T$	I_O=5mA	T_J=0 ~ 125°C		- 1.1		mV/°C
Output Noise Voltage	V_{NO}	f=10Hz ~ 100KHz	T_J=25°C		40		μV
Dropout Voltage	V_D	I_O=1A	T_J=25°C		2.0		V
Quiescent Current	I_Q		T_J=25°C			8.0	mA
Quiescent Current Change	ΔI_Q	V_I=7.0 ~ 25V	T_J=0 ~ 125°C			1.3	mA
		I_O=5mA ~ 1A				0.5	mA
Short Circuit Output Current	I_{SC}		T_J=25°C		750		mA
Peak Output Current	I_{PK}		T_J=25°C		2.2		A

LM7805Rev. 1.1 080905E

Continental Device India Limited — Data Sheet — Page 1 of 3



TOSHIBA — 2SK170

TOSHIBA Field Effect Transistor Silicon N Channel Junction Type

2SK170

Low Noise Audio Amplifier Applications

Unit: mm

- Recommended for first stage of MC and RIAA, head amplifiers.
- High $|Y_{fs}|$: $|Y_{fs}|$ = 13 mS (typ.) at V_{DS} = 10 V, I_D = 5 mA (Note 1 rank)
- Low noise: NF = 0.5 dB (typ.) at V_{DS} = 10 V, I_D = 0.5 mA, f = 100 Hz
- Low C_{iss}: C_{iss} = 16 pF (typ.) at V_{DS} = 10 V, I_D = 5 mA
- High $|Y_{fs}|$ / C_{iss}: $|Y_{fs}|$ / C_{iss} = 1.2 mS/pF (typ.) at V_{DS} = 10 V, I_D = 5 mA

Absolute Maximum Ratings (Ta = 25°C)

Characteristics	Symbol	Rating	Unit
Gate-drain voltage	V_{GDS}	−50	V
Gate current	I_G	10	mA
Drain power dissipation	P_D	400	mW
Junction temperature	T_j	125	°C
Storage temperature range	T_{stg}	−55 to 125	°C

Note: Using continuously under heavy loads (e.g. the application of high temperature/current/voltage and the significant change in temperature, etc.) may cause this product to decrease in the reliability significantly even if the operating conditions (i.e. operating temperature/current/voltage, etc.) are within the absolute maximum ratings.
Please design the appropriate reliability upon reviewing the Toshiba Semiconductor Reliability Handbook ("Handling Precautions"/"Derating Concept and Methods") and individual reliability data (i.e. reliability test report and estimated failure rate, etc).

Electrical Characteristics (Ta = 25°C)

Characteristics	Symbol	Test Condition	Min	Typ.	Max	Unit
Gate reverse current	I_{GSS}	V_{GS} = −30 V, V_{DS} = 0	—	—	−1.0	nA
Gate-drain breakdown voltage	$V_{(BR)GDS}$	I_G = −100 μA, V_{DS} = 0	−50	—	—	V
Gate cutoff voltage	$V_{GS(OFF)}$	V_{DS} = 10 V, I_D = 0.1 μA	−0.3	—	−2.0	V
Drain current (Note 1)	I_{DSS}	V_{DS} = 10 V, V_{GS} = 0	2.6	6.5	14	mA
Forward transfer admittance	$\|Y_{fs}\|$	V_{DS} = 10 V, I_D = 5 mA, f = 1 kHz	9.0	13	—	mS
Input capacitance	C_{iss}	V_{DS} = 10 V, V_{GS} = 0, f = 1 MHz	—	16	25	pF
Reverse transfer capacitance	C_{rss}	V_{DS} = 10 V, V_{GS} = 0, f = 1 MHz	—	4.5	8.0	pF
Noise figure	NF	V_{DS} = 10 V, I_D = 0.5 mA, R_G = 1 kΩ, f = 100 Hz	—	0.5	3.0	dB
		V_{DS} = 10 V, I_D = 0.5 mA, R_G = 1 kΩ, f = 1 kHz	—	0.5	3.0	

Note: I_{DSS} classification GR: 2.6–6.5 mA, BL: 6.0–14 mA, 2.6–14 mA

PROGRAMMABLE PRECISION SHUNT REGULATOR TL431/A/C

FEATURES

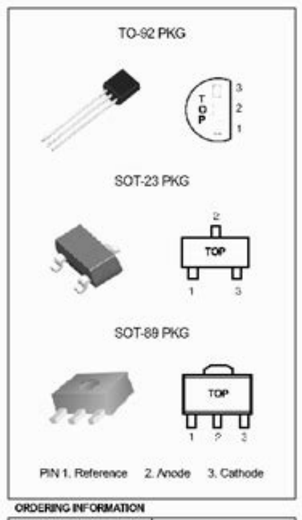
- Programmable Output Voltage to 40V
- Guaranteed 0.5% Reference Voltage Tolerance
- Low (0.2Ω Typ.) Dynamic Output Impedance
- Cathode Current Range(Continuous) – 100 ~ 150 mA
- Equivalent Full Range Temperature Coefficient of 50PPM/℃
- Temperature Compensated For Operation Over Full Rate Operating Temperature Range
- Low Output Noise Voltage
- Fast Turn-on Response
- TO-92, SOT-89 or SOT-23 3L Package

APPLICATION

- Shunt Regulator
- Precision High-Current Series Regulator
- High-Current Shunt Regulator
- Crowbar Circuit
- PWM Converter With Reference
- Voltage Monitor
- Precision Current Limiter

DESCRIPSION

The TL431 is a three-terminal adjustable shunt regulator with specified thermal stability over applicable temperature V_{REF} (Approx. 2.5V) and 40V with two external resistors. This device has a typical dynamic output impedance of 0.2Ω. Active output circuitry provides a very sharp turn-on characteristic, making this device excellent replacement for zener diodes in many applications. The TL431 is characterized for operation from -40℃ to +125℃.



PIN 1. Reference 2. Anode 3. Cathode

ORDERING INFORMATION

Device	Package
TL431	TO-92(Bulk)
TL431A	TO-92(Taping)
TL431SF	SOT-23 3L
TL431F	SOT-89 3L

* Refer to the page 2 for detailed ordering information.

Absolute Maximum Ratings

(Operating temperature range applies unless otherwise specified)

CHARACTERISTIC	SYMBOL	MIN.	MAX.	UNIT
Cathode Voltage	V_{KA}	-	42	V
Cathode Current Range(Continuous)	I_K	-100	150	mA
Reference Input Current Range	I_{REF}	-0.05	10	mA
Junction Temperature Range	T_J	-40	150	℃
Operating Temperature Range	T_{OPR}	-40	125	℃
Storage Temperature Range	T_{STG}	-65	150	℃

ST13007

HIGH VOLTAGE FAST-SWITCHING NPN POWER TRANSISTOR

- IMPROVED SPECIFICATION:
  - LOWER LEAKAGE CURRENT
  - TIGHTER GAIN RANGE
  - DC CURRENT GAIN PRESELECTION
  - TIGHTER STORAGE TIME RANGE
- HIGH VOLTAGE CAPABILITY
- NPN TRANSISTOR
- LOW SPREAD OF DYNAMIC PARAMETERS
- MINIMUM LOT-TO-LOT SPREAD FOR RELIABLE OPERATION
- VERY HIGH SWITCHING SPEED
- FULLY CHARACTERIZED AT 125 °C
- LARGE RBSOA

TO-220

APPLICATIONS

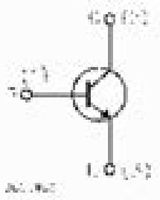
- ELECTRONIC BALLASTS FOR FLUORESCENT LIGHTING
- SWITCH MODE POWER SUPPLIES

DESCRIPTION

The device is manufactured using high voltage Multi Epitaxial Planar technology for high switching speeds and high voltage capability.

They use a Cellular Emitter structure to enhance switching speeds.

INTERNAL SCHEMATIC DIAGRAM



ABSOLUTE MAXIMUM RATINGS

Symbol	Parameter	Value	Unit
V_{CEV}	Collector-Emitter Voltage (V_{BE} = -1.5V)	700	V
V_{CEO}	Collector-Emitter Voltage (I_B = 0)	400	V
V_{EBO}	Emitter-Base Voltage (I_C = 0)	9	V
I_C	Collector Current	8	A
I_{CM}	Collector Peak Current	16	A
I_B	Base Current	4	A
I_{BM}	Base Peak Current	8	A
P_{tot}	Total Dissipation at $T_c \leq 25$ °C	80	W
T_{stg}	Storage Temperature	-65 to 150	°C
T_j	Max. Operating Junction Temperature	150	°C

Srt1000uxi-li.

OverviewPresentationHigh density, double-conversion on-line power protection with scalable runtime.Lead timeUsually in StockGeneralNumber of power module700Number of power module free slots0Number of power module filled slots0redundantNoPhysicalcolourBlackheight43.2 cmwidth8.5 cmdepth48.3 cmnet weight23 kgmounting locationFrontmounting preferenceLowermounting modeNot rack-mountabletwo post mountable0USB compatibleNoInputnetwork frequency50/60 Hz +/- 5 Hz auto-sensinginput voltage limits160...280 VOutputMaximum configurable power in W700 Wharmonic distortionLess than 3 %output frequency50/60 Hz +/- 3 Hz user adjustable +/- 0.1 Hz sync to mainscrest factor3 : 1UPS typeDouble conversion onlineWave typeSine wavebypass typeBuilt-in bypassMaximum configurable power in VA1000 VAConformanceproduct certificationsstandardsEN 50091-1EN 50091-2EN 55022 class AEN 60950EN 61000-3-2Environmentalambient air temperature for operation0…40 °Crelative humidity0…95 % non-condensingoperating altitude0...10000 ftambient air temperature for storage-20…50 °Cstorage Relative Humidity0…95 % Non-condensingstorage altitude0.00…15240.00 macoustic level50 dBAheat dissipation324 Btu/hIP degree of protectionIP20Batteries & RuntimeRun TimeView Runtime Graphaction_new_windowEfficiencyView Efficiency Graphaction_new_windownumber of battery filled slots1number of battery free slots0Battery recharge time3 hnumber of battery replacement quantity1additional informationConfigurable for 220 : 230 or 240 nominal output voltagebattery charger power109 W ratedBattery power in VAH328 VAh runtimebattery life3…5 year(s)battery optionSURT48XLBP 1 984 VAhSURT48XLBP 2 1640 VAhSURT48XLBP 3 2296 VAhSURT48XLBP 4 2952 VAhSURT48XLBP 5 3608 VAhSURT48XLBP 6 4264 VAhSURT48XLBP 8 5576 VAhSURT48XLBP 10 6888 VAhextended runtime1Communications & Managementfree slots1control panelLED status display with load and battery bar-graphs and on line : on battery : replace battery : overload and bypass indicatorsalarmAlarm when on battery : distinctive low battery alarm : overload continuous tone alarmEmergency power offOptionalSurge Protection and FilteringSurge energy rate420 Jnoise suppressionFull time multi-pole noise filtering : 0.3% IEEE surge let-through : zero clamping response time : meets UL 1449Packing UnitsPackage 1 Weight27.8 kgPackage 1 Height28.6 cmPackage 1 width63 cmPackage 1 Length59.4 cmNumber of Units in Package 21Number of Units in Package 36Contractual warrantyWarranty2 years repair or replace, optional on-site warranties available, optional extended warranties available Green PremiumTM label is Schneider Electric’s commitment to delivering products with best-in-class environmental performance. APC may also be known as the following names:American Power ConversionAPC BY SCHNEIDER ELECTRICAPC-K14AMERICAN POWER CONVEAmerican Power Conversion (APC)ApccAMERICAN POWER CONVAmerican Power Conversion CorpAPC BY SCHNEIDERAPC-AMERICAN POWER CONVERSIONAPC ACCT# 1524APC - Schneider ElectricAPC - LA/CAMERICAN POWER CONVERSIONSApc SchneiderAPC BY SCHNEIDER ELECTRONICSchneider Electric / American Power Conversion (APC) Model Description: APC Smart-UPS RT 1000VA SURT1000XLI Compatible Replacement Battery Set Compatibility: SURT1000XLI Condition: New, Fresh Stock Includes: (4) SURT1000XLI Compatible Replacement Batteries Warranty: 1 year full replacement warranty included, additional warranty is available Life time expectancy: 3-5 years Manufacturer: UPS Battery Center Ltd. The SURT1000XLI replacement battery set is covered by our industry leading 1 year replacement warranty. Green Premium promises compliance with the latest regulations, transparency on environmental impacts, as well as circular and low-CO2 products.Learn morearrow2_leftTake-back program availableRoHS exemption information Easily find answers to the most frequently asked questions. Green Premium promises compliance with the latest regulations, transparency on environmental impacts, as well as circular and low-CO2 products.Learn morearrow2_leftTake-back program availableRoHS exemption information APC SURT1000XLI technical specifications, attributes, and parameters.PhysicalWeight23 kgTechnicalInterfaceRS-232Max Frequency60 HzMax Operating Temperature40 °CMin Operating Temperature0 °COutput Power700 WOutput Voltage230 VPower Rating700 WDimensionsDepth483 mmHeight85 mmLength85 mmWidth432 mmComplianceRoHSCompliantDownload datasheets and manufacturer documentation for APC SURT1000XLI.NewarkDatasheet3 pages5 years agoDescriptions of APC SURT1000XLI provided by its distributors.APC BY SCHNEIDER ELECTRIC SURT1000XLI APC SMART UPS RACK MOUNT,1000VA UPSSmart-Ups Rt1000Va Extended-Run Black Rack/Tower InUPS, 700W, 230V, 6x IEC 60320 C13APC SURT1000XLI 1000VA 700W 230VUps, 230V, 700W; Power Supply Approvals:ite; No. Of Outlets:8Outlets; Capacity (Va / W):1Kva / 700W; Input Voltage Ac Max:280V; Output Voltage:230Vac; Backup Time - Full Load:4Min; Product Range:-; Length:483Mm; Width:85Mm Rohs Compliant: YesAPC has several brands around the world that distributors may use as alternate names. Extended warranty of up to 3 years is available for your convenience. Our warranty is inclusive of shipping costs and is hassle free, the only warranty of this kind in the marketplace. Our batteries are new and always fresh stock. APC® is a registered trademark of Schneider Electric IT Corporation. ® The APC SURT1000XLI compatible replacement battery set consists of high quality UPS Battery Center manufactured batteries that are designed to provide excellent performance and long life in UPS devices. PartSURT1000XLI CategoryPower & Line Protection => Uninterruptible Power Supplies (UPS) TitleUPS, 230V, 700W Description CompanyAPC Specifications Capacity (VA / W)1000VA / 700W No. of Outlets8 Input Voltage Range VAC160V to 280V Input Voltage Range VDC- Output Voltage230VAC Backup Time - Full Load4min Length483mm Width85mm Height432mm Plug Type- Some Part number from the same manufacture APC SURT2000UXI Specifications: Capacity (VA / W): 2000VA / 1400W ; No. of Outlets: 9 ; Input Voltage Range VAC: 160V to 280V ; Input Voltage Range VDC: - ; Output Voltage: 230VAC ; Backup Time - Full Load: 21min ; Length: SURTA1500XL Specifications: Capacity (VA / W): 1500VA / 1050W ; No. of Outlets: 6 ; Input Voltage Range VAC: 90V to 150V ; Input Voltage Range VDC: - ; Output Voltage: 120VAC ; Backup Time - Full Load: 9min ; Length: SURTA2000XL Specifications: Capacity (VA / W): 2000VA / 14000W ; No. of Outlets: 6 ; Input Voltage Range VAC: 90V to 150V ; Input Voltage Range VDC: - ; Output Voltage: 120VAC ; Backup Time - Full Load: 5min ; Length: SURTD5000XLT Specifications: Capacity (VA / W): 5000VA / 3500W ; No. of Outlets: 4 ; Input Voltage Range VAC: 160V to 280V ; Input Voltage Range VDC: - ; Output Voltage: 208VAC ; Backup Time - Full Load: 5min ; Length: AP9870 BR550GI SUA2200RMXL3U SUA3000RMXL3U RBC33 Specifications: Battery Size Code: - ; Battery Capacity: - ; Battery Voltage: 12V ; Battery Technology: Lead Acid ; External Diameter: - ; External Height: 197mm ; External Width: 149mm ; External Depth: RBC12 SMX120RMBP2U Specifications: Battery Size Code: - ; Battery Capacity: 10Ah ; Battery Voltage: 120V ; Battery Technology: Lead Acid ; External Diameter: - ; External Height: 85mm ; External Width: 432mm ; External Depth: SUA48RMXLBP3U Specifications: Battery Size Code: - ; Battery Capacity: - ; Battery Voltage: 48V ; Battery Technology: Lead Acid ; External Diameter: - ; External Height: 133mm ; External Width: 483mm ; External Depth: SUA48XLBP RBC11 Specifications: Battery Size Code: - ; Battery Capacity: - ; Battery Voltage: - ; Battery Technology: - ; External Diameter: - ; External Height: - ; External Width: - ; External Depth: - ; Weight: - ; Battery RBC14 RBC18 RBC9 OverviewPresentationHigh density, double-conversion on-line power protection with scalable runtime.Lead timeUsually in StockGeneralNumber of power module700Number of power module free slots0Number of power module filled slots0redundantNoPhysicalcolourBlackheight43.2 cmwidth8.5 cmdepth48.3 cmnet weight23 kgmounting locationFrontmounting preferenceLowermounting modeNot rack-mountabletwo post mountable0USB compatibleNoInputnetwork frequency50/60 Hz +/- 5 Hz auto-sensinginput voltage limits160...280 VOutputMaximum configurable power in W700 Wharmonic distortionLess than 3 %output frequency50/60 Hz +/- 3 Hz user adjustable +/- 0.1 Hz sync to mainscrest factor3 : 1UPS typeDouble conversion onlineWave typeSine wavebypass typeBuilt-in bypassMaximum configurable power in VA1000 VAConformanceproduct certificationsstandardsEN 50091-1EN 50091-2EN 55022 class AEN 60950EN 61000-3-2Environmentalambient air temperature for operation0…40 °Crelative humidity0…95 % non-condensingoperating altitude0...10000 ftambient air temperature for storage-20…50 °Cstorage Relative Humidity0…95 % Non-condensingstorage altitude0.00…15240.00 macoustic level50 dBAheat dissipation324 Btu/hIP degree of protectionIP20Batteries & RuntimeRun TimeView Runtime Graphaction_new_windowEfficiencyView Efficiency Graphaction_new_windownumber of battery filled slots1number of battery free slots0Battery recharge time3 hnumber of battery replacement quantity1additional informationConfigurable for 220 : 230 or 240 nominal output voltagebattery charger power109 W ratedBattery power in VAH328 VAh runtimebattery life3…5 year(s)battery optionSURT48XLBP 1 984 VAhSURT48XLBP 2 1640 VAhSURT48XLBP 3 2296 VAhSURT48XLBP 4 2952 VAhSURT48XLBP 5 3608 VAhSURT48XLBP 6 4264 VAhSURT48XLBP 8 5576 VAhSURT48XLBP 10 6888 VAhextended runtime1Communications & Managementfree slots1control panelLED status display with load and battery bar-graphs and on line : on battery : replace battery : overload and bypass indicatorsalarmAlarm when on battery : distinctive low battery alarm : overload continuous tone alarmEmergency power offOptionalSurge Protection and FilteringSurge energy rate420 Jnoise suppressionFull time multi-pole noise filtering : 0.3% IEEE surge let-through : zero clamping response time : meets UL 1449Packing UnitsPackage 1 Weight27.742 kgPackage 1 Height28.575 cmPackage 1 width63.043 cmPackage 1 Length59.385 cmNumber of Units in Package 21Number of Units in Package 36Contractual warrantyWarranty2 years repair or replace, optional on-site warranties available, optional extended warranties available Green PremiumTM label is Schneider Electric’s commitment to delivering products with best-in-class environmental performance. 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