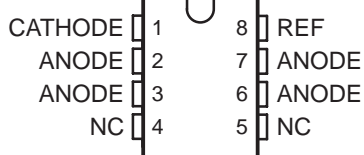


TL431, TL431A, TL431B TL432, TL432A, TL432B ADJUSTABLE PRECISION SHUNT REGULATORS

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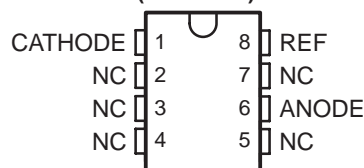
- Operation From -40°C to 125°C
- Reference Voltage Tolerance at 25°C
 - 0.5% . . . B Grade
 - 1% . . . A Grade
 - 2% . . . Standard Grade
- Typical Temperature Drift (TL431B)
 - 6 mV (C Temp)
 - 14 mV (I Temp, Q Temp)
- Low Output Noise
- 0.2- Ω Typical Output Impedance
- Sink-Current Capability . . . 1 mA to 100 mA
- Adjustable Output Voltage . . . V_{ref} to 36 V

TL431, TL431A, TL431B . . . D (SOIC) PACKAGE
(TOP VIEW)



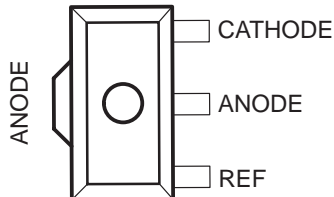
NC – No internal connection

TL431, TL431A, TL431B . . . P (PDIP), PS (SOP),
OR PW (TSSOP) PACKAGE
(TOP VIEW)

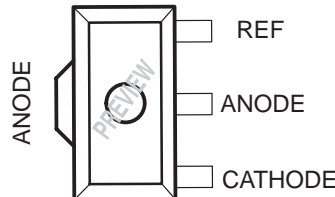


NC – No internal connection

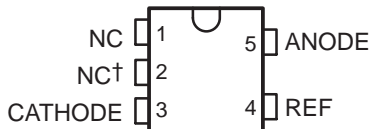
TL431, TL431A, TL431B . . . PK (SOT-89) PACKAGE
(TOP VIEW)



TL432, TL432A, TL432B . . . PK (SOT-89) PACKAGE
(TOP VIEW)



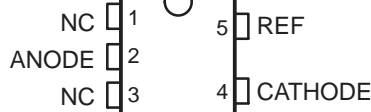
TL431, TL431A, TL431B . . . DBV (SOT-23-5) PACKAGE
(TOP VIEW)



NC – No internal connection

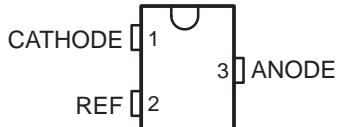
† Pin 2 is connected internally to ANODE (die substrate) and should be floating or connected to ANODE.

TL432, TL432A, TL432B . . . DBV (SOT-23-5) PACKAGE
(TOP VIEW)

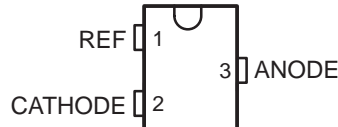


NC – No internal connection

TL431, TL431A, TL431B . . . DBZ (SOT-23-3) PACKAGE
(TOP VIEW)



TL432, TL432A, TL432B . . . DBZ (SOT-23-3) PACKAGE
(TOP VIEW)



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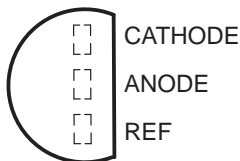
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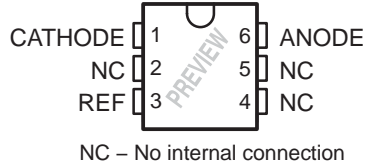
TL431, TL431A, TL431B TL432, TL432A, TL432B ADJUSTABLE PRECISION SHUNT REGULATORS

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TL431, TL431A, TL431B . . . LP (TO-92/TO-226) PACKAGE
(TOP VIEW)

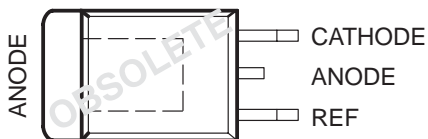


TL431A, TL431B . . . DCK (SC-70) PACKAGE
(TOP VIEW)



NC – No internal connection

TL431 . . . KTP (PowerFLEX™/TO-252) PACKAGE
(TOP VIEW)



description/ordering information

The TL431 and TL432 are three-terminal adjustable shunt regulators, with specified thermal stability over applicable automotive, commercial, and military temperature ranges. The output voltage can be set to any value between V_{ref} (approximately 2.5 V) and 36 V, with two external resistors (see Figure 17). These devices have a typical output impedance of 0.2 Ω . Active output circuitry provides a very sharp turn-on characteristic, making these devices excellent replacements for Zener diodes in many applications, such as onboard regulation, adjustable power supplies, and switching power supplies. The TL432 has exactly the same functionality and electrical specifications as the TL431, but has different pinouts for the DBV, DBZ, and PK packages.

Both the TL431 and TL432 devices are offered in three grades, with initial tolerances (at 25°C) of 0.5%, 1%, and 2%, for the B, A, and standard grade, respectively. In addition, low output drift vs temperature ensures good stability over the entire temperature range.

The TL43xxC devices are characterized for operation from 0°C to 70°C, the TL43xxI devices are characterized for operation from –40°C to 85°C, and the TL43xxQ devices are characterized for operation from –40°C to 125°C.

TL431, TL431A, TL431B
TL432, TL432A, TL432B
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V_{ref} TOLERANCE (25°C) = 2%
TL431, TL432 ORDERING INFORMATION

T _A	PACKAGE†		ORDERABLE PART NUMBER	TOP-SIDE MARKING‡
0°C to 70°C	PDIP (P)	Tube of 50	TL431CP	TL431CP
	SOIC (D)	Tube of 75	TL431CD	TL431C
		Reel of 2500	TL431CDR	
	SOP (PS)	Reel of 2000	TL431CPSR	T431
	SOT-23-5 (DBV)	Reel of 3000	TL431CDBVR	T3C_
			TL431CDBVT	
		Reel of 250	TL432CDBVR	T4C_
			TL432CDBVT	
	SOT-23-3 (DBZ)	Reel of 3000	TL431CDBZR	T3C_
			TL431CDBZT	
		Reel of 250	TL432CDBZR	T4C_
			TL432CDBZT	
	SOT-89 (PK)	Reel of 1000	TL431CPK	43
			TL432CPK	PREVIEW
	TO-226/TO-92 (LP)	Bulk of 1000	TL431CLP	TL431C
		Ammo of 2000	TL431CLPM	
Reel of 2000		TL431CLPR		
TSSOP (PW)	Tube of 150	TL431CPW	T431	
	Reel of 2000	TL431CPWR		
-40°C to 85°C	PDIP (P)	Tube of 50	TL431IP	TL431IP
	SOIC (D)	Tube of 75	TL431ID	TL431I
		Reel of 2500	TL431IDR	
	SOT-23-5 (DBV)	Reel of 3000	TL431IDBVR	T3I_
			TL431IDBVT	
		Reel of 250	TL432IDBVR	T4I_
			TL432IDBVT	
	SOT-23-3 (DBZ)	Reel of 3000	TL431IDBZR	T3I_
			TL431IDBZT	
		Reel of 250	TL432IDBZR	T4I_
			TL432IDBZT	
	SOT-89 (PK)	Reel of 1000	TL431IPK	3I
			TL432IPK	PREVIEW
	TO-226/TO-92 (LP)	Bulk of 1000	TL431ILP	TL431I
		Reel of 2000	TL431ILPR	

† Package drawings, standard packing quantities, thermal data, symbolization, and PCB design guidelines are available at www.ti.com/sc/package.

‡ DBV/DBZ: The actual top-side marking has one additional character that designates the assembly/test site.



TL431, TL431A, TL431B
TL432, TL432A, TL432B
ADJUSTABLE PRECISION SHUNT REGULATORS

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V_{ref} TOLERANCE (25°C) = 2%
TL431, TL432 ORDERING INFORMATION

T_A	PACKAGE†		ORDERABLE PART NUMBER	TOP-SIDE MARKING‡
-40°C to 125°C	SOT-23-5 (DBV)	Reel of 3000	TL431QDBVR	T3Q_
		Reel of 250	TL431QDBVT	
		Reel of 3000	TL432QDBVR	T4Q_
		Reel of 250	TL432QDBVT	
	SOT-23-3 (DBZ)	Reel of 3000	TL431QDBZR	T3Q_
		Reel of 250	TL431QDBZT	
		Reel of 3000	TL432QDBZR	T4Q_
		Reel of 250	TL432QDBZT	
	SOT-89 (PK)	Reel of 1000	TL431QPK	PREVIEW
			TL432QPK	
	SC-70 (DCK)	Reel of 1000	TL431QDCKR	PREVIEW
			Reel of 250	

† Package drawings, standard packing quantities, thermal data, symbolization, and PCB design guidelines are available at www.ti.com/sc/package.

‡ DBV/DBZ: The actual top-side marking has one additional character that designates the assembly/test site.



TL431, TL431A, TL431B
TL432, TL432A, TL432B
ADJUSTABLE PRECISION SHUNT REGULATORS

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V_{ref} TOLERANCE (25°C) = 1%
TL431A, TL432A ORDERING INFORMATION

T _A	PACKAGE†		ORDERABLE PART NUMBER	TOP-SIDE MARKING‡
0°C to 70°C	PDIP (P)	Tube of 50	TL431ACP	TL431ACP
	SC-70 (DCK)	Reel of 3000	TL431ACDCKR	PREVIEW
		Reel of 250	TL431ACDCKT	
	SOIC (D)	Tube of 75	TL431ACD	431AC
		Reel of 2500	TL431ACDR	
	SOP (PS)	Reel of 2000	TL431ACPSR	T431A
	SOT-23-5 (DBV)	Reel of 3000	TL431ACDBVR	TAC_
		Reel of 250	TL431ACDBVT	
		Reel of 3000	TL432ACDBVR	T4B_
		Reel of 250	TL432ACDBVT	
	SOT-23-3 (DBZ)	Reel of 3000	TL431ACDBZR	TAC_
		Reel of 250	TL431ACDBZT	
		Reel of 3000	TL432ACDBZR	T4B_
		Reel of 250	TL432ACDBZT	
	SOT-89 (PK)	Reel of 1000	TL431ACPK	4A
			TL432ACPK	PREVIEW
	TO-226/TO-92 (LP)	Bulk of 1000	TL431ACLP	TL431AC
		Ammo of 2000	TL431ACLPM	
		Reel of 2000	TL431ACLPR	
		Reel of 2000	TL431ACLPRE3	
TSSOP (PW)	Tube of 150	TL431ACPW	T431A	
	Reel of 2000	TL431ACPWR		

† Package drawings, standard packing quantities, thermal data, symbolization, and PCB design guidelines are available at www.ti.com/sc/package.

‡ DBV/DBZ/DCK: The actual top-side marking has one additional character that designates the assembly/test site.



TL431, TL431A, TL431B
TL432, TL432A, TL432B
ADJUSTABLE PRECISION SHUNT REGULATORS

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V_{ref} TOLERANCE (25°C) = 0.5%
TL431B, TL432B ORDERING INFORMATION

T_A	PACKAGE†		ORDERABLE PART NUMBER	TOP-SIDE MARKING‡
0°C to 70°C	PDIP (P)	Tube of 50	TL431BCP	TL431BCP
	SC-70 (DCK)	Reel of 3000	TL431BCDCKR	PREVIEW
		Reel of 250	TL431BCDCKT	
	SOIC (D)	Tube of 75	TL431BCD	T431B
		Reel of 2500	TL431BCDR	
	SOP (PS)	Reel of 2000	TL431BCPSR	TL431B
	SOT-23-5 (DBV)	Reel of 3000	TL431BCDBVR	T3G_
		Reel of 250	TL431BCDBVT	
		Reel of 3000	TL432BCDBVR	TBC_
		Reel of 250	TL432BCDBVT	
	SOT-23-3 (DBZ)	Reel of 3000	TL431BCDBZR	T3G_
		Reel of 250	TL431BCDBZT	
		Reel of 3000	TL432BCDBZR	TBC_
		Reel of 250	TL432BCDBZT	
	SOT-89 (PK)	Reel of 1000	TL431BCPK	PREVIEW
			TL432BCPK	
	TO-226/TO-92 (LP)	Bulk of 1000	TL431BCLP	TL431B
		Ammo of 2000	TL431BCLPM	
Reel of 2000		TL431BCLPR		
TSSOP (PW)	Tube of 150	TL431BCPW	T431B	
	Reel of 2000	TL431BCPWR		
-40°C to 85°C	PDIP (P)	Tube of 50	TL431BIP	TL431BIP
	SC-70 (DCK)	Reel of 3000	TL431BIDCKR	PREVIEW
		Reel of 250	TL431BIDCKT	
	SOIC (D)	Tube of 75	TL431BID	Z431B
		Reel of 2500	TL431BIDR	
	SOT-23-5 (DBV)	Reel of 3000	TL431BIDBVR	T3F_
		Reel of 250	TL431BIDBVT	
		Reel of 3000	TL432BIDBVR	T4F_
		Reel of 250	TL432BIDBVT	
	SOT-23-3 (DBZ)	Reel of 3000	TL431BIDBZR	T3F_
		Reel of 250	TL431BIDBZT	
		Reel of 3000	TL432BIDBZR	T4F_
		Reel of 250	TL432BIDBZT	
	SOT-89 (PK)	Reel of 1000	TL431BIPK	PREVIEW
			TL432BIPK	
	TO-226/TO-92 (LP)	Bulk of 1000	TL431BILP	Z431B
		Reel of 2000	TL431BILPR	

† Package drawings, standard packing quantities, thermal data, symbolization, and PCB design guidelines are available at www.ti.com/sc/package.

‡ DBV/DBZ/DCK: The actual top-side marking has one additional character that designates the assembly/test site.

TL431, TL431A, TL431B
TL432, TL432A, TL432B
ADJUSTABLE PRECISION SHUNT REGULATORS

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electrical characteristics over recommended operating conditions, $T_A = 25^\circ\text{C}$ (unless otherwise noted)

PARAMETER	TEST CIRCUIT	TEST CONDITIONS	TL431AC TL432AC			UNIT
			MIN	TYP	MAX	
V_{ref} Reference voltage	2	$V_{\text{KA}} = V_{\text{ref}}, I_{\text{KA}} = 10 \text{ mA}$	2470	2495	2520	mV
$V_{\text{I(dev)}}$ Deviation of reference voltage over full temperature range (see Figure 1)	2	$V_{\text{KA}} = V_{\text{ref}}, I_{\text{KA}} = 10 \text{ mA}, T_A = 0^\circ\text{C} \text{ to } 70^\circ\text{C}$	SOT23-3, SC-70, and TL432 devices	6	16	mV
			All other devices	4	25	
$\frac{\Delta V_{\text{ref}}}{\Delta V_{\text{KA}}}$ Ratio of change in reference voltage to the change in cathode voltage	3	$I_{\text{KA}} = 10 \text{ mA}$	$\Delta V_{\text{KA}} = 10 \text{ V} - V_{\text{ref}}$	-1.4	-2.7	$\frac{\text{mV}}{\text{V}}$
			$\Delta V_{\text{KA}} = 36 \text{ V} - 10 \text{ V}$	-1	-2	
I_{ref} Reference current	3	$I_{\text{KA}} = 10 \text{ mA}, R1 = 10 \text{ k}\Omega, R2 = \infty$	2	4	μA	
$I_{\text{I(dev)}}$ Deviation of reference current over full temperature range (see Figure 1)	3	$I_{\text{KA}} = 10 \text{ mA}, R1 = 10 \text{ k}\Omega, R2 = \infty, T_A = 0^\circ\text{C} \text{ to } 70^\circ\text{C}$	0.8	1.2	μA	
I_{min} Minimum cathode current for regulation	2	$V_{\text{KA}} = V_{\text{ref}}$	0.4	0.6	mA	
I_{off} Off-state cathode current	4	$V_{\text{KA}} = 36 \text{ V}, V_{\text{ref}} = 0$	0.1	0.5	μA	
$ z_{\text{KA}} $ Dynamic impedance (see Figure 1)	1	$I_{\text{KA}} = 1 \text{ mA} \text{ to } 100 \text{ mA}, V_{\text{KA}} = V_{\text{ref}}, f \leq 1 \text{ kHz}$	0.2	0.5	Ω	

electrical characteristics over recommended operating conditions, $T_A = 25^\circ\text{C}$ (unless otherwise noted)

PARAMETER	TEST CIRCUIT	TEST CONDITIONS	TL431AI TL432AI			UNIT
			MIN	TYP	MAX	
V_{ref} Reference voltage	2	$V_{\text{KA}} = V_{\text{ref}}, I_{\text{KA}} = 10 \text{ mA}$	2470	2495	2520	mV
$V_{\text{I(dev)}}$ Deviation of reference voltage over full temperature range (see Figure 1)	2	$V_{\text{KA}} = V_{\text{ref}}, I_{\text{KA}} = 10 \text{ mA}, T_A = -40^\circ\text{C} \text{ to } 85^\circ\text{C}$	SOT23-3, SC-70, and TL432 devices	14	34	mV
			All other packages	5	50	
$\frac{\Delta V_{\text{ref}}}{\Delta V_{\text{KA}}}$ Ratio of change in reference voltage to the change in cathode voltage	3	$I_{\text{KA}} = 10 \text{ mA}$	$\Delta V_{\text{KA}} = 10 \text{ V} - V_{\text{ref}}$	-1.4	-2.7	$\frac{\text{mV}}{\text{V}}$
			$\Delta V_{\text{KA}} = 36 \text{ V} - 10 \text{ V}$	-1	-2	
I_{ref} Reference current	3	$I_{\text{KA}} = 10 \text{ mA}, R1 = 10 \text{ k}\Omega, R2 = \infty$	2	4	μA	
$I_{\text{I(dev)}}$ Deviation of reference current over full temperature range (see Figure 1)	3	$I_{\text{KA}} = 10 \text{ mA}, R1 = 10 \text{ k}\Omega, R2 = \infty, T_A = -40^\circ\text{C} \text{ to } 85^\circ\text{C}$	0.8	2.5	μA	
I_{min} Minimum cathode current for regulation	2	$V_{\text{KA}} = V_{\text{ref}}$	0.4	0.7	mA	
I_{off} Off-state cathode current	4	$V_{\text{KA}} = 36 \text{ V}, V_{\text{ref}} = 0$	0.1	0.5	μA	
$ z_{\text{KA}} $ Dynamic impedance (see Figure 1)	2	$I_{\text{KA}} = 1 \text{ mA} \text{ to } 100 \text{ mA}, V_{\text{KA}} = V_{\text{ref}}, f \leq 1 \text{ kHz}$	0.2	0.5	Ω	



PACKAGING INFORMATION

Orderable Device	Status ⁽¹⁾	Package Type	Package Drawing	Pins	Package Qty	Eco Plan ⁽²⁾	Lead/Ball Finish	MSL Peak Temp ⁽³⁾
TL431ACD	ACTIVE	SOIC	D	8	75	Pb-Free (RoHS)	CU NIPDAU	Level-2-260C-1 YEAR/ Level-1-235C-UNLIM
TL431ACDBVR	ACTIVE	SOT-23	DBV	5	3000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
TL431ACDBVRG4	ACTIVE	SOT-23	DBV	5	3000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
TL431ACDBVT	ACTIVE	SOT-23	DBV	5	250	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
TL431ACDBZR	ACTIVE	SOT-23	DBZ	3	3000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
TL431ACDBZRG4	ACTIVE	SOT-23	DBZ	3	3000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
TL431ACDBZT	ACTIVE	SOT-23	DBZ	3	250	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
TL431ACDBZTG4	ACTIVE	SOT-23	DBZ	3	250	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
TL431ACDCKR	ACTIVE	SC70	DCK	6	3000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
TL431ACDCKT	ACTIVE	SC70	DCK	6	250	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
TL431ACDR	ACTIVE	SOIC	D	8	2500	Pb-Free (RoHS)	CU NIPDAU	Level-2-260C-1 YEAR/ Level-1-235C-UNLIM
TL431ACLP	ACTIVE	TO-92	LP	3	1000	TBD	CU SNPB	Level-NC-NC-NC
TL431ACLPM	ACTIVE	TO-92	LP	3	2000	TBD	CU SNPB	Level-NC-NC-NC
TL431ACLPR	ACTIVE	TO-92	LP	3	2000	TBD	CU SNPB	Level-NC-NC-NC
TL431ACP	ACTIVE	PDIP	P	8	50	Pb-Free (RoHS)	CU NIPDAU	Level-NC-NC-NC
TL431ACPK	ACTIVE	SOT-89	PK	3	1000	TBD	CU SNBI	Level-1-220C-UNLIM
TL431ACPSR	ACTIVE	SO	PS	8	2000	Pb-Free (RoHS)	CU NIPDAU	Level-2-260C-1 YEAR/ Level-1-235C-UNLIM
TL431ACPW	ACTIVE	TSSOP	PW	8	150	Pb-Free (RoHS)	CU NIPDAU	Level-1-250C-UNLIM
TL431ACPWE4	ACTIVE	TSSOP	PW	8	150	Pb-Free (RoHS)	CU NIPDAU	Level-1-250C-UNLIM
TL431ACPWR	ACTIVE	TSSOP	PW	8	2000	Pb-Free (RoHS)	CU NIPDAU	Level-1-250C-UNLIM
TL431AID	ACTIVE	SOIC	D	8	75	Pb-Free (RoHS)	CU NIPDAU	Level-2-260C-1 YEAR/ Level-1-235C-UNLIM
TL431AIDBVR	ACTIVE	SOT-23	DBV	5	3000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
TL431AIDBVT	ACTIVE	SOT-23	DBV	5	250	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
TL431AIDBZR	ACTIVE	SOT-23	DBZ	3	3000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
TL431AIDBZRG4	ACTIVE	SOT-23	DBZ	3	3000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
TL431AIDBZT	ACTIVE	SOT-23	DBZ	3	250	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
TL431AIDBZTG4	ACTIVE	SOT-23	DBZ	3	250	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM

Orderable Device	Status ⁽¹⁾	Package Type	Package Drawing	Pins	Package Qty	Eco Plan ⁽²⁾	Lead/Ball Finish	MSL Peak Temp ⁽³⁾
						no Sb/Br)		
TL431AIDCKR	ACTIVE	SC70	DCK	6	3000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
TL431AIDCKT	ACTIVE	SC70	DCK	6	250	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
TL431AIDR	ACTIVE	SOIC	D	8	2500	Pb-Free (RoHS)	CU NIPDAU	Level-2-260C-1 YEAR/ Level-1-235C-UNLIM
TL431AILP	ACTIVE	TO-92	LP	3	1000	TBD	CU SNPB	Level-NC-NC-NC
TL431AILPM	ACTIVE	TO-92	LP	3	2000	TBD	CU SNPB	Level-NC-NC-NC
TL431AILPR	ACTIVE	TO-92	LP	3	2000	TBD	CU SNPB	Level-NC-NC-NC
TL431AIP	ACTIVE	PDIP	P	8	50	Pb-Free (RoHS)	CU NIPDAU	Level-NC-NC-NC
TL431AIPK	ACTIVE	SOT-89	PK	3	1000	TBD	CU SNBI	Level-1-220C-UNLIM
TL431AQDBVR	ACTIVE	SOT-23	DBV	5	3000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
TL431AQDBVT	ACTIVE	SOT-23	DBV	5	250	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
TL431AQDBZR	ACTIVE	SOT-23	DBZ	3	3000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
TL431AQDBZRG4	ACTIVE	SOT-23	DBZ	3	3000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
TL431AQDBZT	ACTIVE	SOT-23	DBZ	3	250	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
TL431AQDBZTG4	ACTIVE	SOT-23	DBZ	3	250	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
TL431AQDCKR	ACTIVE	SC70	DCK	6	3000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
TL431AQDCKT	ACTIVE	SC70	DCK	6	250	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
TL431AQPK	ACTIVE	SOT-89	PK	3	1000	TBD	CU SNPB	Level-1-220C-UNLIM
TL431BCD	ACTIVE	SOIC	D	8	75	Pb-Free (RoHS)	CU NIPDAU	Level-2-260C-1 YEAR/ Level-1-235C-UNLIM
TL431BCDBVR	ACTIVE	SOT-23	DBV	5	3000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
TL431BCDBVT	ACTIVE	SOT-23	DBV	5	250	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
TL431BCDBZR	ACTIVE	SOT-23	DBZ	3	3000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
TL431BCDBZRG4	ACTIVE	SOT-23	DBZ	3	3000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
TL431BCDBZT	ACTIVE	SOT-23	DBZ	3	250	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
TL431BCDBZTG4	ACTIVE	SOT-23	DBZ	3	250	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
TL431BCDCKR	ACTIVE	SC70	DCK	6	3000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
TL431BCDCKT	ACTIVE	SC70	DCK	6	250	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
TL431BCDR	ACTIVE	SOIC	D	8	2500	Pb-Free (RoHS)	CU NIPDAU	Level-2-260C-1 YEAR/ Level-1-235C-UNLIM

Orderable Device	Status ⁽¹⁾	Package Type	Package Drawing	Pins	Package Qty	Eco Plan ⁽²⁾	Lead/Ball Finish	MSL Peak Temp ⁽³⁾
TL431BCLP	ACTIVE	TO-92	LP	3	1000	TBD	CU SNPB	Level-NC-NC-NC
TL431BCLPM	ACTIVE	TO-92	LP	3	2000	TBD	CU SNPB	Level-NC-NC-NC
TL431BCLPR	ACTIVE	TO-92	LP	3	2000	TBD	CU SNPB	Level-NC-NC-NC
TL431BCP	ACTIVE	PDIP	P	8	50	Pb-Free (RoHS)	CU NIPDAU	Level-NC-NC-NC
TL431BCPK	ACTIVE	SOT-89	PK	3	1000	TBD	CU SNPB	Level-1-220C-UNLIM
TL431BCPSR	ACTIVE	SO	PS	8	2000	Pb-Free (RoHS)	CU NIPDAU	Level-2-260C-1 YEAR/ Level-1-235C-UNLIM
TL431BCPW	ACTIVE	TSSOP	PW	8	150	Pb-Free (RoHS)	CU NIPDAU	Level-1-250C-UNLIM
TL431BCPWE4	ACTIVE	TSSOP	PW	8	150	Pb-Free (RoHS)	CU NIPDAU	Level-1-250C-UNLIM
TL431BCPWR	ACTIVE	TSSOP	PW	8	2000	Pb-Free (RoHS)	CU NIPDAU	Level-1-250C-UNLIM
TL431BCPWRE4	ACTIVE	TSSOP	PW	8	2000	Pb-Free (RoHS)	CU NIPDAU	Level-1-250C-UNLIM
TL431BID	ACTIVE	SOIC	D	8	75	Pb-Free (RoHS)	CU NIPDAU	Level-2-260C-1 YEAR/ Level-1-235C-UNLIM
TL431BIDBVR	ACTIVE	SOT-23	DBV	5	3000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
TL431BIDBVT	ACTIVE	SOT-23	DBV	5	250	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
TL431BIDBZR	ACTIVE	SOT-23	DBZ	3	3000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
TL431BIDBZRG4	ACTIVE	SOT-23	DBZ	3	3000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
TL431BIDBZT	ACTIVE	SOT-23	DBZ	3	250	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
TL431BIDBZTG4	ACTIVE	SOT-23	DBZ	3	250	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
TL431BIDCKR	ACTIVE	SC70	DCK	6	3000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
TL431BIDCKT	ACTIVE	SC70	DCK	6	250	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
TL431BIDR	ACTIVE	SOIC	D	8	2500	Pb-Free (RoHS)	CU NIPDAU	Level-2-260C-1 YEAR/ Level-1-235C-UNLIM
TL431BILP	ACTIVE	TO-92	LP	3	1000	TBD	CU SNPB	Level-NC-NC-NC
TL431BILPR	ACTIVE	TO-92	LP	3	2000	TBD	CU SNPB	Level-NC-NC-NC
TL431BIP	ACTIVE	PDIP	P	8	50	Pb-Free (RoHS)	CU NIPDAU	Level-NC-NC-NC
TL431BIPK	ACTIVE	SOT-89	PK	3	1000	TBD	CU SNPB	Level-1-220C-UNLIM
TL431BQD	ACTIVE	SOIC	D	8	75	Pb-Free (RoHS)	CU NIPDAU	Level-2-260C-1 YEAR/ Level-1-235C-UNLIM
TL431BQDBVR	ACTIVE	SOT-23	DBV	5	3000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
TL431BQDBVT	ACTIVE	SOT-23	DBV	5	250	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
TL431BQDBZR	ACTIVE	SOT-23	DBZ	3	3000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
TL431BQDBZRG4	ACTIVE	SOT-23	DBZ	3	3000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM

Orderable Device	Status ⁽¹⁾	Package Type	Package Drawing	Pins	Package Qty	Eco Plan ⁽²⁾	Lead/Ball Finish	MSL Peak Temp ⁽³⁾
						no Sb/Br)		
TL431BQDBZT	ACTIVE	SOT-23	DBZ	3	250	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
TL431BQDBZTG4	ACTIVE	SOT-23	DBZ	3	250	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
TL431BQDCKR	ACTIVE	SC70	DCK	6	3000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
TL431BQDCKT	ACTIVE	SC70	DCK	6	250	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
TL431BQDR	ACTIVE	SOIC	D	8	2500	Pb-Free (RoHS)	CU NIPDAU	Level-2-260C-1 YEAR/ Level-1-235C-UNLIM
TL431BQLP	ACTIVE	TO-92	LP	3	1000	TBD	CU SNPB	Level-NC-NC-NC
TL431BQLPM	ACTIVE	TO-92	LP	3	2000	TBD	CU SNPB	Level-NC-NC-NC
TL431BQLPR	ACTIVE	TO-92	LP	3	2000	TBD	CU SNPB	Level-NC-NC-NC
TL431BQPK	ACTIVE	SOT-89	PK	3	1000	TBD	CU SNPB	Level-1-220C-UNLIM
TL431BQPSR	PREVIEW	SO	PS	8	2000	TBD	Call TI	Call TI
TL431CD	ACTIVE	SOIC	D	8	75	Pb-Free (RoHS)	CU NIPDAU	Level-2-260C-1 YEAR/ Level-1-235C-UNLIM
TL431CDBVR	ACTIVE	SOT-23	DBV	5	3000	Pb-Free (RoHS)	CU NIPDAU	Level-1-260C-UNLIM
TL431CDBVT	ACTIVE	SOT-23	DBV	5	250	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
TL431CDBZR	ACTIVE	SOT-23	DBZ	3	3000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
TL431CDBZRG4	ACTIVE	SOT-23	DBZ	3	3000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
TL431CDBZT	ACTIVE	SOT-23	DBZ	3	250	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
TL431CDBZTG4	ACTIVE	SOT-23	DBZ	3	250	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
TL431CDR	ACTIVE	SOIC	D	8	2500	Pb-Free (RoHS)	CU NIPDAU	Level-2-260C-1 YEAR/ Level-1-235C-UNLIM
TL431CKTPR	OBSOLETE	PFM	KTP	2		TBD	Call TI	Call TI
TL431CLP	ACTIVE	TO-92	LP	3	1000	TBD	CU SNPB	Level-NC-NC-NC
TL431CLPB-TDJ	OBSOLETE	TO-92	LP	3		TBD	Call TI	Call TI
TL431CLPM	ACTIVE	TO-92	LP	3	2000	TBD	CU SNPB	Level-NC-NC-NC
TL431CLPR	ACTIVE	TO-92	LP	3	2000	TBD	CU SNPB	Level-NC-NC-NC
TL431CP	ACTIVE	PDIP	P	8	50	Pb-Free (RoHS)	CU NIPDAU	Level-NC-NC-NC
TL431CPK	ACTIVE	SOT-89	PK	3	1000	TBD	CU SNPB	Level-1-220C-UNLIM
TL431CPSLE	OBSOLETE	SO	PS	8		TBD	Call TI	Call TI
TL431CPSR	ACTIVE	SO	PS	8	2000	Pb-Free (RoHS)	CU NIPDAU	Level-2-260C-1 YEAR/ Level-1-235C-UNLIM
TL431CPSRG4	ACTIVE	SO	PS	8	2000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
TL431CPW	ACTIVE	TSSOP	PW	8	150	Pb-Free (RoHS)	CU NIPDAU	Level-1-250C-UNLIM
TL431CPWE4	ACTIVE	TSSOP	PW	8	150	Pb-Free (RoHS)	CU NIPDAU	Level-1-250C-UNLIM

Orderable Device	Status ⁽¹⁾	Package Type	Package Drawing	Pins	Package Qty	Eco Plan ⁽²⁾	Lead/Ball Finish	MSL Peak Temp ⁽³⁾
TL431CPWLE	OBSOLETE	TSSOP	PW	8		TBD	Call TI	Call TI
TL431CPWR	ACTIVE	TSSOP	PW	8	2000	Pb-Free (RoHS)	CU NIPDAU	Level-1-250C-UNLIM
TL431CPWRE4	ACTIVE	TSSOP	PW	8	2000	Pb-Free (RoHS)	CU NIPDAU	Level-1-250C-UNLIM
TL431ID	ACTIVE	SOIC	D	8	75	Pb-Free (RoHS)	CU NIPDAU	Level-2-260C-1 YEAR/ Level-1-235C-UNLIM
TL431IDBVR	ACTIVE	SOT-23	DBV	5	3000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
TL431IDBVT	ACTIVE	SOT-23	DBV	5	250	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
TL431IDBZR	ACTIVE	SOT-23	DBZ	3	3000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
TL431IDBZRG4	ACTIVE	SOT-23	DBZ	3	3000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
TL431IDBZT	ACTIVE	SOT-23	DBZ	3	250	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
TL431IDBZTG4	ACTIVE	SOT-23	DBZ	3	250	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
TL431IDR	ACTIVE	SOIC	D	8	2500	Pb-Free (RoHS)	CU NIPDAU	Level-2-260C-1 YEAR/ Level-1-235C-UNLIM
TL431ILP	ACTIVE	TO-92	LP	3	1000	TBD	CU SNPB	Level-NC-NC-NC
TL431ILPM	OBSOLETE	TO-92	LP	3		TBD	Call TI	Call TI
TL431ILPR	ACTIVE	TO-92	LP	3	2000	TBD	CU SNPB	Level-NC-NC-NC
TL431IP	ACTIVE	PDIP	P	8	50	Pb-Free (RoHS)	CU NIPDAU	Level-NC-NC-NC
TL431IPK	ACTIVE	SOT-89	PK	3	1000	TBD	CU SNPB	Level-1-220C-UNLIM
TL431MFKB	OBSOLETE	LCCC	FK	20		TBD	Call TI	Call TI
TL431MJG	OBSOLETE	CDIP	JG	8		TBD	Call TI	Call TI
TL431MJGB	OBSOLETE	CDIP	JG	8		TBD	Call TI	Call TI
TL431QDBVR	ACTIVE	SOT-23	DBV	5	3000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
TL431QDBVT	ACTIVE	SOT-23	DBV	5	250	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
TL431QDBZR	ACTIVE	SOT-23	DBZ	3	3000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
TL431QDBZRG4	ACTIVE	SOT-23	DBZ	3	3000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
TL431QDBZT	ACTIVE	SOT-23	DBZ	3	250	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
TL431QDBZTG4	ACTIVE	SOT-23	DBZ	3	250	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
TL431QDCKR	ACTIVE	SC70	DCK	6	3000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
TL431QDCKT	ACTIVE	SC70	DCK	6	250	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
TL431QPK	ACTIVE	SOT-89	PK	3	1000	TBD	CU SNPB	Level-1-220C-UNLIM
TL432ACDBVR	ACTIVE	SOT-23	DBV	5	3000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
TL432ACDBZR	ACTIVE	SOT-23	DBZ	3	3000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM

Orderable Device	Status ⁽¹⁾	Package Type	Package Drawing	Pins	Package Qty	Eco Plan ⁽²⁾	Lead/Ball Finish	MSL Peak Temp ⁽³⁾
						no Sb/Br)		
TL432ACDBZRG4	ACTIVE	SOT-23	DBZ	3	3000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
TL432ACDBZT	ACTIVE	SOT-23	DBZ	3	250	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
TL432ACDBZTG4	ACTIVE	SOT-23	DBZ	3	250	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
TL432AIDBVR	ACTIVE	SOT-23	DBV	5	3000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
TL432AIDBZR	ACTIVE	SOT-23	DBZ	3	3000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
TL432AIDBZRG4	ACTIVE	SOT-23	DBZ	3	3000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
TL432AIDBZT	ACTIVE	SOT-23	DBZ	3	250	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
TL432AIDBZTG4	ACTIVE	SOT-23	DBZ	3	250	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
TL432AQDBVR	ACTIVE	SOT-23	DBV	5	3000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
TL432AQDBVT	ACTIVE	SOT-23	DBV	5	250	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
TL432AQDBZR	ACTIVE	SOT-23	DBZ	3	3000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
TL432AQDBZRG4	ACTIVE	SOT-23	DBZ	3	3000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
TL432AQDBZT	ACTIVE	SOT-23	DBZ	3	250	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
TL432AQDBZTG4	ACTIVE	SOT-23	DBZ	3	250	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
TL432BCDBVR	ACTIVE	SOT-23	DBV	5	3000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
TL432BCDBZR	ACTIVE	SOT-23	DBZ	3	3000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
TL432BCDBZRG4	ACTIVE	SOT-23	DBZ	3	3000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
TL432BCDBZT	ACTIVE	SOT-23	DBZ	3	250	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
TL432BCDBZTG4	ACTIVE	SOT-23	DBZ	3	250	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
TL432BIDBVR	ACTIVE	SOT-23	DBV	5	3000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
TL432BIDBZR	ACTIVE	SOT-23	DBZ	3	3000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
TL432BIDBZRG4	ACTIVE	SOT-23	DBZ	3	3000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
TL432BIDBZT	ACTIVE	SOT-23	DBZ	3	250	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
TL432BIDBZTG4	ACTIVE	SOT-23	DBZ	3	250	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
TL432BQDBVR	ACTIVE	SOT-23	DBV	5	3000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM

Orderable Device	Status ⁽¹⁾	Package Type	Package Drawing	Pins	Package Qty	Eco Plan ⁽²⁾	Lead/Ball Finish	MSL Peak Temp ⁽³⁾
TL432BQDBVT	ACTIVE	SOT-23	DBV	5	250	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
TL432BQDBZR	ACTIVE	SOT-23	DBZ	3	3000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
TL432BQDBZRG4	ACTIVE	SOT-23	DBZ	3	3000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
TL432BQDBZT	PREVIEW	SOT-23	DBZ	3	250	TBD	Call TI	Call TI
TL432CDBVR	ACTIVE	SOT-23	DBV	5	3000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
TL432CDBZR	ACTIVE	SOT-23	DBZ	3	3000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
TL432CDBZRG4	ACTIVE	SOT-23	DBZ	3	3000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
TL432CDBZT	ACTIVE	SOT-23	DBZ	3	250	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
TL432CDBZTG4	ACTIVE	SOT-23	DBZ	3	250	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
TL432IDBVR	ACTIVE	SOT-23	DBV	5	3000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
TL432IDBZR	ACTIVE	SOT-23	DBZ	3	3000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
TL432IDBZRG4	ACTIVE	SOT-23	DBZ	3	3000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
TL432IDBZT	ACTIVE	SOT-23	DBZ	3	250	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
TL432IDBZTG4	ACTIVE	SOT-23	DBZ	3	250	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
TL432QDBVR	ACTIVE	SOT-23	DBV	5	3000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
TL432QDBVT	ACTIVE	SOT-23	DBV	5	250	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
TL432QDBZR	ACTIVE	SOT-23	DBZ	3	3000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
TL432QDBZRG4	ACTIVE	SOT-23	DBZ	3	3000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
TL432QDBZT	ACTIVE	SOT-23	DBZ	3	250	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
TL432QDBZTG4	ACTIVE	SOT-23	DBZ	3	250	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM

⁽¹⁾ The marketing status values are defined as follows:

ACTIVE: Product device recommended for new designs.

LIFEBUY: TI has announced that the device will be discontinued, and a lifetime-buy period is in effect.

NRND: Not recommended for new designs. Device is in production to support existing customers, but TI does not recommend using this part in a new design.

PREVIEW: Device has been announced but is not in production. Samples may or may not be available.

OBSELETE: TI has discontinued the production of the device.

⁽²⁾ Eco Plan - The planned eco-friendly classification: Pb-Free (RoHS) or Green (RoHS & no Sb/Br) - please check <http://www.ti.com/productcontent> for the latest availability information and additional product content details.

TBD: The Pb-Free/Green conversion plan has not been defined.

Pb-Free (RoHS): TI's terms "Lead-Free" or "Pb-Free" mean semiconductor products that are compatible with the current RoHS requirements for all 6 substances, including the requirement that lead not exceed 0.1% by weight in homogeneous materials. Where designed to be soldered at high temperatures, TI Pb-Free products are suitable for use in specified lead-free processes.

Green (RoHS & no Sb/Br): TI defines "Green" to mean Pb-Free (RoHS compatible), and free of Bromine (Br) and Antimony (Sb) based flame retardants (Br or Sb do not exceed 0.1% by weight in homogeneous material)

⁽³⁾ MSL, Peak Temp. -- The Moisture Sensitivity Level rating according to the JEDEC industry standard classifications, and peak solder temperature.

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