

MINIATURE, 1-W, 3-kV ISOLATED UNREGULATED DC/DC CONVERTERS

FEATURES

- Up To 78% Efficiency
- 3-kVDC Isolation
- UL60950 Certified Product
- Industry Standard Footprint
- JEDEC SIP-7 Package

APPLICATIONS

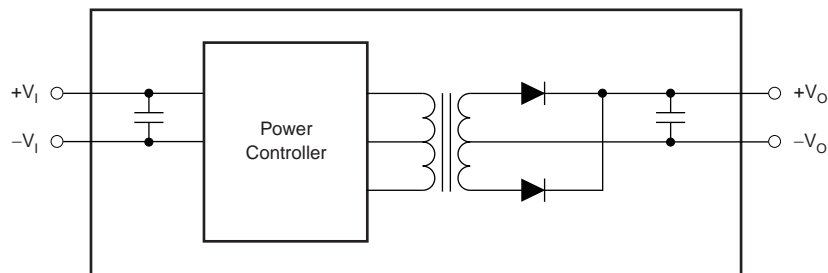
- Point-of-Use Power Conversion
- Ground Loop Elimination
- Data Acquisition
- Industrial Control and Instrumentation
- Test Equipment™

DESCRIPTION

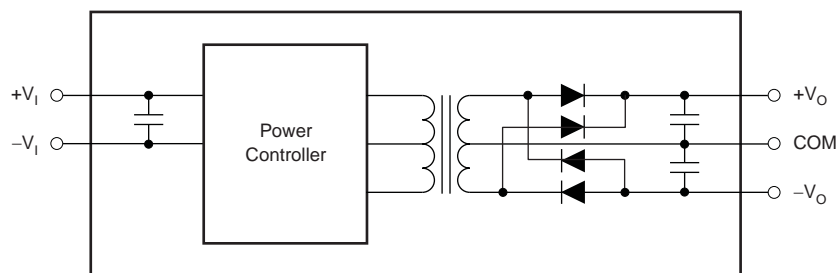
The DCH01 series is a family of miniature, 1-W, 3-kV isolated DC/DC converters. Featured in an industry standard SIP-7 footprint, the DCH01 series requires minimal external components, reducing board space. The DCH01 series provides both single and dual split-supply outputs.

The use of a highly integrated package design results in highly reliable products with high power densities. High performance and small size makes the DCH01 suitable for a wide range of applications including signal chain applications and ground loop elimination.

Single Output Block Diagram



Dual Output Block Diagram



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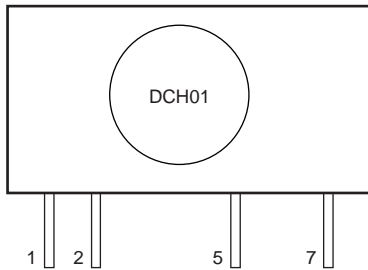


ELECTRICAL CHARACTERISTICS

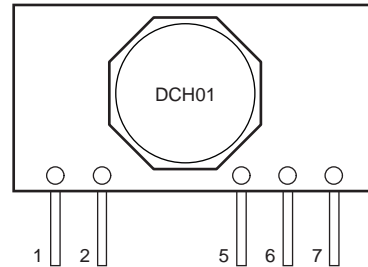


DEVICE INFORMATION

**EDJ PACKAGE
SIP-7 (Single)
(Top View)**



**EDJ PACKAGE
SIP-7 (Dual)
(Top View)**



Pin Description (Single)

TERMINAL		DESCRIPTION
NAME	NO.	
+V _I	1	Voltage input
-V _I	2	Input side common
-V _O	5	-Voltage out
+V _O	7	+Voltage out

Pin Descriptions (Dual)

TERMINAL		DESCRIPTION
NAME	NO.	
+V _I	1	Voltage input
-V _I	2	Input side common
-V _O	5	-Voltage out
COM	6	Output side common
+V _O	7	+Voltage out

TYPICAL CHARACTERISTICS

At $T_A = +25^\circ\text{C}$, and $V_{IN} = 5\text{V}$ unless otherwise noted.

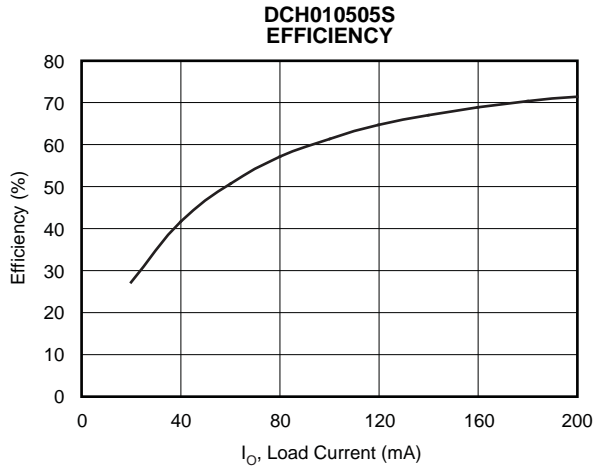


Figure 1.

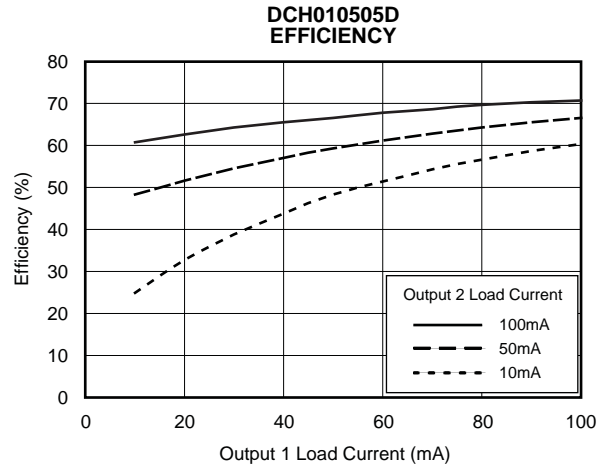


Figure 2.

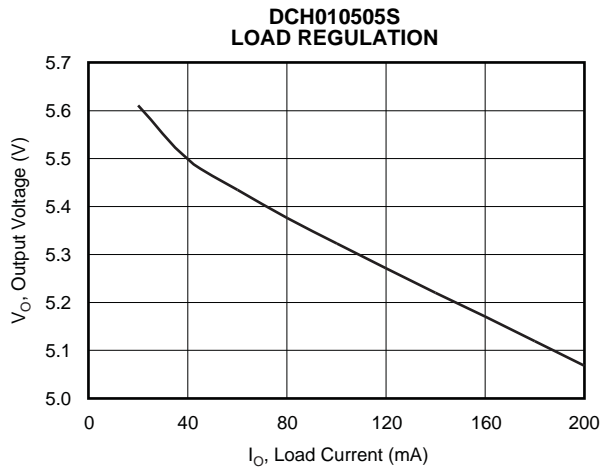


Figure 3.

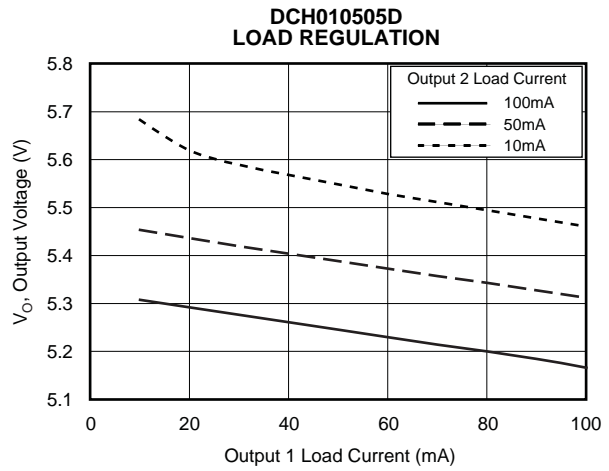


Figure 4.

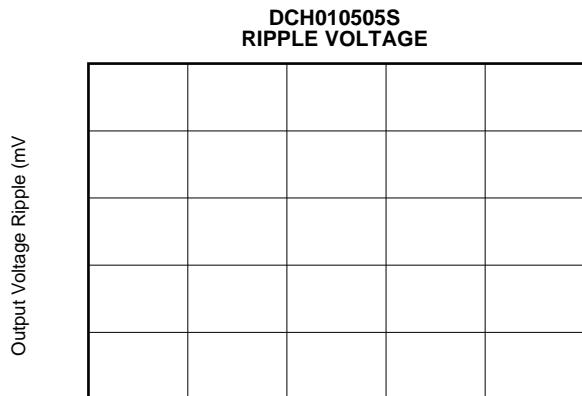


Figure 5.

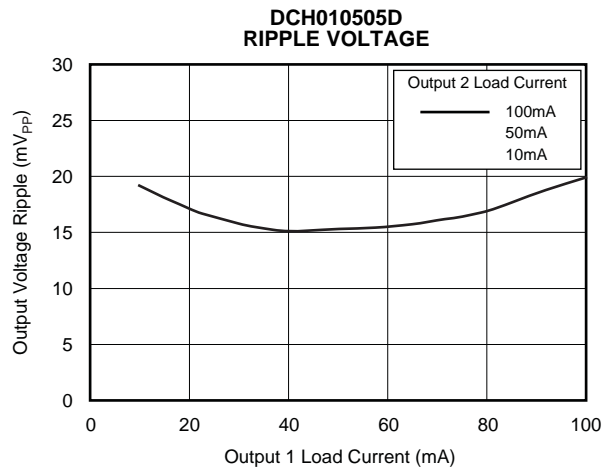
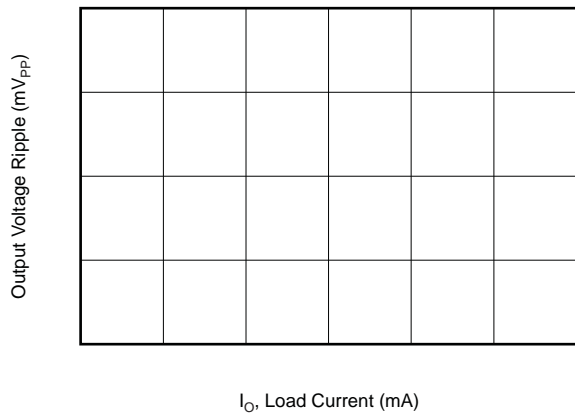
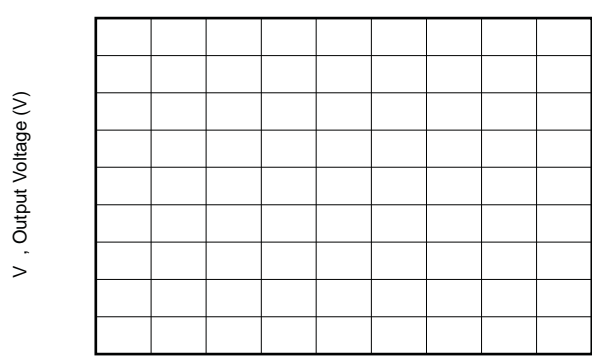
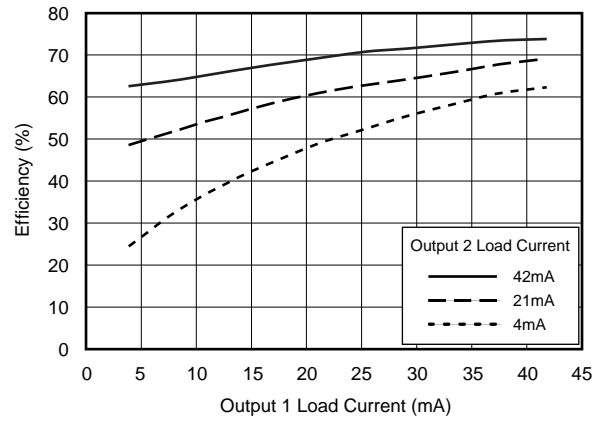
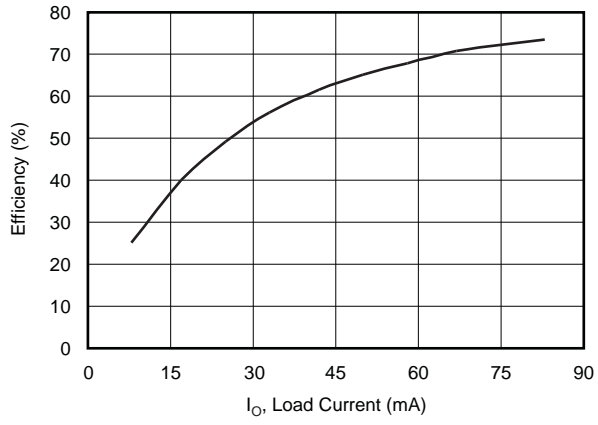


Figure 6.



TYPICAL CHARACTERISTICS (continued)

At $T_A = +25^\circ\text{C}$, and $V_{IN} = 5\text{V}$ unless otherwise noted.

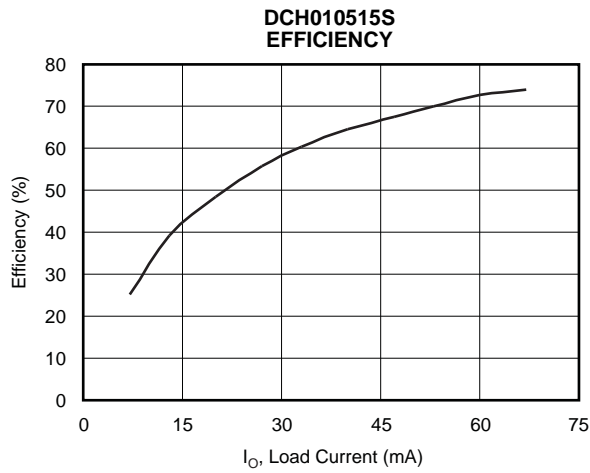


Figure 13.

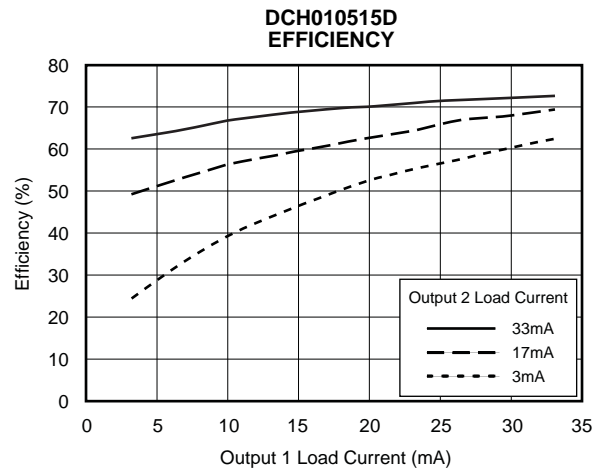


Figure 14.

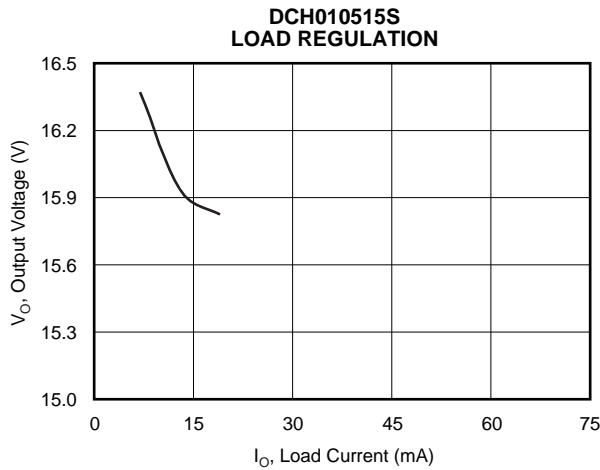


Figure 15.

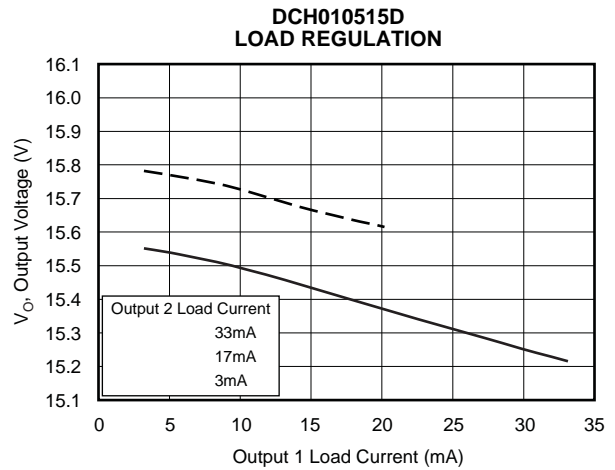


Figure 16.

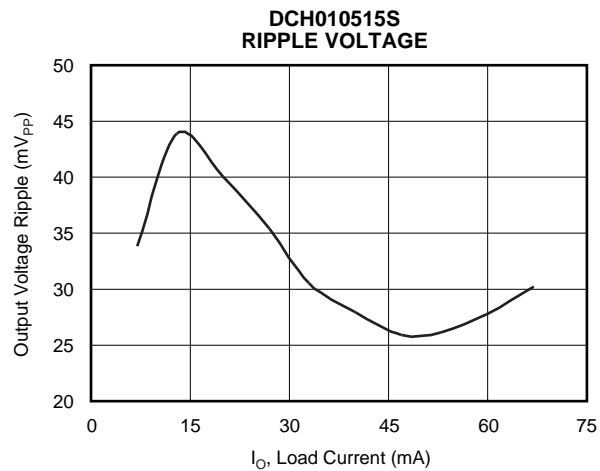


Figure 17.

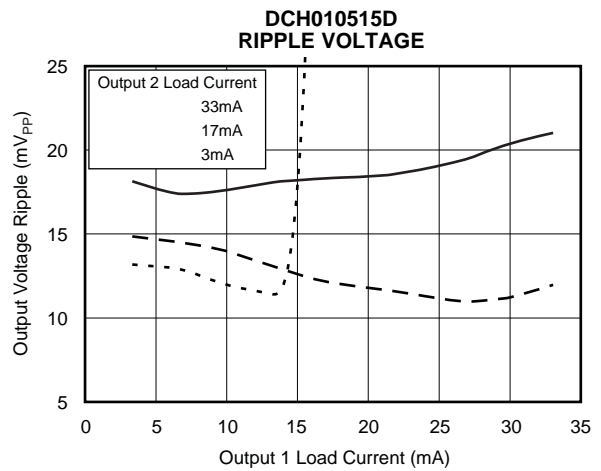


Figure 18.

TYPICAL CHARACTERISTICS (continued)

At $T_A = +25^\circ\text{C}$, and $V_{IN} = 5\text{V}$ unless otherwise noted.

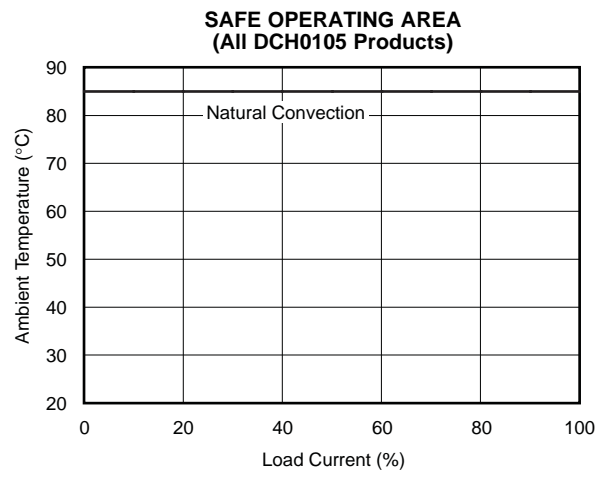


Figure 19.

FUNCTIONAL DESCRIPTION

ISOLATION VOLTAGE

Repeated High-Voltage Isolation Testing

APPLICATION INFORMATION

OPTIONAL INPUT/OUTPUT FILTERS

(FILTERS)Tj 1 0 0 1 54 3 ERSFILTERIE11

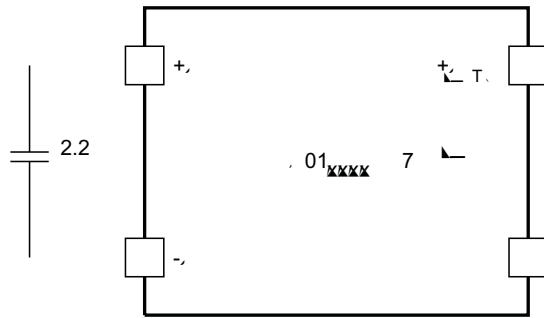


Figure 21. DCH01 Series π Filter (5 V at 1 W)

π FILTERS

If a further reduction in ripple/noise level is required for an application, higher order filters must be used. A π (π) filter, employing a ferrite bead inductor in series with the input or output terminals of the regulator reduces the ripple/noise by at least 20 db (see Figure 20 and Figure 21). Ceramic capacitors are required for the inductor to be effective in reduction of ripple and noise.

These inductors plus ceramic capacitors form an excellent filter because of the rejection at the switching frequency. The placement of this filter is critical. It must be located as close as possible to the input or output pins to be effective. The ferrite bead is small (12,5 mm x 3 mm), easy to use, low cost, and has low dc resistance. Fair-Rite manufactures a surface-mount bead (part number 2773021447) or through hole (part number 2673000701) rated to 5 A. Inductors with a value between 1 μ H and 5 μ H can be used in place of the ferrite bead inductor.

DCH01 START-UP

Start-up waveforms.

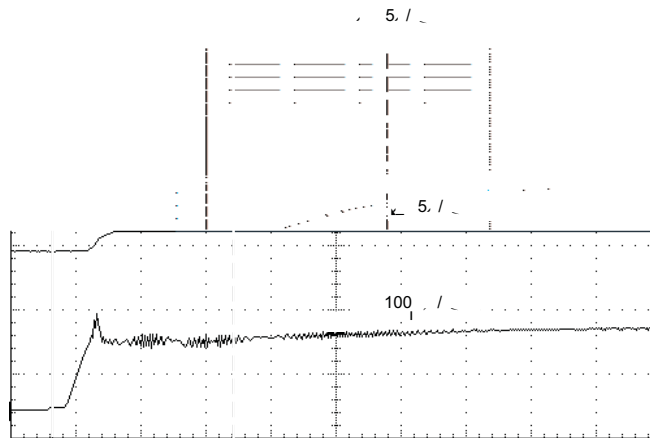


Figure 22. Startup Waveforms

CONNECTING THE DCH01 IN SERIES

It is possible to connect the outputs of multiple DCH01s in series to provide non-standard voltage rails. The outputs of dual output DCH01 versions can also be connected in series to provide $2 \times$ the magnitude of V_O , as shown in [Figure 23](#). For example, a dual 5-V DCH01 could be connected to provide a 10-V rail.

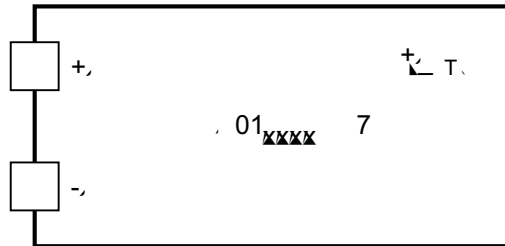


Figure 23. Connecting Dual Outputs in Series

CONNECTING THE DCH01 IN PARALLEL

If the output power from one DCH01 is not sufficient, it is possible to parallel the outputs of multiple DCH01s, as shown in [Figure 24](#).

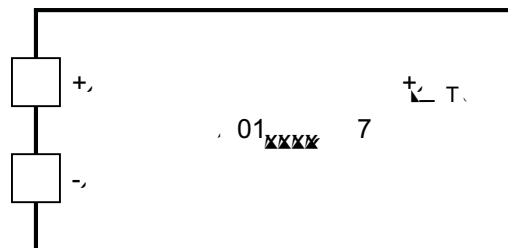


Figure 24. Connecting Multiple DCH01s in Parallel

PACKAGING INFORMATION

Orderable Device	Status ⁽¹⁾	Package Type	Package Drawing	Pins	Package Qty	Eco Plan ⁽²⁾	Lead/Ball Finish	MSL Peak Temp ⁽³⁾
DCH010505DN7	ACTIVE	SIP MOD ULE	EDJ	5	70	Pb-Free (RoHS)	Call TI	N / A for Pkg Type
DCH010505SN7	ACTIVE	SIP MOD ULE	EDJ	4	70	Pb-Free (RoHS)	Call TI	N / A for Pkg Type
DCH010512DN7	ACTIVE	SIP MOD ULE	EDJ	5	70	Pb-Free (RoHS)	Call TI	N / A for Pkg Type
DCH010512SN7	ACTIVE	SIP MOD ULE	EDJ	4	70	Pb-Free (RoHS)	Call TI	N / A for Pkg Type
DCH010515DN7	ACTIVE	SIP MOD ULE	EDJ	5	70	Pb-Free (RoHS)	Call TI	N / A for Pkg Type
DCH010515SN7	ACTIVE	SIP MOD ULE	EDJ	4	70	Pb-Free (RoHS)	Call TI	N / A for Pkg Type

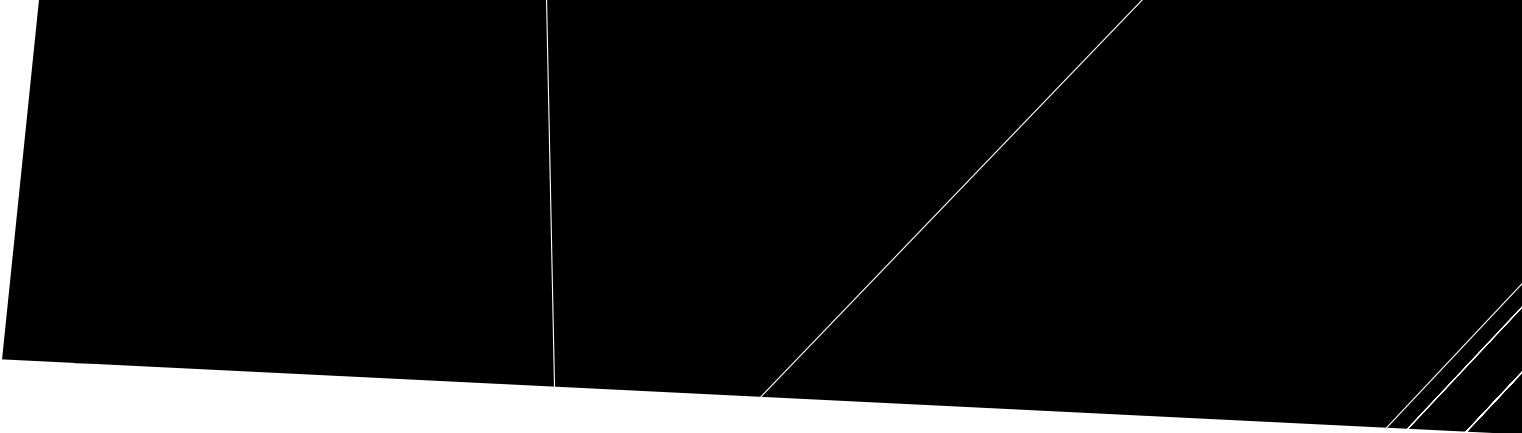
⁽¹⁾ The marketing status values are defined as follows:

ACTIVE: Product device recommended for new designs.

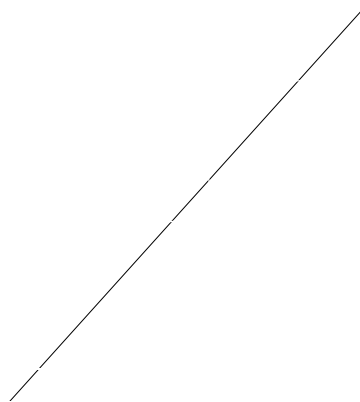
LIFEBUY: TI has announced that the device will be discontinued, and a lifetime-buy period is in effect.

NRND: Not recommended for new designs. is dm [(ACTie] TJ /F3 8.05v24.493 Tm [(ULE)] TJ ET q 02.362J ET q 02n362J ET q 0p-278.0ion362J ET q 0to





▶ ◀



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