

## External Lead Finish for Hermetic Packages

For hermetic packages, National Semiconductor offers three primary lead finishes: solder dip, gold plate and tin plate. The component lead finish serves as a protective coating to prevent oxidation of the lead base material prior to use. The lead finish will ensure the leads are solderable for board mount applications as well as provide long term protection against lead corrosion. The lead finish composition and thickness is dependent on the package type and the applications in which the package is used. Lead finish for Mil/Aero product and all commercial product except Cerquad and selected metal cans conforms to the requirements of Mil-M-38510.

### SOLDER DIP

The solder dip lead finish for hermetic packages is a 60%–63% tin, 40%–37% lead alloy. The finish is applied by dipping the package leads or terminals into the molten solder. Solder dipped leads provide excellent solderability. Solder dip lead finish is typically lower in cost as compared to gold or tin plating. The solder thickness and composition conforms to the requirements of Mil-M-38510.

### GOLD PLATE

Gold plated leads are used for many multilayer ceramic packages and metal can packages. For multilayer ceramic packages, pure gold is electroplated over an electrolytic nickel underplate. The gold plating for metal can packages is also pure electrolytically plated, but it may be applied over an electroless or an electrolytic nickel plate.

Gold plate is used on package types that cannot be solder dipped or as process simplification. Multilayer ceramic packages such as ceramic quad flatpacks (CQFP) and ceramic pin grid arrays (CPGA) are gold plated. Many metal cans are offered with gold plated leads.

### TIN PLATE

A lead finish of 100% tin plate is used on fine pitch Cerquad packages used in commercial applications. A plating thickness of 200 microinches minimum is supplied.

The following table is provided as a reference to determine which lead finish is used for each hermetic package type offered at National Semiconductor.

### Lead Finish for Hermetic Packages

Package Type (Code)	Package Designator	Specific Package	External Lead Finish Mil-Aero	External Lead Finish Commercial
Ceramic Dual-In-Line Package — Sidebraced (SB)	D; DA		Gold Plate or Solder Dip	Gold Plate or Solder Dip
Leadless Chip Carrier (LCC)	E; EA		Solder Dip	Gold Plate or Solder Dip
Ceramic Quad J-Bend (CQJB)	EL		Gold Plate	Gold Plate
Ceramic Quad Flatpack (CQFP)	EL		Gold Plate	Gold Plate
Ceramic Flatpack	F		Gold Plate	Gold Plate
Ceramic Dual-In-Line Package (Cerdip)	J; JA		Solder Dip	Solder Dip
Small Outline Integrated Circuit, Wide	MC		Gold Plate	Gold Plate
Ceramic Pin Grid Array (CPGA)	U; UA		Gold Plate	Gold Plate
Cerpack	W; WA		Solder Dip	Solder Dip
Cerquad	W; WA		Solder Dip	Solder Dip or Tin Plate
Metal Can Package (TO)	H; HA	TO-5/18/39	Gold Plate or Solder Dip	Gold Plate or Solder Dip
	H; HA	TO-46/52/72	Gold Plate or Solder Dip	Gold Plate or Solder Dip
	K; KA	TO-3	Solder Dip	Solder Dip
Metal Ledged Chip Carrier	AA			Solder Plate (85/15)
MQuad	ACC			Solder Plate (85/15)
	ACE			
	ALE			
	AUL			
	AUA			
	AUW			
	AUY			
AUZ				

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