

Toshiba Semiconductor Lead-Free Status for Discrete Products

Feb., 2005

Products Category	Products type	Package type ^{*1}	Plating/Dipping Materials	Schedule ^{*2}		
Discrete Device	CMOS Logic devices	DIP14/16	Sn-Ag(plating)	Under mass production		
		DIP20/24	Sn-Ag(plating)	Under mass production		
		SOP14	Ni/Pd/Au(plating)	Under mass production		
		SOP16/20	Ni/Pd/Au(plating)	Under mass production		
		SSOP24	Ni/Pd/Au(plating)	Under mass production		
		TSSOP48,56	Ni/Pd/Au(plating)	Under mass production		
		TSSOP14,16,20	Ni/Pd/Au(plating)	Under mass production		
		US16,20	Ni/Pd/Au(plating)	Under mass production		
		Smallsignal devices Transistor/Diode	TESC/TESM/TESM2/TESM3	Sn-Ag(plating)	Under mass production	
			TESQ	Sn-Ag(plating)	Under mass production	
	ESC/ESV		Sn-Ag(plating)	Under mass production		
	ESM/ES6		Sn-Ag(plating)	Under mass production		
	SSC		Sn-Ag(plating)	Under mass production		
	SSM		Sn-Ag(plating)	Under mass production		
	USC		Sn-Ag(plating)	Under mass production		
	USQ/US6/TU6/US8		Sn-Ag(plating)	Under mass production		
	USV		Sn-Ag(plating)	Under mass production		
	FM8		Sn-Ag-Cu(dipping)	Under mass production		
	USM		Sn-Ag(plating)	Under mass production		
	SM/SMQ/SMV/SM6		Sn-Ag-Cu(dipping) or Sn-Ag(plating)	Under mass production		
	TSM		Sn-Ag(plating)	Under mass production		
	SM8		Sn-Ag(plating)	Under mass production		
	SSOP18/HSOP20		Sn-Ag(plating)	Under mass production		
	SS-CSP		Au(plating)	Under mass production		
	sESC/sES6		Sn-Ag(plating)	Under mass production		
	fSC/fSM/fS6		Sn-Ag(plating)	Under mass production		
	UFV/UF6		Sn-Ag(plating)	Under mass production		
	TO-92(and other straight-terminal type)		Sn-Ag-Cu(dipping)	Under mass production		
	Power devices Transistor/Diode/ Intelligent power module		Pw-Mini	Sn-Ag-Cu(dipping)	Under mass production	
			UFV,SMV	Sn-Ag(plating)	Under mass production	
			PW-MOLD(straight terminal type)/NewPW-MOLD	Sn-Ag(plating)	Under mass production	
			TSSOP-8/SOP-8	Sn-Ag(plating)	Under mass production	
			TSM	Sn-Ag(plating)	Under mass production	
			SSOP-10,20,24	Sn-Ag(plating)	Under mass production	
			VS-6/VS-8	Sn-Ag(plating)	Under mass production	
			PS-8	Sn-Ag(plating)	Under mass production	
			DP	Sn-Ag(plating)	Under mass production	
			SOP-Advance	Sn-Ag(plating)	Under mass production	
		TO-220SM	Sn-Ag(plating)	Under mass production		
		TO-220FL	Sn-Ag-Cu(dipping)	Under mass production		
		TO-220NIS	Sn-Ag-Cu(dipping)	Under mass production		
		TO-220AB	Sn-Ag-Cu(dipping)	Under mass production		
		TO-220SIS	Sn-Ag-Cu(dipping)	Under mass production		
		TO-3P(N),(N)IS,(H)IS,(L),(LH)	Sn-Ag-Cu(dipping)	Under mass production		
		TFP	Sn-Ag(plating)	Under mass production		
		F-12,18,23/S-10,12	Sn-Ag-Cu(dipping)	Under mass production		
		I-FLAT/S-FLAT/M-FLAT/US-FLAT/MR	Sn-Ag(plating)	Under mass production		
		TO-126IS	Sn-Ag-Cu(dipping)	Under mass production		
		TPS/TPL	Sn-Ag-Cu(dipping)	Under mass production		
		MSTM	Sn-Ag-Cu(dipping)	Under mass production		
		TO-92/TO-92MOD	Sn-Ag-Cu(dipping)	Under mass production		
		DO-15/41 Series	Sn-Ag-Cu(dipping)	Under mass production		
		Press Package IGBT/IEGT	Sn-Ag (Connection of coaxial cable)	Under mass production		
		Opto devices LED/Sensor/Toslink Photocoupler/Laser	LED	Small SMD Lamps(Board type:TLxx1002A/1008A series) (TLxx1005B series are excepted)	Au(plating)	Under mass production
				Small Size SMD Lamps(SSH:TLxx1020 series)	Sn-Ag(plating)	Under mass production
				Large Size SMD Lamp(Only some products are applied) Lead type(Φ3/Φ5,etc)(General purpose lamps are excepted)	Ni/Pd/Au(plating) Sn-Ag-Cu(dipping)	Under mass production Under mass production
			Sensor	Ultra small Photointerrupters	Sn-Ag(plating)	Under mass production
				Photointerrupter with a connector	Sn(plating)	Under mass production
	Photorefractive Sensor(TLP910 are excepted)/ Small Side View			Sn-Ag(plating)	Under mass production	
	Lead type(Φ3/Φ5 Mold type)			Sn-Ag-Cu(dipping)	Under mass production	
	Illuminance sensor(SMD)			Au(plating)/ Sn-Ag(plating)	Under mass production	
	TO-18(CAN)			Au(plating)	Under mass production	
	SOP(Camera, Only some products are applied)/ Double End			Ag(plating)	Under mass production	
	Side View			Sn-Ag-Cu(dipping)	Under mass production	
	Toslink			Module for Audio	Sn-Ag(plating)	Under mass production
				Mold resin package type(Audio type are excepted)	Sn-Ag(plating)	Under mass production
			Ceramics package type	Au(plating)	Under mass production	
	Photocoupler		DIP(Reflective Structure)	4pin	Ni/Pd/Au(plating)	Under mass production
			DIP(Face to Face Structure)	4pin/6pin/8pin	Sn(plating) or Ni/Pd/Au(plating)	Under mass production
				16pin/ AC PowerCoupler		Under mass production
			DIP (Face to Face, Double Mold)	4pin/6pin	Sn(plating)	Under mass production
			MFSOP(Reflective Structure)	4pin	Sn-Ag-Cu(dipping)	Under mass production
			MFSOP(Face to Face Structure)	4pin/5pin	SnAg(plating) or Ni/Pd/Au(plating)	Under mass production
			MFSOP (Face to Face, Double Mold)	4pin/5pin	Sn-Ag-Cu(dipping) or Sn-Ag(plating)	Under mass production
			SOP(Reflective Structure)	4pin 16pin	Sn-Ag-Cu(dipping) Ni/Pd/Au(plating)	Under mass production Under mass production
			2.54SOP(Face to Face Structure)	4pin/6pin/ 8pin(Photo Relay)	Ni/Pd/Au(plating)	Under mass production
			Laser	φ5.6(CAN)		Au(plating)
	Frame type				Au(plating)	Under mass production

*1 : Some optical devices are categorized by product. And Photo-Triac Couplers and AC Power Couplers are planned to be converted consecutively. Thus, please contact us for details.

*2 : Pb free is implemented ahead of the schedule for some products . Please ask the local sales department for the detail.

*3 : "Lead(Pb)- Free" means entire product is Pb Free, "Lead(Pb)-Free Finish" means Pb Free for only terminals.

(But, both are mixed in TO-220 series, TO-3P series, TO-92 series. So please ask our sales department for the detail.)

*4 : To newly implement Pb free finish for the products (except for the products of lead free finish that are under mass-production),

we will add either of the below characters (F or Q) to the end in the parentheses (Add-code) next to the product type.

For the devices of which entire product is Pb Free: F, For the devices of which terminals only are Pb free: Q

Toshiba Semiconductor Lead-Free Status for System LSI Products

Feb., 2005

Products Category	Products Type	Package Type	Plating/Terminal Ball Materials	Schedule
System LSI Device	Video/Infomotion	DIP/SDIP	Sn-Ag	Under Mass Production
			Sn-Bi	Under Mass Production
		SOP/SSOP	Sn-Ag	Under Mass Production
			Sn-Bi	Under Mass Production
			Pd(Ni/Pd/Au)	Under Mass Production
		QFP	Sn-Ag	Under Mass Production
			Sn-Bi	Under Mass Production
			Pd(Ni/Pd/Au)	Under Mass Production
		TQFP/HQFP	Sn-Ag	Under Mass Production
		LQFP	Sn-Ag	Under Mass Production
			Sn-Bi	Under Mass Production
			Pd(Ni/Pd/Au)	Under Mass Production
		QON	Sn-Ag	Under Mass Production
		PBGA/FBGA/TBGA	Sn-Ag-Cu Ball	Under Mass Production
	FCBGA	Sn-Ag-Cu Ball	Under Mass Production	
	Comunication	DIP/SDIP	Sn-Ag	Under Mass Production
			Sn-Bi	Under Mass Production
		SOP/SSOP	Sn-Ag	Under Mass Production
			Pd(Ni/Pd/Au)	Under Mass Production
		QFP	Sn-Ag	Under Mass Production
			Sn-Bi	Under Mass Production
			Pd(Ni/Pd/Au)	Under Mass Production
		LQFP	Sn-Ag	Under Mass Production
	Sn-Bi		Under Mass Production	
	Pd(Ni/Pd/Au)		Under Mass Production	
	PBGA/FBGA/TBGA	Sn-Ag-Cu Ball	Under Mass Production	
	FCBGA	Sn-Ag-Cu Ball	Under Mass Production	
	Automotove/ Microprocessor	DIP/SDIP	Sn-Ag	Under Mass Production
			Sn-Bi	Under Mass Production
		SOP/SSOP/TSSOP	Sn-Ag	Under Mass Production
			Sn-Bi	Under Mass Production
			Pd(Ni/Pd/Au)	Under Mass Production
		QFP	Sn-Ag	Under Mass Production
			Sn-Bi	Under Mass Production
			Pd(Ni/Pd/Au)	Under Mass Production
		LQFP	Sn-Ag	Under Mass Production
			Sn-Bi	Under Mass Production
	Pd(Ni/Pd/Au)		Under Mass Production	
	PBGA/FBGA/TBGA	Sn-Ag-Cu Ball	Under Mass Production	
	EBGA	Sn-Ag-Cu Ball	Under Mass Production	
	Analog Peripheral	DIP/SDIP/SIP/SSIP/ZIP	Sn-Ag	Under Mass Production
			Sn	Under Mass Production
SOP/SSOP		Sn-Ag	Under Mass Production	
SSOP(0.65)		Sn-Ag	Under Mass Production	
HSOP/HQFP/THQFP		Sn-Ag	Under Mass Production	
QFP		Sn-Ag	Under Mass Production	
LQFP		Sn-Ag	Under Mass Production	
QON		Sn-Ag	Under Mass Production	

Toshiba Semiconductor Lead-Free Status for Memory Products

Feb., 2005

Products Category	Product Type	Package Type	Plating/Terminal Ball Materials	Schedule	
Memory Device	DRAMs	P-BGA60-0917-1.00AZ	Sn-Ag-Cu	Under Mass Production	
		P-TFBGA-144-1119-0.80BZ	Sn-Ag-Cu	Under Mass Production	
		P-BGA64-1317-1.00AZ	Sn-Ag-Cu	Under Mass Production	
	SRAMs	SOP32-P-525-1.27	Sn-Ag	Under Mass Production	
		TSOP I 32-P-0.50	Sn-Ag	Under Mass Production	
		TSOP I 40-P-1014-0.50	Sn-Ag	Under Mass Production	
		TSOP I 48-P-1214-0.50	Sn-Ag	Under Mass Production	
		TSOP I 48-P-1220-0.50	Sn-Ag	Under Mass Production	
		TSOP II 32-P-400-1.27	Sn-Ag	Under Mass Production	
		TSOP II 44-P-400-0.80	Sn-Ag	Under Mass Production	
		TSOP II 54-P-400-0.80	Sn-Ag	Under Mass Production	
		P-TFBGA48-0608-0.75AZ	Sn-Ag-Cu	Under Mass Production	
		P-TFBGA48-0608-0.75BZ	Sn-Ag-Cu	Under Mass Production	
		P-TFBGA48-0811-0.75BZ	Sn-Ag-Cu	Under Mass Production	
		NOR Flash	TSOP I 48-P-1220-0.50	Sn-Ag	Under Mass Production
			P-TFBGA56-0710-0.80AZ	Sn-Ag-Cu	Under Mass Production
		NAND Flash	TSOP I 48-P-1220-0.50	Sn-Ag	Under Mass Production
	Sn-Cu			Under Mass Production	