TOSHIBA Photocoupler GaAs IRed & Photo−Transistor

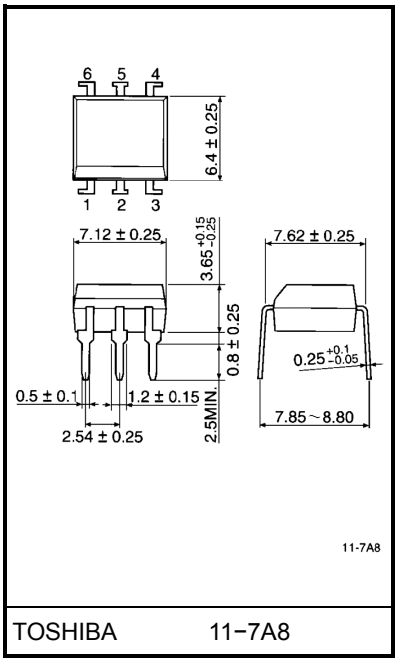
4N35(Short), 4N36(Short), 4N37(Short)

AC Line / Digital Logic Isolator.
Digital Logic / Digital Logic Isolator.
Telephone Line Receiver.
High Frequency Power Supply Feedback Control.
Relay Contact Monitor.

The TOSHIBA 4N35 (short) through 4N37 (short) consists of a gallium arsenide infrared emitting diode coupled with a silicon phototransistor in a dual in−line package.

- Switching speeds: 3μs (typ.)
- DC current transfer ratio: 100% (min.)
- Isolation resistance: $10^{11}\Omega$ (min.)
- Isolation voltage: 2500Vrms (min.)
- UL recognized: UL1577, file no. E67349

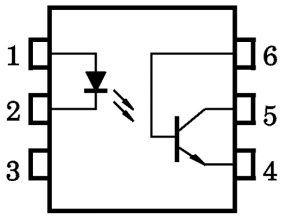
Unit in mm



TOSHIBA 11−7A8

Weight: 0.4 g

Pin Configurations(top view)



1 : ANODE
2 : CATHODE
3 : N.C.
4 : EMITTER
5 : COLLECTOR
6 : BASE

Maximum Ratings (Ta = 25°C)

	Characteristic		Symbol	Rating	Unit
LED	Forward current (continuous)		I_F	60	mA
	Forward current derating		ΔI_F/°C	0.8 (*)	mA / °C
	Peak forward current	(Note 1)	I_{PF}	3	A
	Power dissipation		P_D	100	mW
	Power dissipation derating		ΔP_D / °C	1.33 (*)	mW / °C
	Reverse voltage		V_R	6	V
Detector	Collector−emitter voltage		BV_{CEO}	30	V
	Collector−base voltage		BV_{CBO}	70	V
	Emitter−collector voltage		BV_{ECO}	7	V
	Collector current (continuous)		I_C	100	mA
	Power dissipation		P_C	300	mW
	Power dissipation derating		ΔP_C / °C	4.0 (*)	mW / °C
Coupled	Storage temperature		T_{stg}	−55~150	°C
	Operating temperature		T_{opr}	−55~100	°C
	Lead soldering temperature (at 10 s)		T_{sol}	260	°C
	Total package power dissipation		P_T	300	mW
	Total package power dissipation derating		ΔP_T / °C	3.3 (*)	mW / °C
	Input to output isolation voltage (AC, 1 minute)		BV_S	2500	Vrms
		4N35	BV_S (**)	2500 / 3550	Vrms / Vpk
		4N36		1750 / 2500	
		4N37		1050 / 1500	

(Note 1) Pulse width 1μs, 300pps

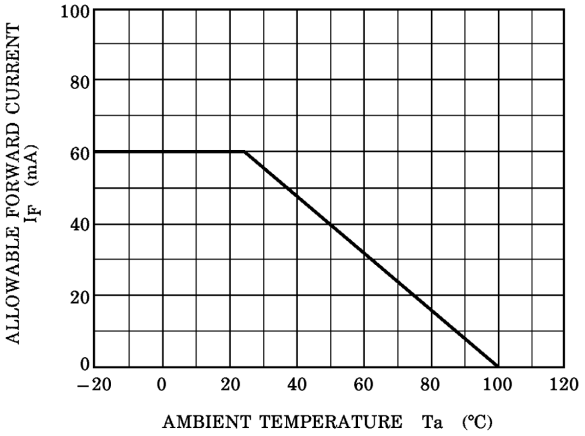
(*) Above 25°C ambient.

(**) JEDEC registered maximum BV_S, however, TOSHIBA specifies a maxium BV_S of 2500V_{rms}, 1 minute.

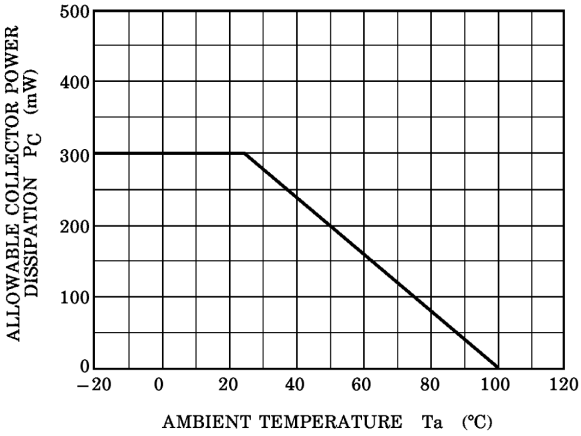
Electrical Characteristics (Ta = 25°C)

	Characteristic		Symbol	Test Condition	Min.	Typ.	Max.	Unit
LED	Forward voltage		V_F	I_F = 10 mA	0.8	1.15	1.5	V
				I_F = 10 mA, Ta = −55°C	0.9	—	1.7	
				I_F = 10 mA, Ta = 100°C	0.7	—	1.4	
	Reverse current		I_R	V_R = 6 V	—	—	10	μA
	Capacitance		C_D	V = 0, f = 1 MHz	—	30	100	pF
Detector	DC forward current gain		h_{FE}	V_{CE} = 5V, I_C = 500 μA	—	200	—	—
	Collector−emitter breakdown voltage		$V_{(BR)\ CEO}$	I_C = 10 mA	30	—	—	V
	Collector−base breakdown voltage		$V_{(BR)\ CBO}$	I_C = 100 μA	70	—	—	V
	Emitter−collector breakdown voltage		$V_{(BR)\ ECO}$	I_E = 100 μA	7	—	—	V
	Collector dark current		I_{CEO}	V_{CE} = 10 V	—	1	50	nA
	Collector dark current		I_{CEO}	V_{CE} = 30 V, Ta = 100°C	—	—	500	μA
	Collector−emitter capacitance		C_{CE}	V = 0, f = 1 MHz	—	10	—	pF
Coupled	Current transfer ratio		I_C / I_F	I_F = 10 mA, V_{CE} = 10 V	100	—	—	%
				I_F = 10 mA, V_{CE} = 10 V Ta = −55°C	40	—	—	
				I_F = 10 mA, V_{CE} = 10 V Ta = 100°C	40	—	—	
	Collector−emitter saturation voltage		$V_{CE\ (sat)}$	I_F = 10 mA, I_C = 0.5 mA	—	0.1	0.3	V
	Capacitance input to output		C_S	V_S = 0, f = 1 MHz	—	0.8	2.5	pF
	Isolation resistance		R_S	V_S = 500 V, R.H.≤ 60 %	10^{11}	—	—	Ω
	Input to output isolation current (pulse width = 8ms)	4N35	I_{IO}	V_{io} = 3550 Vpk	—	—	100	μA
		4N36		V_{io} = 2500 Vpk	—	—	100	
		4N37		V_{io} = 1500 Vpk	—	—	100	
	Turn−on time		t_{ON}	V_{CC} = 10 V, I_C = 2 mA R_L = 100Ω	—	3	10	μs
	Turn−off time		t_{OFF}		—	3	10	

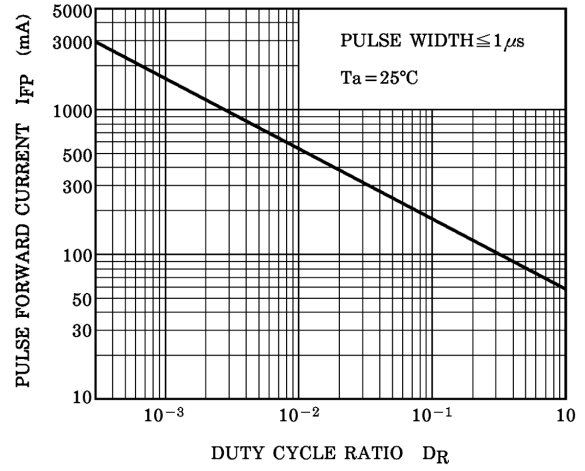
$I_F - T_a$



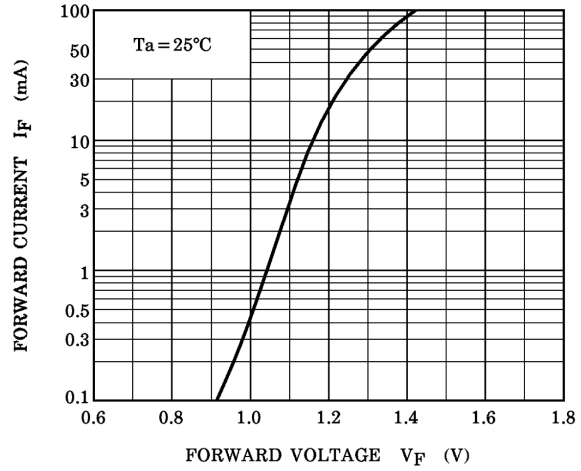
$P_C - T_a$



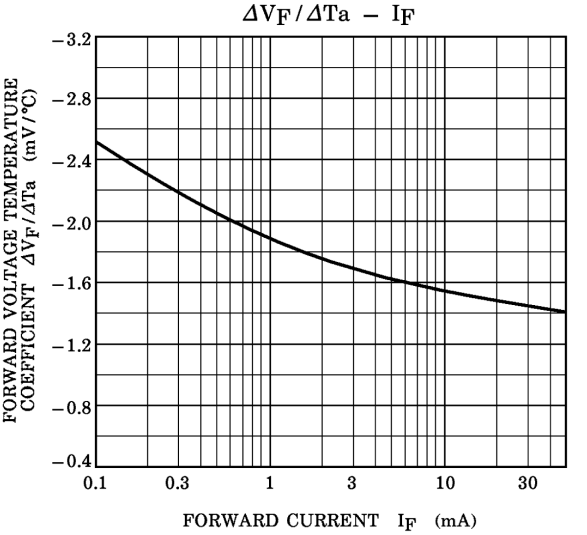
$I_{FP} - D_R$



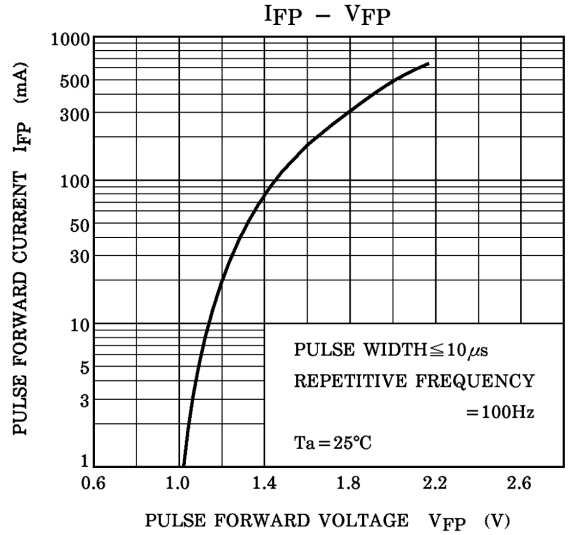
$I_F - V_F$



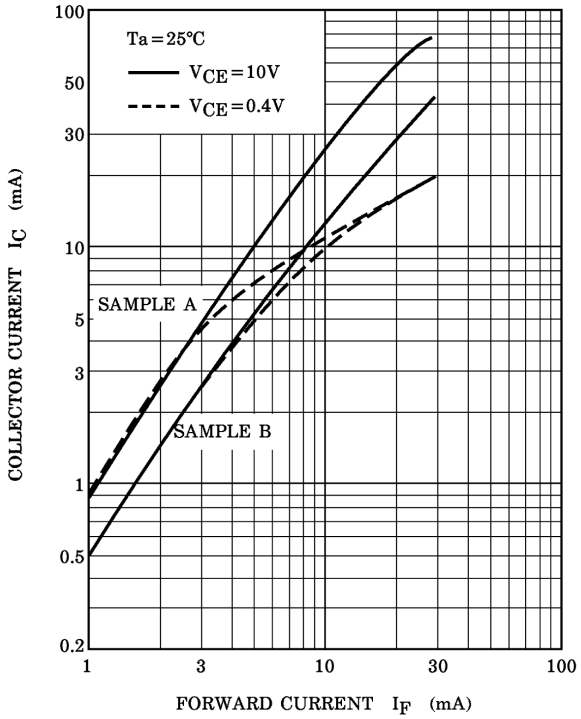
$\Delta V_F / \Delta Ta - I_F$



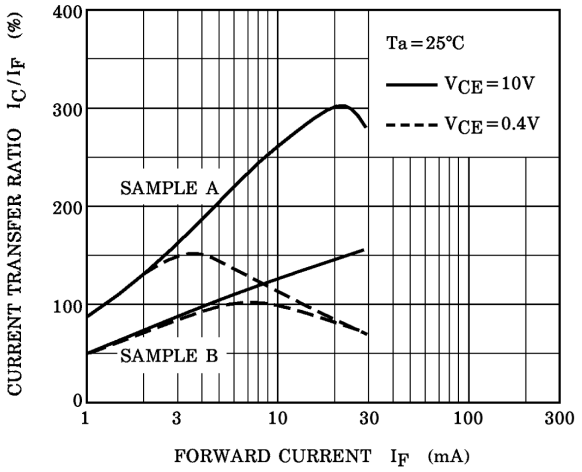
$I_{FP} - V_{FP}$



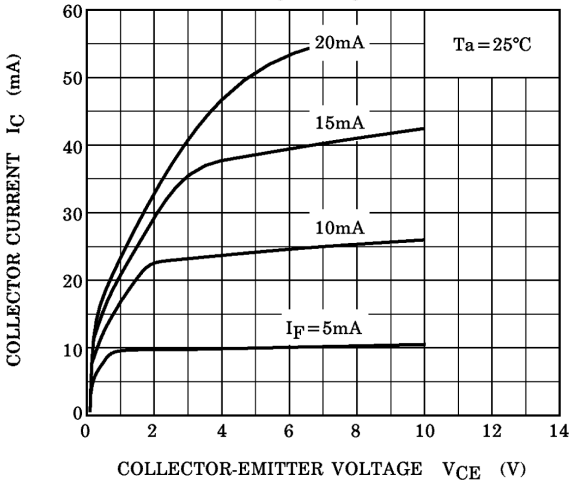
$I_C - I_F$



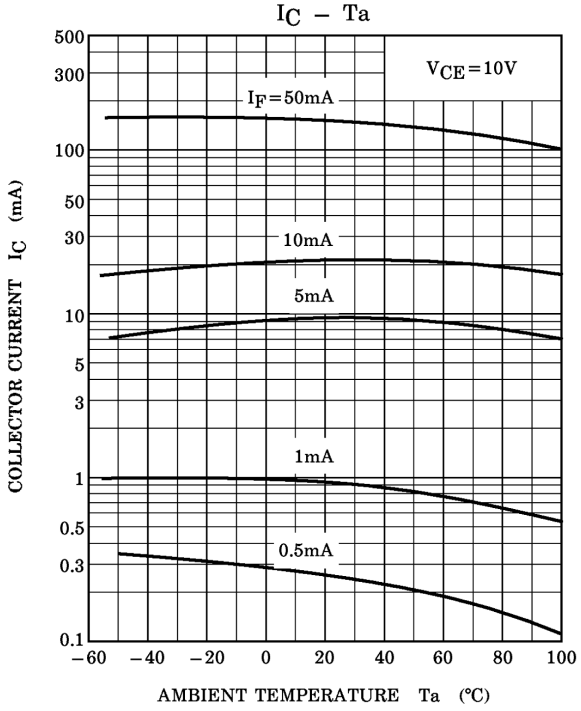
$I_C / I_F - I_F$



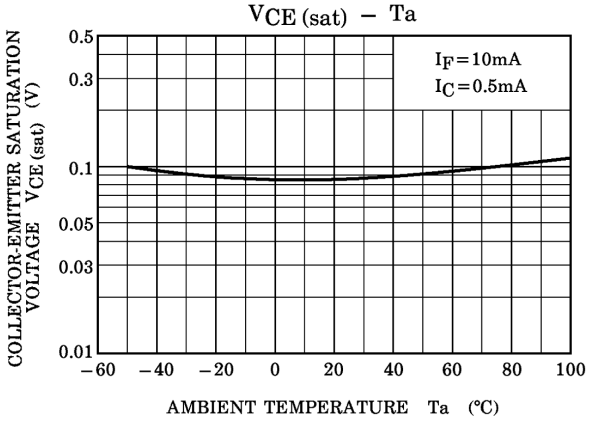
$I_C - V_{CE}$



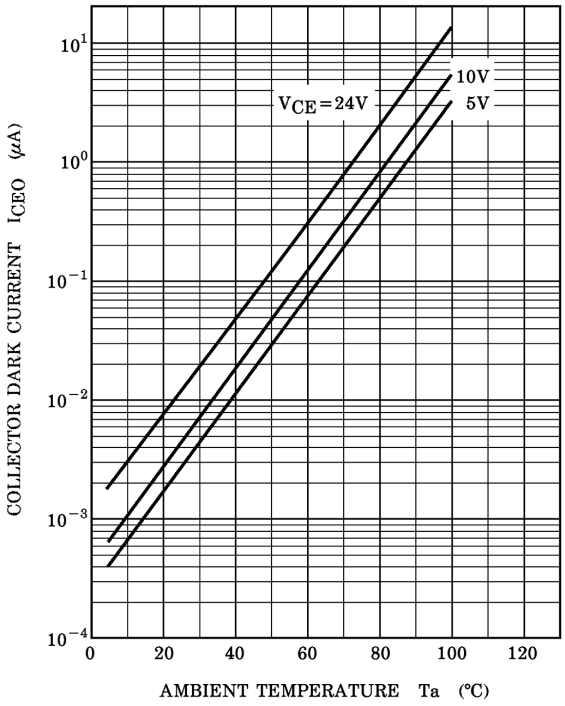
$I_C - Ta$



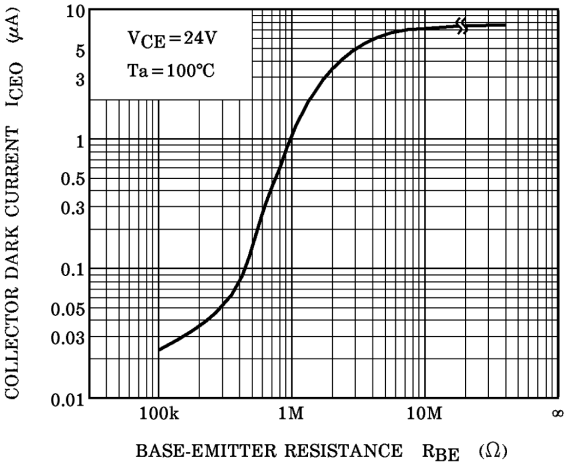
$V_{CE}\,(sat) - Ta$



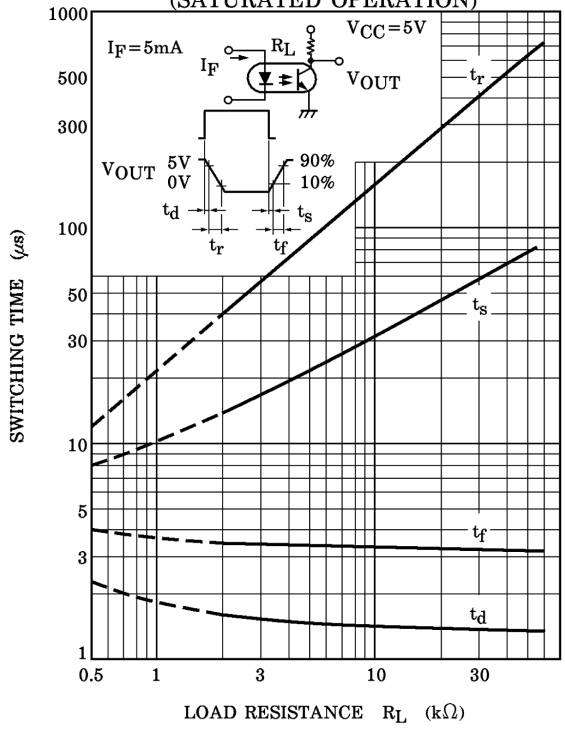
I_{CEO} – Ta



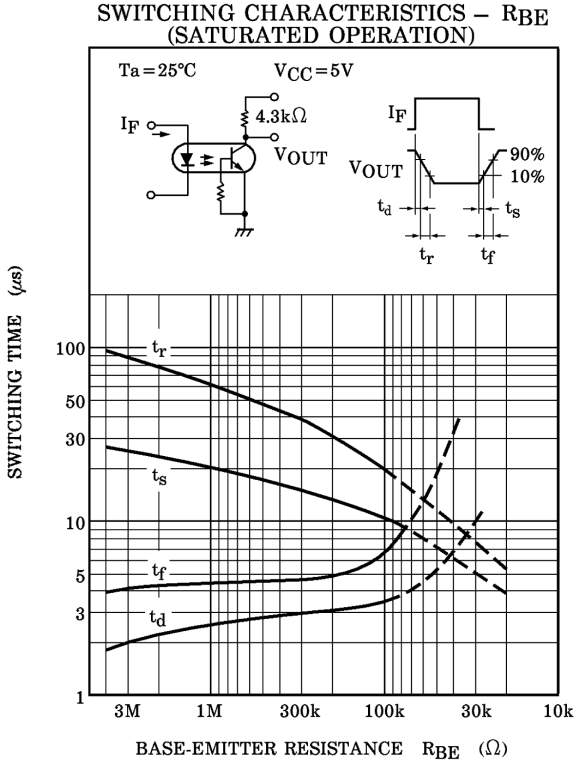
I_{CEO} – R_{BE}



SWITCHING CHARACTERISTICS – R_L (SATURATED OPERATION)



SWITCHING CHARACTERISTICS – R_{BE} (SATURATED OPERATION)



RESTRICTIONS ON PRODUCT USE

000707EBC

- TOSHIBA is continually working to improve the quality and reliability of its products. Nevertheless, semiconductor devices in general can malfunction or fail due to their inherent electrical sensitivity and vulnerability to physical stress. It is the responsibility of the buyer, when utilizing TOSHIBA products, to comply with the standards of safety in making a safe design for the entire system, and to avoid situations in which a malfunction or failure of such TOSHIBA products could cause loss of human life, bodily injury or damage to property.
  In developing your designs, please ensure that TOSHIBA products are used within specified operating ranges as set forth in the most recent TOSHIBA products specifications. Also, please keep in mind the precautions and conditions set forth in the “Handling Guide for Semiconductor Devices,” or “TOSHIBA Semiconductor Reliability Handbook” etc..
- The TOSHIBA products listed in this document are intended for usage in general electronics applications (computer, personal equipment, office equipment, measuring equipment, industrial robotics, domestic appliances, etc.). These TOSHIBA products are neither intended nor warranted for usage in equipment that requires extraordinarily high quality and/or reliability or a malfunction or failure of which may cause loss of human life or bodily injury (“Unintended Usage”). Unintended Usage include atomic energy control instruments, airplane or spaceship instruments, transportation instruments, traffic signal instruments, combustion control instruments, medical instruments, all types of safety devices, etc.. Unintended Usage of TOSHIBA products listed in this document shall be made at the customer’s own risk.
- Gallium arsenide (GaAs) is a substance used in the products described in this document. GaAs dust and fumes are toxic. Do not break, cut or pulverize the product, or use chemicals to dissolve them. When disposing of the products, follow the appropriate regulations. Do not dispose of the products with other industrial waste or with domestic garbage.
- The products described in this document are subject to the foreign exchange and foreign trade laws.
- The information contained herein is presented only as a guide for the applications of our products. No responsibility is assumed by TOSHIBA CORPORATION for any infringements of intellectual property or other rights of the third parties which may result from its use. No license is granted by implication or otherwise under any intellectual property or other rights of TOSHIBA CORPORATION or others.
- The information contained herein is subject to change without notice.

X-ON Electronics

Largest Supplier of Electrical and Electronic Components

Click to view similar products for MOSFET Output Optocouplers ***category:***

Click to view products by Toshiba ***manufacturer:***

Other Similar products are found below :

TLP3131(F) TLP598GAF CPC2014NTR TLP4026G(F) LTV-817S-B CPC2017NTR TLP152(TPL,E(T PS2505L-4-E3-A TLP3106A(TP,F TLP3107A(F TLP3106A(F TLP4176A(F TLP3149(F TLP3147(F TLP3145(F TLP3146(F TLP3149(TP,F H11AV1XSM CNY17-1-000E CNY17-1-300E CNY17-1S CNY17-2-000E CNY17-2S CNY173SR2VM CNY17-4-000E HCPL-181-06DE HCPL-J312-000E LTV-3120S-TA1 LTV-817-L LTV-817M-D LTV-817S-A TIL111 TIL191 MCT6X MCT6XSM TLP170A(F) TLP170G(F) TLP197GA(F) TLP197G(TP,F) TLP222A-2(LF1,F) TLP291(GR-TP.E(O TLP597A(F) TLP797J(F) 4N35X 4N35XSM MOC213M HMHA2801R2 ILQ2X IS357A ISP521-1X