"OPTO-HYBRID" INTEGRATED CIRCUITS

Combination of thick film hybrid integrated circuits with photosensitive elements provides unique advantage for such photosensor applications as encoders, tape and card readers, and position or motion detection. Thick film interface circuitry within the same package as the photosensors provides to the user a convenient functional sub-system which can be cost compatible with discrete interface circuitry.

In general, the output of available photosensitive devices requires signal conditioning to obtain useful signal levels and characteristics. Historically, design of this interface circuitry has been done by the systems manufacturer whose challenge was frequently to design around shortcomings of existing devices because he was not in a position to exercise device design trade-offs in obtaining a device more compatible with his application. Control of both device and circuitry by the device manufacturer facilitates optimization of the combination in terms of performance. For example, thick film amplifier/digitizer circuits can provide TTL/CMOS compatible output levels with excellent response speed. High sensitivity to input light, a sharp switching threshold, and close channel-to-channel matching of sensitivity can be achieved. Location of the interface circuitry at the photosensors eliminates noise pickup associated with transmission of low level signals through an electrically noisy environment to remote amplifers.

INTERRUPTERS OTS-40 SERIES

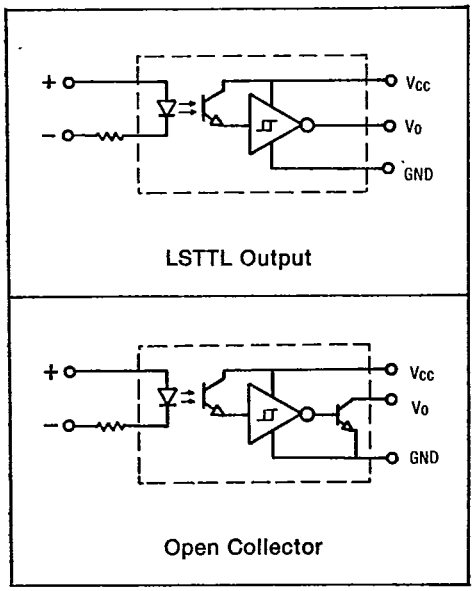
Opto Technology's OTS-40 series optical switches feature a high efficiency gallium arsenide infrared emitting diode and silicon phototransistor. All switches are of hybrid construction for greater reliability and each switch utilizes a Schmitt Trigger level detector for fast (low nanosecond) precise switching. This series provides options for LSTTL positive or negative true logic output or open collector with positive or negative true output. With the OTS-40 series, non-contact switching is provided with up to 10,000 operations per second.

ELECTRICAL CHARACTERISTICS (25° unless otherwise noted)

DETECTOR		LSTTL OUTPUT			OPEN COLLECTOR			
PARAMETER	TEST CONDITIONS	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.	UNIT
V_{OH} High-Level Output Voltage	V_{CC} = 4.75 V, I_{OH} = 400 µA	2.7	3.4					V
V_{OL} Low-Level Output Voltage	V_{CC} = 4.75 V, I_{OL} = 8 mA		.34	.5				V
I_{OH} Low-Level Output Current				-400				µA
I_{OL} Low-Level Output Current				8				mA
$V_{CE\ (SAT)}$ Collector-Emitter Saturation Voltage	I_C = 100 mA						.3	V
V_{CEO} Collector-Emitter Breakdown Voltage	I_C = 10 mA				40			V
t_r & t_f Rise and Fall Time*	C_L = 15 pf, R_L = 2KΩ		15	22		60	150	nS
V_{CC} Supply Voltage		4.75	5	5.25	4.75	5	5.25	V
I_{CC} Supply Current	V_{CC} = 5.25 V		15	25		15	25	mA
Hysteresis			10			10		%

*Output to Ground

INFRARED EMITTER	MIN.	TYP.	MAX.	UNIT
V_F Forward Voltage @ I_C = 50 mA		1.3	1.5	V
I_F Continuous Forward Current		20	50	mA



ELECTRICAL SCHEMATICS

ABSOLUTE MAXIMUM RATINGS

Supply Voltage, V_{CC} ..... -0.5 V to 7V
Operating Temperature Range ..... 0°C to 70°C
Storage Temperature Range ..... -55°C to 100°C
Power Dissipation ..... 300 MW

PART NUMBER INFORMATION

(1) (2) (3)
OTS - 4X - X X

(1) = Package Type (1 or 2)
(2) L = LSTTL Output
C = Open Collector Output
(3) P = Logic Level High (No Interruption)
N = Logic Level Low (No Interruption)