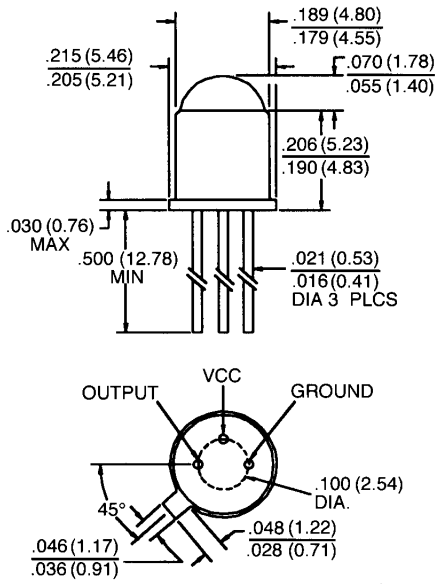
OPTOELECTRONICS

OPTOLOGIC™

QSA156/157/158/159

PACKAGE DIMENSIONS



ST2139

DESCRIPTION

The QSA15X family are OPTOLOGIC™ ICs which feature a Schmitt trigger at output which provides hysteresis for noise immunity and pulse shaping. The basic building block of this IC consists of a photodiode, a linear amplifier, voltage regulator, Schmitt trigger and four output options. The TTL/LSTTL compatible output can drive up to ten TTL loads over supply currents from 4.5 to 16.0 volts. The monolithic die is packaged in a narrow angle, hermetically sealed, TO-18 metal can package.

FEATURES

- High noise immunity.
- Direct TTL/LSTTL interface.
- Hermetically sealed package.
- Reception angle of ±12°.

ABSOLUTE MAXIMUM RATINGS (T_A = 25°C Unless Otherwise Specified)

Supply Voltage, V_{CC}	18 volts
Storage Temperature	−65°C to +125°C
Operating Temperature	−55°C to +105°C
Soldering:	
Lead Temperature (Iron)	240°C for 5 sec. [2,3,4,5]
Lead Temperature (Flow)	260°C for 10 sec. [2,3,5]
Power Dissipation	250 mW[1]
Duration of Output short to V_{CC}	1.00 sec.
Voltage at Output	35 volts
Sinking Current	50 mA
Sourcing Current (QSA156, QSA157)	10 mA
Irradiance	3.0 mW/cm²

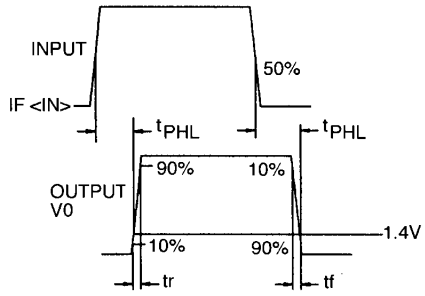
ELECTRICAL CHARACTERISTICS (T_A = −40°C to +85°C) (V_{CC} = 4.5 to 16 volts)

PARAMETER	SYMBOL	MIN.	TYP.	MAX.	UNITS	TEST CONDITIONS
Operating Supply Voltage	V_{CC}	4.5		16.0	V	
Positive Going Threshold Irradiance[6]	Ee (+)	0.025		0.250	mW/cm²	T_A = 25°C
Hysteresis Ratio	Ee(+)/Ee(−)	1.10		2.00		
Supply Current	I_{CC}	—		12.0	mA	Ee = 0 or .3 mW/cm² [6]
Peak to peak ripple which will cause false triggering		—		2.00	V	f = DC to 50 MHZ
QSA156 (BUFFER TOTEM POLE)						
High Level Output Voltage	V_{OH}	V_{CC} − 2.1		—	V	Ee = .3 mW/cm², I_{OH} = −1.0 mA[6]
Low Level Output Voltage	V_{OL}	—		0.40	V	Ee = 0, I_{OL} = 16 mA
QSA157 (INVERTER TOTEM POLE)						
High Level Output Voltage	V_{OH}	V_{CC} − 2.1		—	V	Ee = 0, I_{OH} = −1.0 mA
Low Level Output Voltage	V_{OL}	—		0.40	V	Ee = .3 mW/cm², I_{OL} = 16 mA[6]
QSA158 (BUFFER OPEN COLLECTOR)						
High Level Output Current	I_{OH}	—		100	μA	Ee = .3 mW/cm², V_{OH} = 30 V[6]
Low Level Output Voltage	V_{OL}	—		0.40	V	Ee = 0, I_{OL} = 16 mA
QSA159 (INVERTER OPEN COLLECTOR)						
High Level Output Current	I_{OH}	—		100	μA	Ee = 0, V_{OH} = 30 V
Low Level Output Voltage	V_{OL}	—		0.40	V	Ee = .3 mW/cm², I_{OL} = 16 mA[6]

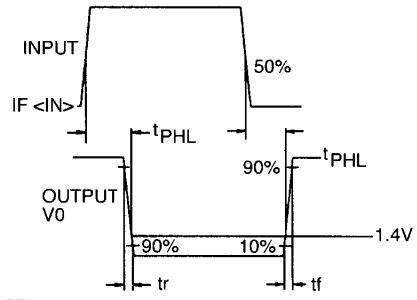
ELECTRICAL CHARACTERISTICS (T_A = −40°C to +85°C) (V_{CC} = 4.5 to 16 volts)

PARAMETER	SYMBOL	MIN.	TYP.	MAX.	UNITS	TEST CONDITIONS
QSA156, QSA157						
Output rise, fall times	tr, tf	—		70	nS	Ee=0 or .3 mW/cm², f=10K HZ DC=50%, R_L=10 TTL loads
Propagation delay	tphl, tplh		6.0		μS	
QSA158, QSA159						
Output rise, fall times	tr, tf	—		100	nS	Ee=0 or .3 mW/cm², f=10K HZ DC=50%, R_L=300Ω[6]
Propagation delay	tphl, tplh		6.0		μS	

Switching Test Curve For Buffers



Switching Test Curve For Inverters



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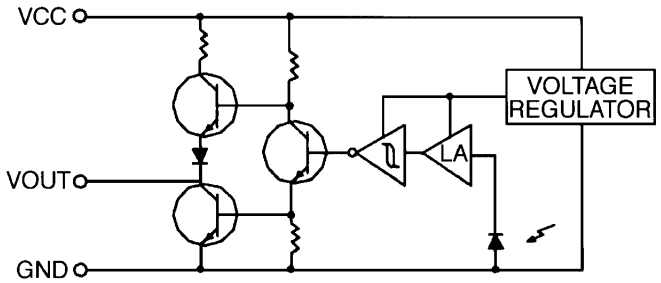
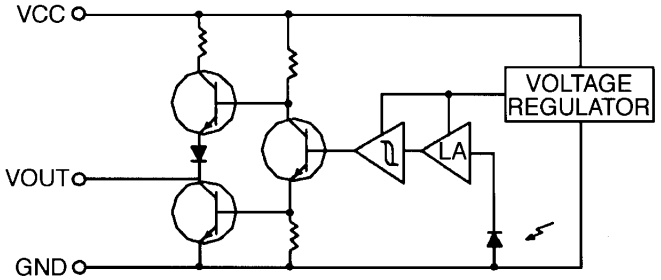
NOTES

1. *Derate power dissipation linearly 2.50 mW/°C above 25°C.*
2. *RMA flux is recommended.*
3. *Methanol or Isopropyl alcohols are recommended as cleaning agents.*
4. *Soldering iron tip 1/16" (1.6 mm) minimum from housing.*
5. *As long as leads are not under any stress or spring tension.*
6. *Irradiance measurements are made with an AlGaAs LED emitting light at a peak wavelength of 880 nm.*

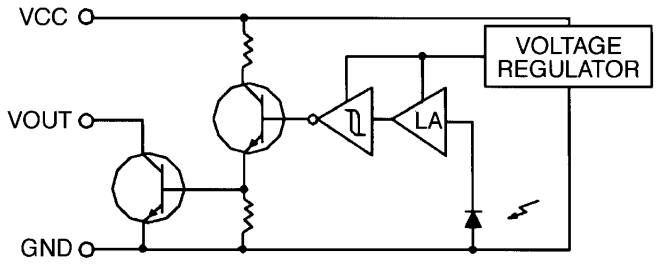
CIRCUIT SCHEMATICS



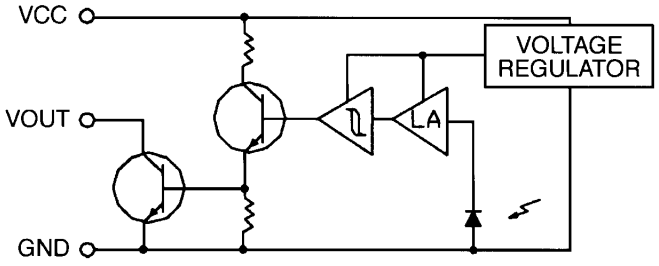
QSA156
Totem-Pole Output Buffer



QSA157
Totem-Pole Output Inverter



QSA158
Open-Collector Output Buffer



QSA159
Open-Collector Output Inverter

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