SOLID STATE OPTRONICS

STS710



Multifunction
Telecommunications Switch

DESCRIPTION

The STS710 is a multi-function telecommunications switch. It combines a 1 Form A solid state relay, phototransistor, zener diode, darlington transistor and a bridge rectifier in a 16-pin SOIC package.The solid state relay is comprised of an infrared LED optically coupled to a Photo Diode Array that drives two back-to-back MOSFETs. The optocoupler consists of back-to-back infrared LEDs coupled to a Photo-Transistor. Its small outline and low height make the STS710 an ideal choice in telecom circuits where function integration and reduction of board space are essential.

FEATURES

- Miniature 16pin SOIC package
- Function integration, including Zener Diode protection
- High Blocking Voltage (400V, relay portion)
- Low input control current (2.5mA TYP, relay portion)
- Low On-Resistance (30 ohms MAX, relay portion)
- High Load Current (120mA MAX, relay portion)
- High Input - Ouptut Isolation (1.5kV MIN, relay portion)
- Long life / high reliability

APPLICATIONS

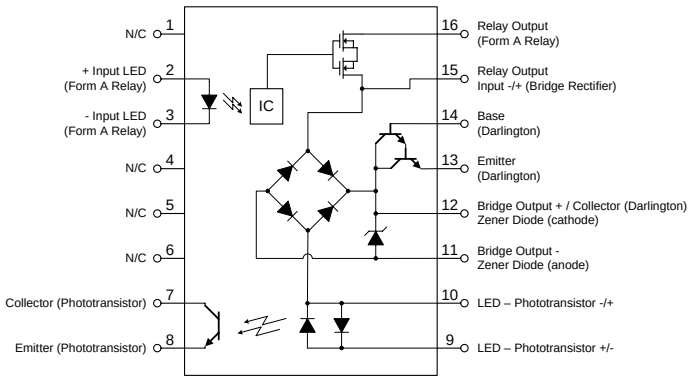
- Telecom switching
- PCMCIA cards
- Fax/modem modules
- Set-top boxes
- DAA arrangements
- Hookswitch
- Loop current detect
- Pulse dialing

OPTIONS/SUFFIXES*

- -TR Tape & Reel Packaging

NOTE: Suffixes listed above are not included in marking on device for part number identification.

SCHEMATIC DIAGRAM



ABSOLUTE MAXIMUM RATINGS*

PARAMETER	UNIT	MIN	TYP	MAX
Storage Temperature	°C	-55		120
Operating Temperature	°C	-40		85
Continuous Input Current	mA			40
Transient Input Current	mA			400
Reverse Input Control Voltage	V	6		
Output Power Dissipation	mW			500

*The values indicated are absolute stress ratings. Functional operation of the device is not implied at these or any conditions in excess of those defined in electrical characteristics section of this document. Exposure to Absolute Ratings may cause permanent damage to the device and may adversely affect reliability.

APPROVALS

- BABT APPROVED TO (BSI) EN60950, (BSI) EN60065
- UL/ C-UL Approved

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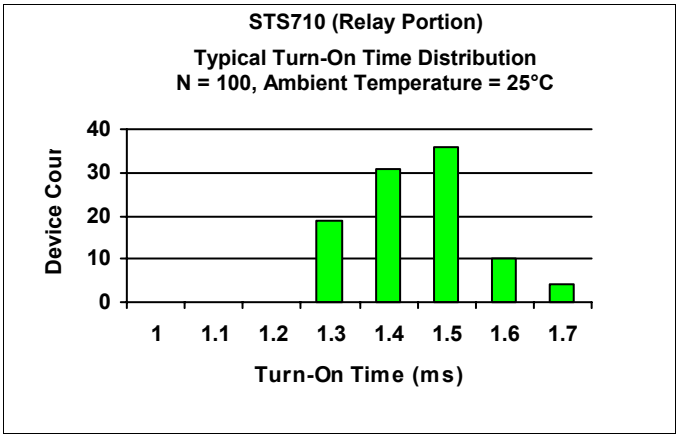
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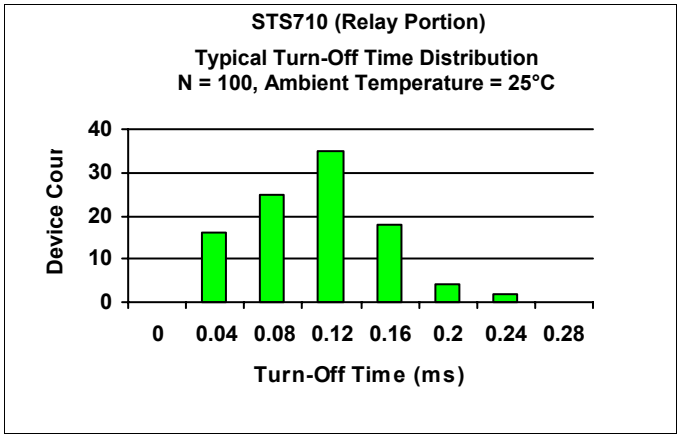
ELECTRICAL CHARACTERISTICS - 25°C

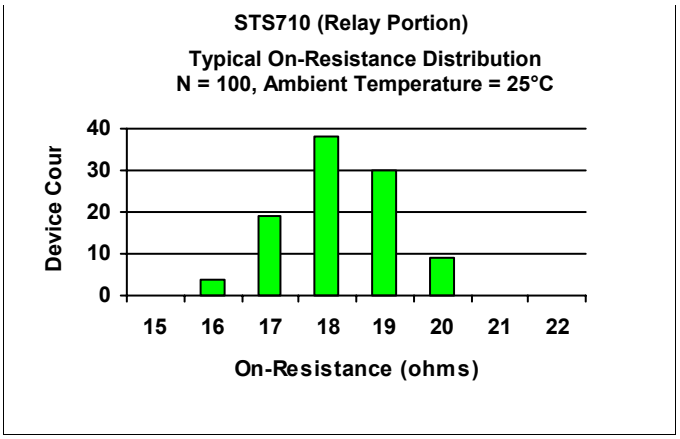
PARAMETER	UNIT	MIN	TYP	MAX	TEST CONDITIONS
RELAY INPUT SPECIFICATIONS					
LED Forward Voltage	V		1.2	1.5	If = 10mA
LED Reverse Voltage	V	6	12		Ir = 10uA
Turn-On Current	m A		2.5	10	Io = 120mA
Turn-Off Current	m A		0.5		
RELAY OUTPUT SPECIFICATIONS					
Blocking Voltage	V	400			Io = 1uA
Continuous Load Current	m A			120	If = 10mA
On-Resistance	Ω		18	30	Io = 120mA
Leakage Current	μ A		0.2	1	Vo = 400V
Output Capacitance	p F		25	50	Vo = 25V, f = 1.0MHz
Offset Voltage	m V			0.2	If = 10mA
RELAY COUPLED SPECIFICATIONS					
Turn-On Time	m s		2	5	If = 10mA, Io = 120mA
Turn-Off Time	m s		0.5	1	If = 10mA, Io = 120mA
OPTOCOUPLER INPUT SPECIFICATIONS					
LED Forward Voltage	V		1.2	1.5	If = 10mA
Turn-On Current	m A	2			Io = 0.5mA
Reverse Current	μ A			10	Vr = 4V
Terminal Capacitance	p F		30	250	V = 0, f = 1kHz
OPTOCOUPLER OUTPUT SPECIFICATIONS					
Collector - Emitter Breakdown Voltage	V	60			Io = 10uA, If = 0
Emitter - Collector Breakdown Voltage	V	5			Io = 100uA, If = 0
Collector Dark Current	μ A			0.1	Vce = 20V, If = 0
Floating Capacitance	p F		0.6	1	V = 0V, f = 1.0MHz
Vce Saturation Voltage	V		0.1	0.3	If = 20mA, Ic = 1mA
Current Transfer Ratio	%	30	100	800	If = 5mA, Vce = 5V
Rise Time	μ s		5	20	Ic = 2mA, Vce = 2V, RL = 100 ohms
Fall Time	μ s		4	20	Ic = 2mA, Vce = 2V, RL = 100 ohms
FULL WAVE BRIDGE RECTIFIER					
Reverse Voltage	V	100			Io = 10uA
Forward Voltage Drop	V		1.5	1.8	Io = 120mA
Reverse Leakage Current	μ A			10	Vr = 100V

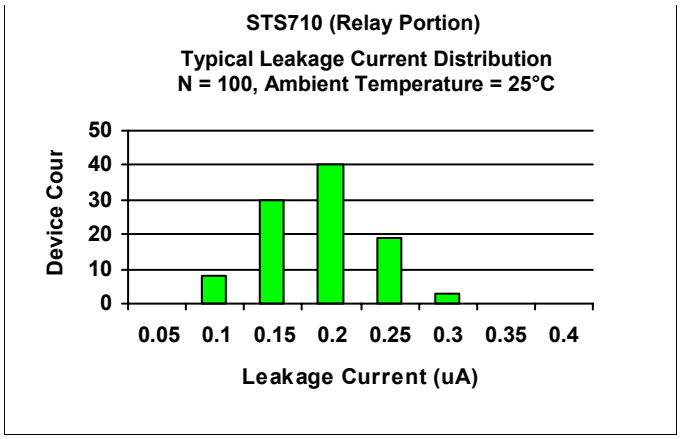
Continuous Load Current	m A			140	
Peak Forward Current	m A			500	T = 10us
DARLINGTON TRANSISTOR					
Collector-Emitter Breakdown Voltage	V	40			Ic = 10uA, Ib = 0
Continuous Collector Current	m A			120	Vce = 5V
Collector-Emitter Leakage Current	µ A		0.5	1	Vce = 10V
Saturation Voltage	V			1.5	Ic = 120mA, Ib = 10mA
ZENER DIODE SPECIFICATIONS					
Zener Voltage	V		15		Izt = 20mA
DEVICE SPECIFICATIONS					
Contact Transient Ratio	V / µ s	2000	7000		dV = 50V
Coupled Capacitance	p F			2	
Isolation Voltage	V	1500			T = 1 minute

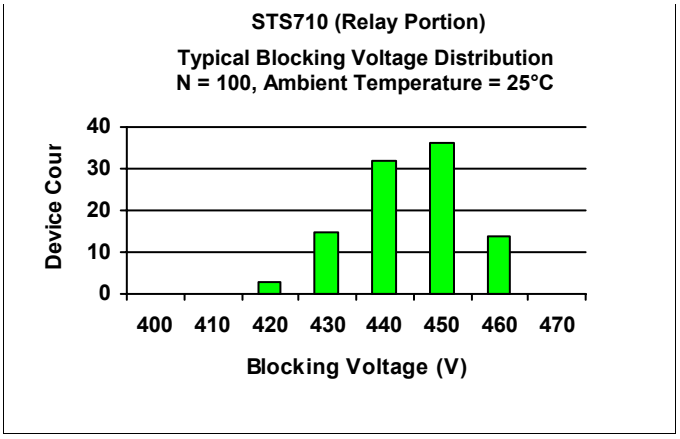
PERFORMANCE DATA

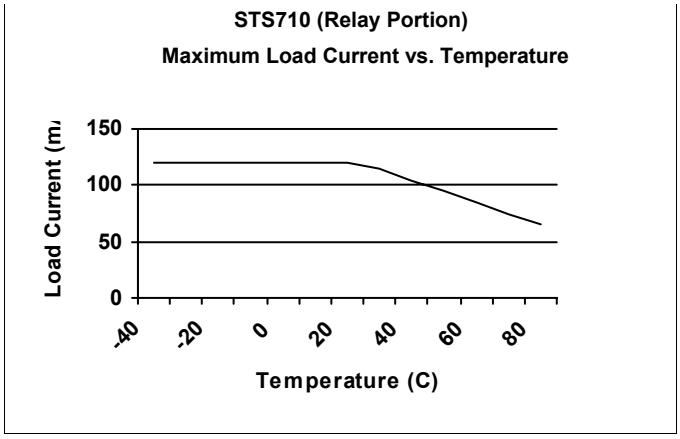










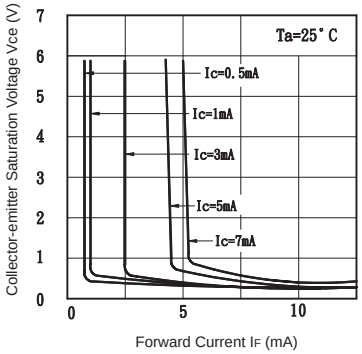


PERFORMANCE DATA

STS710 (Optocoupler Portion)

Collector-Emitter Saturation Voltage vs. Forward Current

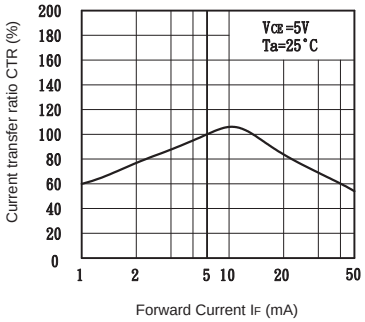
N = 100, Ambient Temperature = 25°C



STS710 (Optocoupler Portion)

Current Transfer Ratio vs. Forward Current

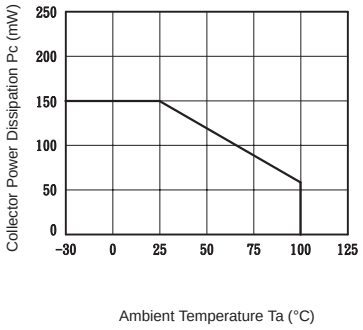
N = 100, Ambient Temperature = 25°C



STS710 (Optocoupler Portion)

Collector Power Dissipation vs. Ambient Temperature

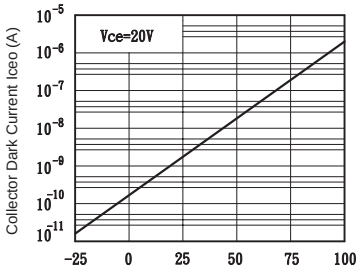
N = 100



STS710 (Optocoupler Portion)

Collector Dark Current vs. Ambient Temperature

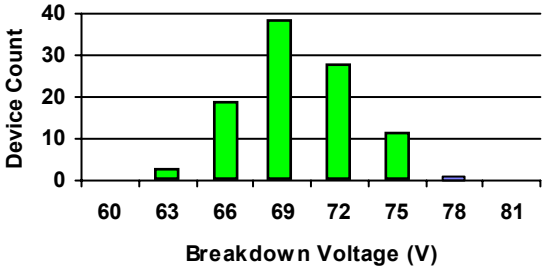
N = 100



STS710 (Optocoupler Portion)

Typical Vceo Distribution

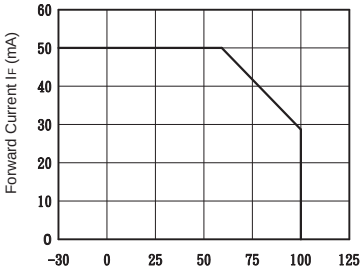
N = 100, Ambient Temperature = 25°C



STS710 (Optocoupler Portion)

Forward Current vs. Ambient Temperature

N = 100, Ambient Temperature = 25°C

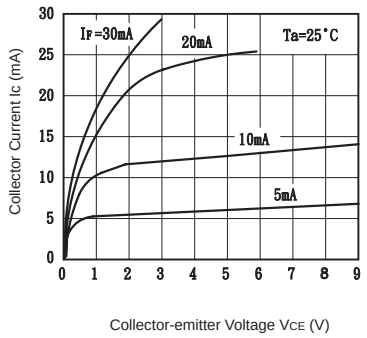


PERFORMANCE DATA

STS710 (Optocoupler Portion)

Collector Current vs. Collector-Emitter Voltage

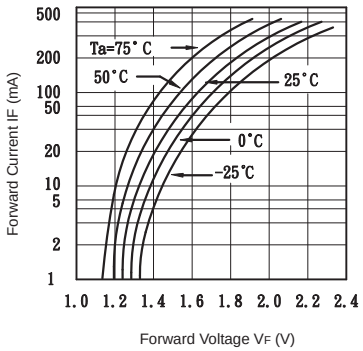
N = 100, Ambient Temperature = 25°C



STS710 (Optocoupler Portion)

Forward Current vs. Forward Voltage

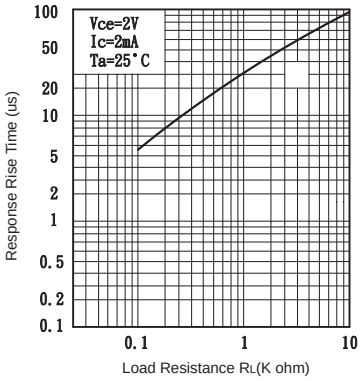
N = 100, Ambient Temperature = 25°C



STS710 (Optocoupler Portion)

Rise Time vs. Load Resistance

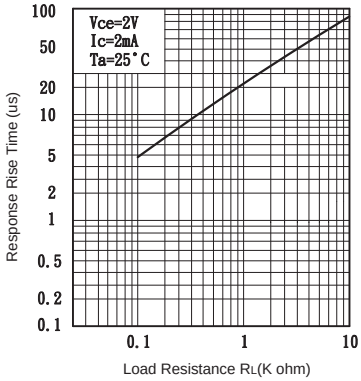
N = 100, Ambient Termperature = 25°C



STS710 (Optocoupler Portion)

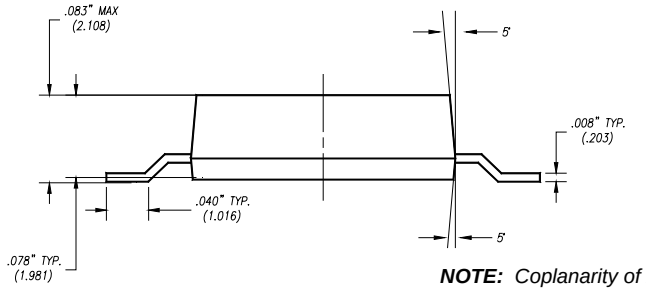
Fall Time vs. Load Resistance

N = 100, Ambient Temperature = 25°C



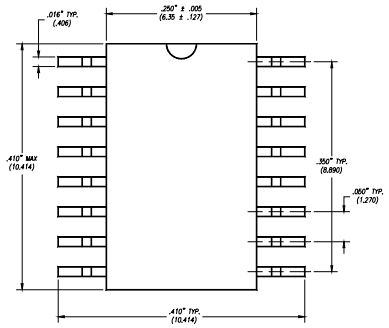
MECHANICAL DIMENSIONS

16 PIN SMALL OUTLINE INTEGRATED CIRCUIT

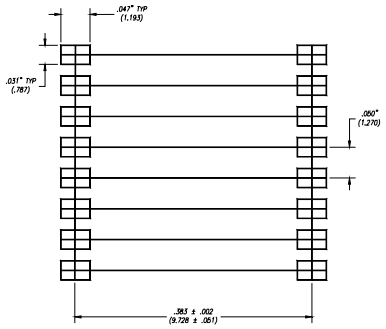


NOTE: *Coplanarity of leads = 0.004" MAXIMUM*

END VIEW



TOP VIEW



BOTTOM VIEW/
BOARD PATTERN

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