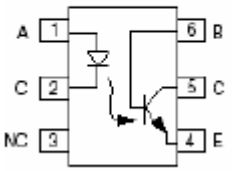
Feature:

- 4N2X: 4N25, 4N26, 4N27, 4N28
- 4N3X: 4N35, 4N36, 4N37, 4N38
- H11AX: H11A1, H11A2, H11A3, H11A4, H11A5
- High Isolation voltage (Viso = 5000V rms)
- Operating Temperature up to 100 ºC
- Meets all JEDEC specifications
- Available in standard DIP, wide lead bend, and surface mount lead bend options.
- Conventional black housing package

Schematic



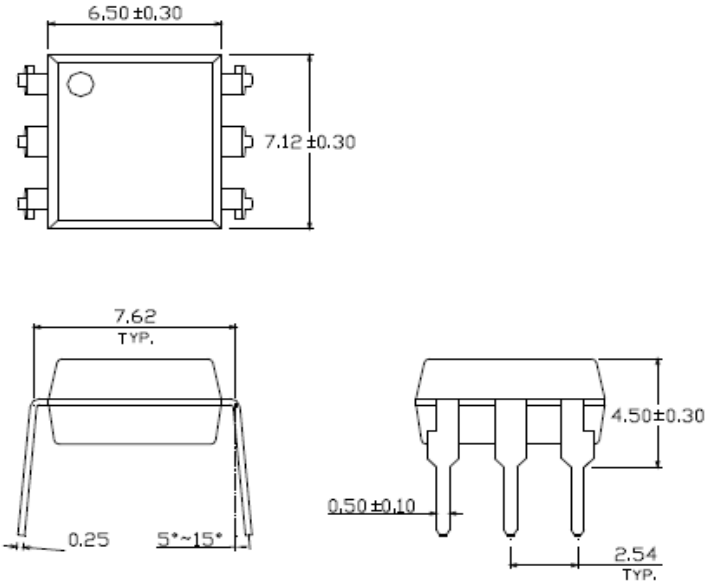
1. Anode
2. Cathode
3. No Connection
4. Emitter
5. Collector
6. Base

Certification & Compliance:

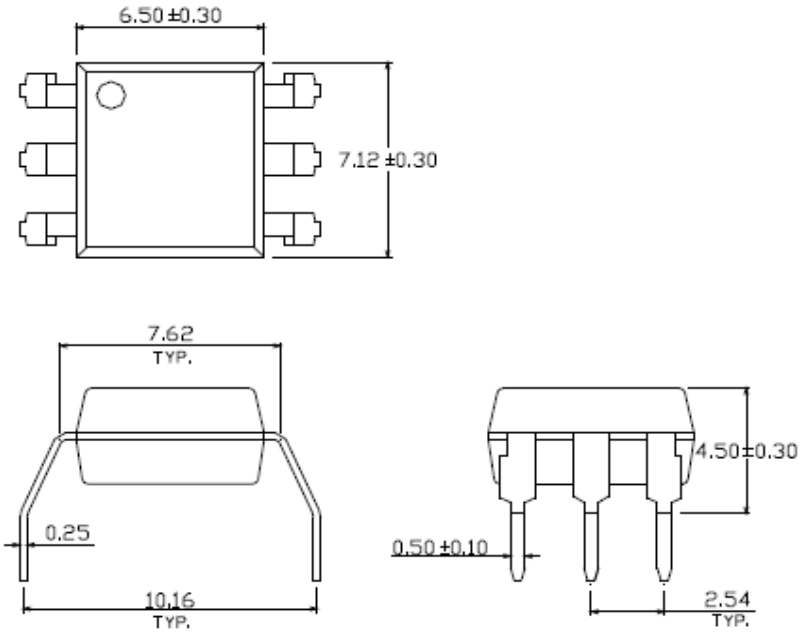
- Pb free and RoHS Compliant
- UL recognized (File # E338132)
- VDE recognized (File # 40030457)

Dimension: (Dot location indicated pin 1)

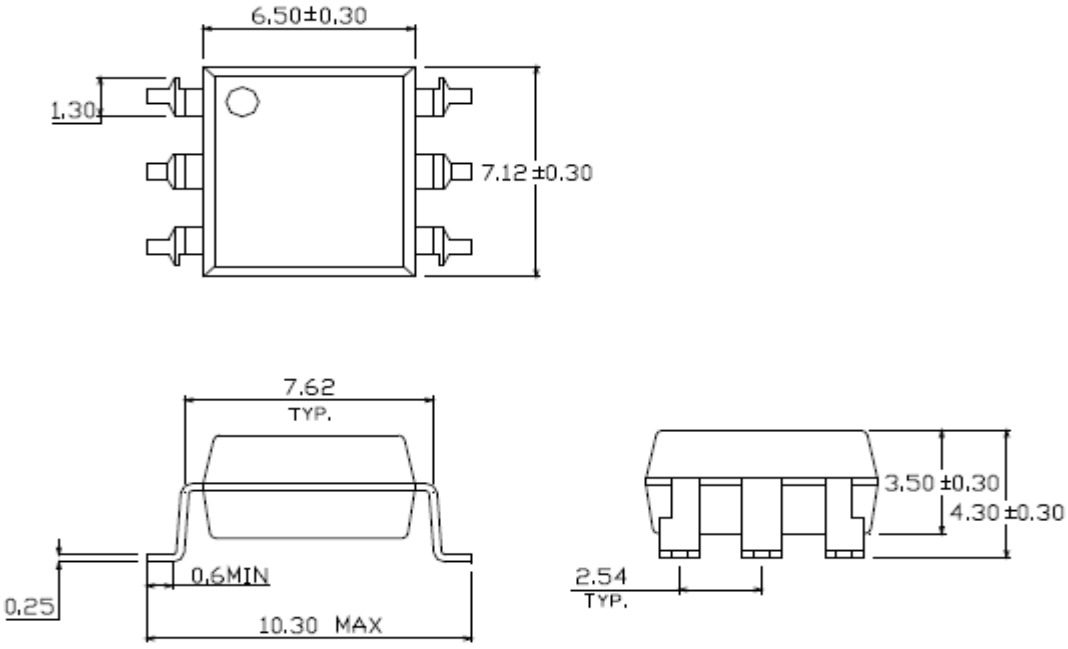
6 Pin DIP option:



Wide lead bend (option W):



SMD lead bend (option S):



- All Dimensions are in mm
- Tolerance = +/- 0.1mm

Absolute Maximum Rating:

Symbol	Parameter	Rating	Units
T_{STG}	Storage Temperature	-55 ~ +150	ºC
T_{OPR}	Operating Temperature	-55 ~ +100	ºC
T_{SOL}	Lead Solder Temperature	260 for 10 sec.	ºC
P_{TOT}	Total Power Dissipation	200	mW
EMITTER			
I_F	Continuous Forward Current	60	mA
I_{FM}	Peak Forward Current (t = 10us)	1	A
V_R	Reverse Voltage	6	V
P_D	Power Dissipation	100	mW
	Power Dissipation Derated above 25ºC	1.41	mW/ºC
DETECTOR			
V_{CEO}	Collector–Emitter Voltage	80	V
V_{CBO}	Collector-Base Voltage	80	V
V_{ECO}	Emitter-Collector Voltage	7	V
V_{EBO}	Emitter-Base Voltage	7	V
P_C	Collector Power Dissipation	150	mW
	Collector Power Dissipation Derated above 25ºC	1.76	mW/ºC

Electrical Characteristic (T_A=25 °C)

Emitter

Symbol	Characteristics	Device	Test Condition	Range			Unit
				Min	Typ	Max	
V_F	Forward Voltage	4N2X 4N3X H11AX	I_F = 10mA	-	1.2	1.5	V
I_R	Reverse Current		V_R = 6V	-	-	10	uA
C_{in}	Input Capacitance		V = 0, f = 1MHz	-	30	-	pF

Detector

Symbol	Characteristic	Device	Test Condition	Range			Unit
				Min	Typ	Max	
I_{CBO}	Collector-Base dark current	-	V_{CB} = 10V	-	-	20	nA
I_{CEO}	Collector-Emitter dark current	4N2X H11AX	V_{CE} = 10V, I_F = 0mA	-	-	50	nA
		4N3X	V_{CE} = 60V, I_F = 0mA	-	-	50	nA
BV_{CEO}	Collector-Emitter breakdown voltage	-	Ic = 1mA	80	-	-	V
BV_{CBO}	Emitter-Base breakdown voltage	-	I_E = 0.1mA	80	-	-	V
BV_{ECO}	Emitter-Collector breakdown voltage	-	I_E = 0.1mA	7	-	-	V
BV_{EBO}	Emitter-Base breakdown voltage	-	I_E = 0.1mA	7	-	-	V
C_{CE}	Collector-Emitter capacitance	-	V_{CE} = 0V, f = 1MHz	-	8	-	pF

DC Transfer Characteristic

Symbol	Characteristic	Device	Test Condition	Range			Unit
				Min	Typ	Max	
CTR	Current Transfer Ratio	4N35, 4N36, 4N37	I_F = 10mA, V_{CE} = 10V	100	-	-	%
		H11A1		50	-	-	
		H11A5		30	-	-	
		4N25, 4N26, 4N38, H11A2, H11A3		20	-	-	
		4N27,4N28, H11A4		10	-	-	
$V_{CE(Sat)}$	Collector-Emitter saturation voltage	4N25,4N26, 4N27, 4N28	I_F = 50mA, I_C =2mA	-	-	0.5	V
		4N35, 4N36, 4N37	I_F = 10mA, I_C =0.5mA	-	-	0.3	
		H11A1, H11A2, H11A3, H11A4, H11A5		-	-	0.4	
		4N38	I_F = 20mA, I_C =4mA	-	-	1.0	

Isolation Characteristic

Symbol	Characteristic	Device	Test Condition	Range			Unit
				Min	Typ	Max	
V_{ISO}	Isolation Voltage	-	-	5000	-	-	V_{rms}
R_{ISO}	Isolation Resistance	-	V_{IO} = 500Vdc	-	10^{11}	-	Ω
C_{ISO}	Isolation Capacitance	-	V_{IO} = 0, f =1MHz	-	0.2	-	pF

AC CHARACTERISTIC

Symbol	Characteristic	Device	Test Condition	Range			Unit
				Min	Typ	Max	
T_{on}	Turn on time	4N25, 4N26, 4N27, 4N28, H11A1, H11A2, H11A3, H11A4, H11A5	Vcc = 10V, Ic = 10mA, R_L = 100Ω	-	3	10	us
		4N35, 4N36, 4N37, 4N38	Vcc = 10V, Ic = 2mA, R_L = 100Ω	-	10	12	
T_{off}	Turn off time	4N25, 4N26, 4N27, 4N28 H11A1, H11A2, H11A3, H11A4 H11A5	Vcc = 10V, Ic = 10mA, R_L = 100Ω	-	3	10	us
		4N35, 4N36, 4N37, 4N38	Vcc = 10V, Ic = 10mA, R_L = 100Ω	-	9	12	

Characteristic Curves:

Figure 1. Forward Current vs Forward Voltage

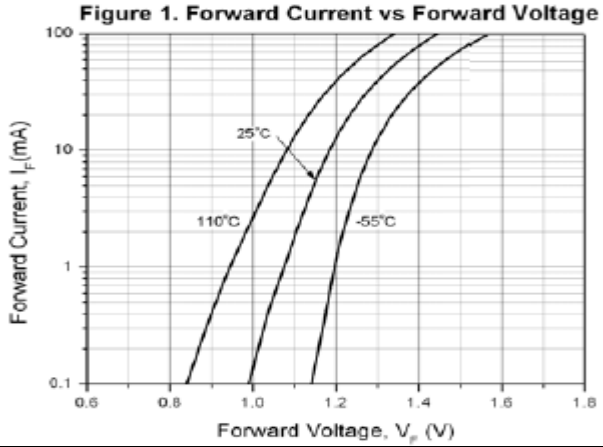


Figure 2. Current Tranfer Ratio vs Forward Current

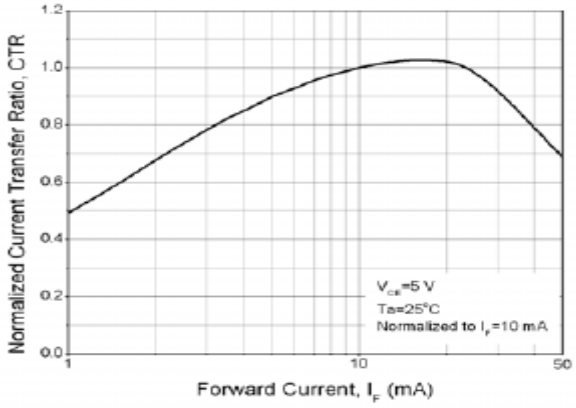


Figure 3. Current Tranfer Ratio vs Ambient Temperature

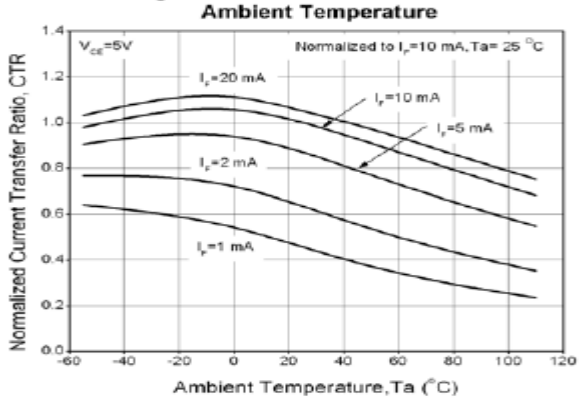


Figure 4. Current Transfer Ratio (Saturated) vs Base-Emitter Resistance

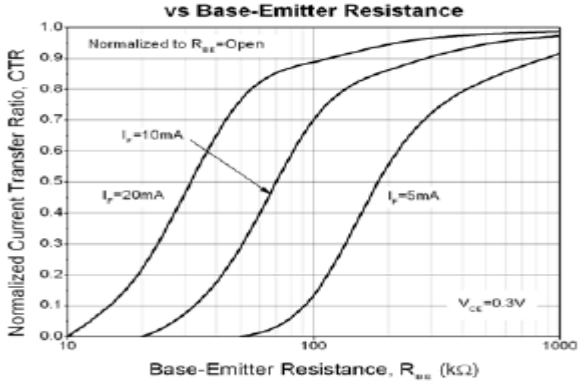


Figure 5. Current Transfer Ratio (Unsaturated) vs Base-Emitter Resistance

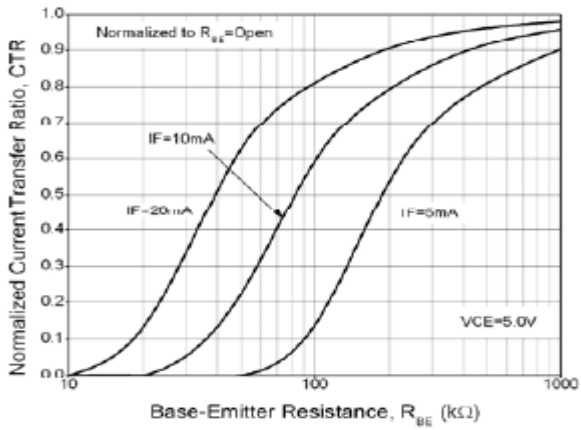


Figure 6. Dark Current vs Ambient Temperature

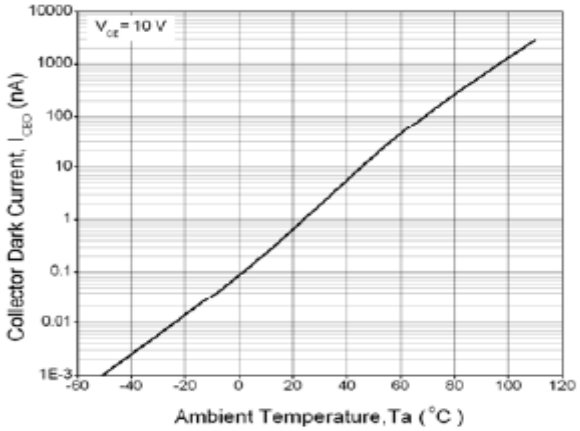


Figure 7. Collector-Emitter Saturation Voltage vs Collector Current

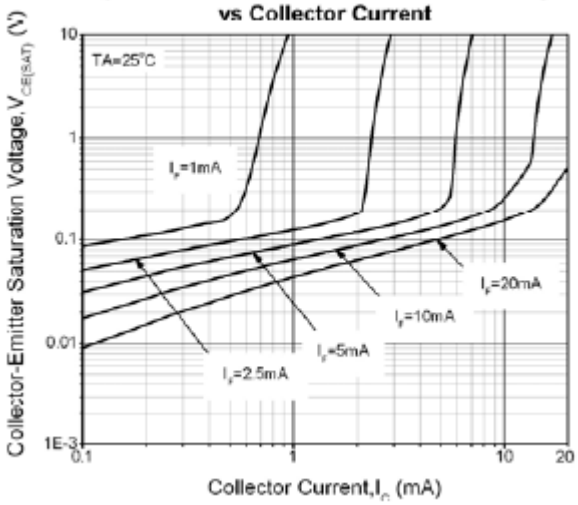


Figure 8. Switching Time vs Load Resistance

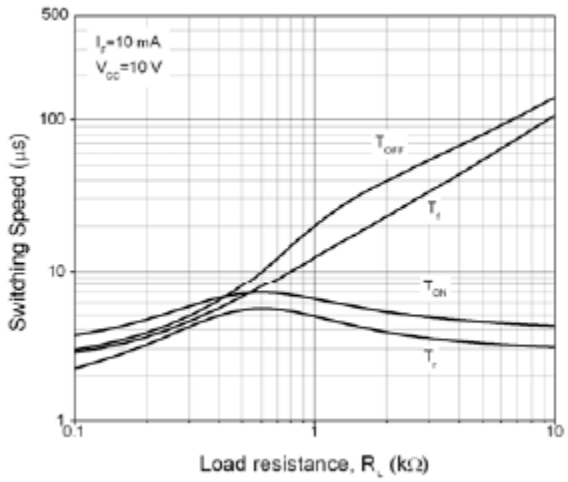


Figure 9. Turn-on Time vs Base-Emitter Resistance)

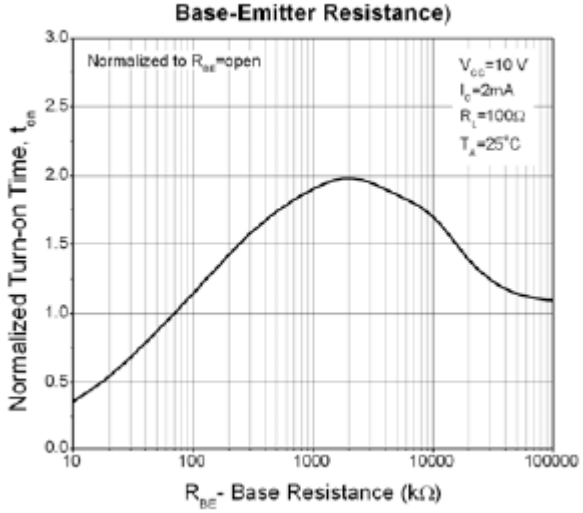
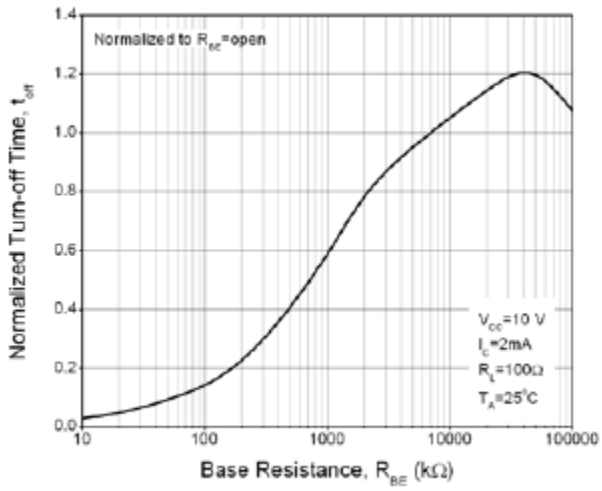


Figure 10. Turn-off Time vs Base-Emitter Resistance



Test Circuit for Response Time:

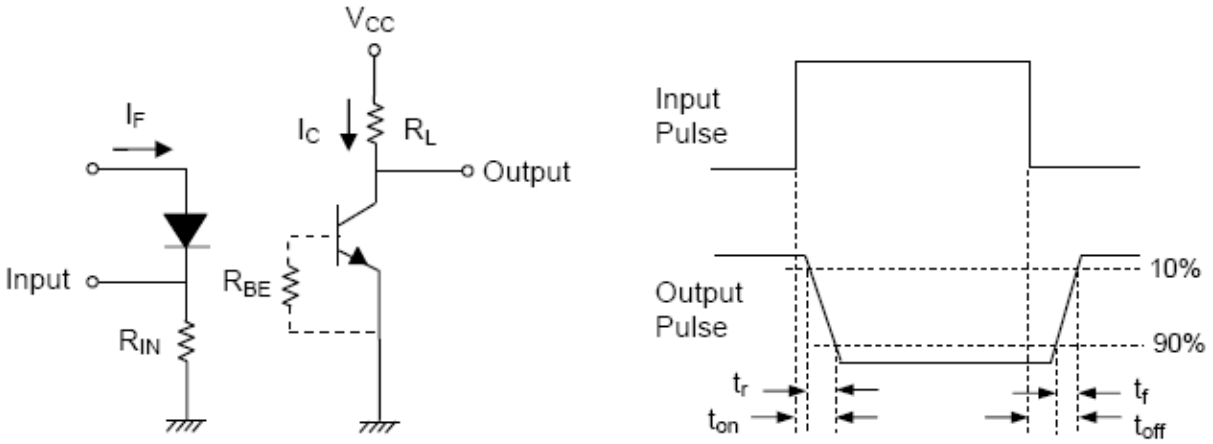
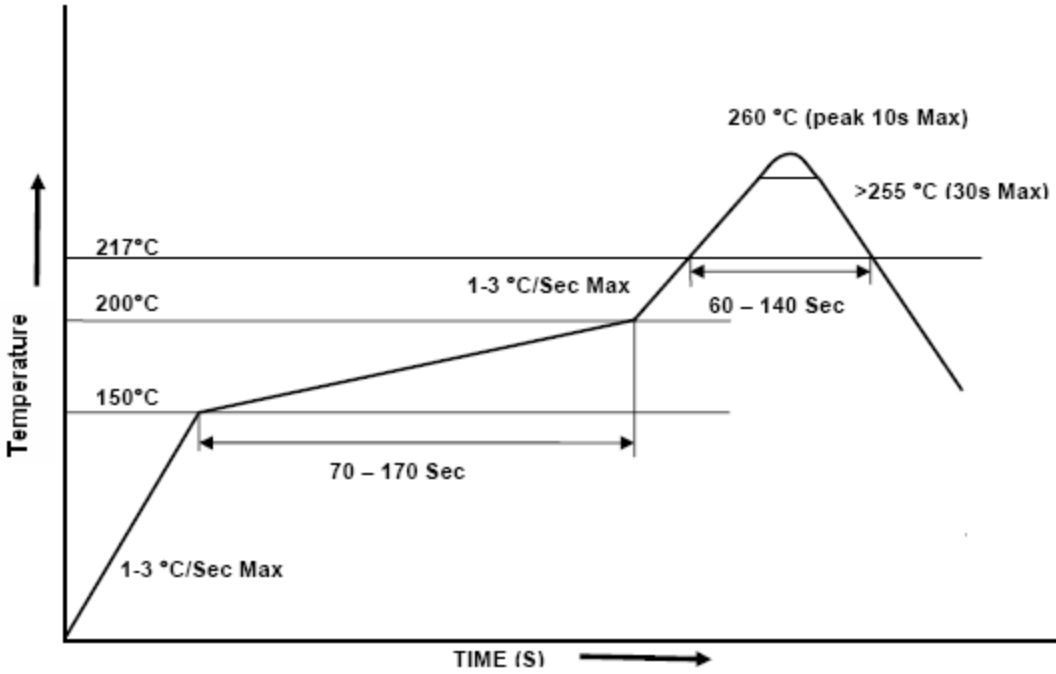
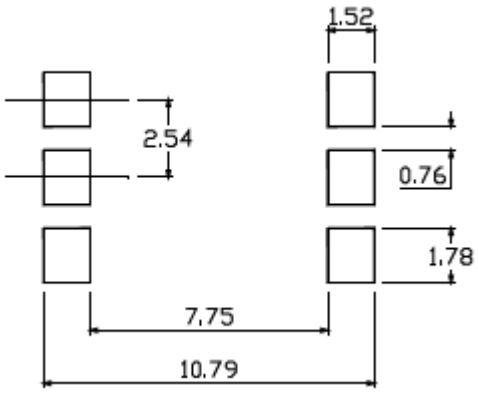


Figure 11. Switching Time Test Circuit & Waveforms

Solder Profile & Footprint:

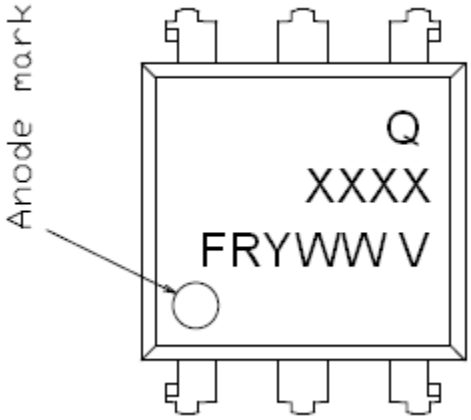




Recommended Solder Footprint for SMD Leadform

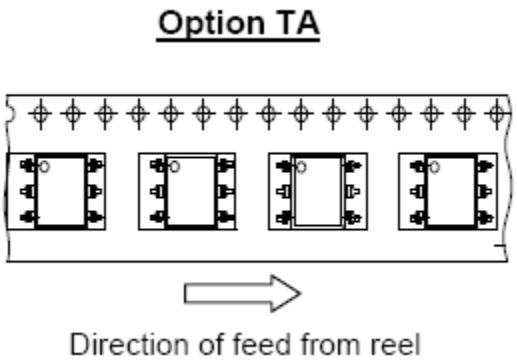
Units: mm tolerance: +/- 0.1mm

Device Marking:

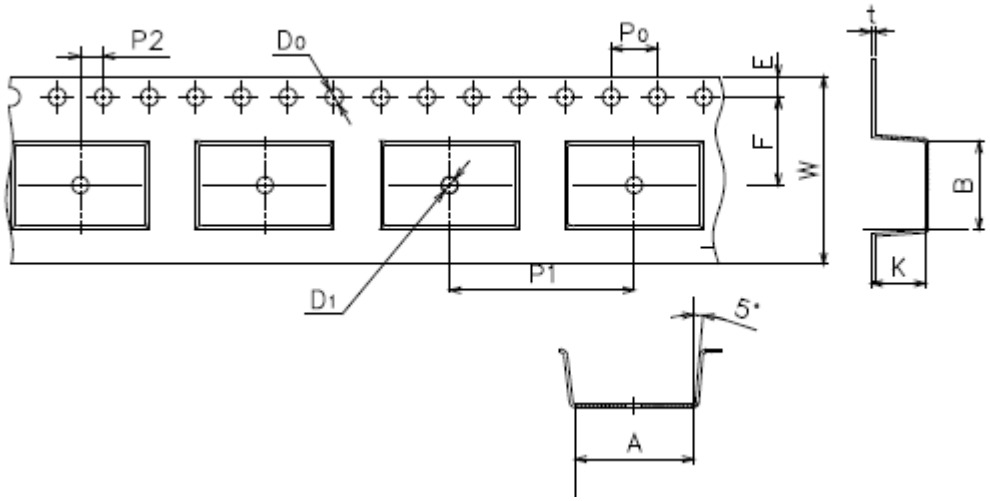


Q = QT-Brightek Corporation
XXXX = 4N25, 4N26, 4N27, 4N28, 4N35, 4N36, 4N37,
4N38, H11A1, H11A2, H11A3, H11A4, or H11A5
F = Country of Origin
R = Binning Option
Y = Year
WW = Week
V = VDE Option

Pack and Reel Specification:



Tape Dimension:



Dimension No.	A	B	Do	D1	E	F
Dimension (mm)	10.4±0.1	7.52±0.1	1.5±0.1	1.5+0.1/-0	1.75±0.1	7.5±0.1

Dimension No.	Po	P1	P2	t	W	K
Dimension (mm)	4.0±0.15	16.0±0.1	2.0±0.1	0.35±0.03	16.0±0.2	4.5±0.1

Ordering Information:

Part Number	Orderable Part Number	Options	Description	Quantity per packing
4N25	4N25	None	Standard tube package	60pcs / Tube
	4N25V	None	With VDE marking	60pcs / Tube
	4N25W	W	Wide lead bend (0.4 inch spacing)	60pcs / Tube
	4N25WV	W	Wide lead bend (0.4 inch spacing) + VDE marking	60pcs / Tube
	4N25STA	S	SMD lead form with tape and reel option	1000pcs / reel
	4N25STAV	S	SMD lead form with tape and reel option + VDE marking	1000pcs / reel
4N26	4N26	None	Standard tube package	60pcs / Tube
	4N26V	None	With VDE marking	60pcs / Tube
	4N26W	W	Wide lead bend (0.4 inch spacing)	60pcs / Tube
	4N26WV	W	Wide lead bend (0.4 inch spacing) + VDE marking	60pcs / Tube
	4N26STA	S	SMD lead form with tape and reel option	1000pcs / reel
	4N26STAV	S	SMD lead form with tape and reel option + VDE marking	1000pcs / reel
4N27	4N27	None	Standard tube package	60pcs / Tube
	4N27V	None	With VDE marking	60pcs / Tube
	4N27W	W	Wide lead bend (0.4 inch spacing)	60pcs / Tube
	4N27WV	W	Wide lead bend (0.4 inch spacing) + VDE marking	60pcs / Tube
	4N27STA	S	SMD lead form with tape and reel option	1000pcs / reel
	4N27STAV	S	SMD lead form with tape and reel option + VDE marking	1000pcs / reel

4N28	4N28	None	Standard tube package	60pcs / Tube
	4N28V	None	With VDE marking	60pcs / Tube
	4N28W	W	Wide lead bend (0.4 inch spacing)	60pcs / Tube
	4N28WV	W	Wide lead bend (0.4 inch spacing) + VDE marking	60pcs / Tube
	4N28STA	S	SMD lead form with tape and reel option	1000pcs / reel
	4N28STAV	S	SMD lead form with tape and reel option + VDE marking	1000pcs / reel
4N35	4N35	None	Standard tube package	60pcs / Tube
	4N35V	None	With VDE marking	60pcs / Tube
	4N35W	W	Wide lead bend (0.4 inch spacing)	60pcs / Tube
	4N35WV	W	Wide lead bend (0.4 inch spacing) + VDE marking	60pcs / Tube
	4N35STA	S	SMD lead form with tape and reel option	1000pcs / reel
	4N35STAV	S	SMD lead form with tape and reel option + VDE marking	1000pcs / reel
4N36	4N36	None	Standard tube package	60pcs / Tube
	4N36V	None	With VDE marking	60pcs / Tube
	4N36W	W	Wide lead bend (0.4 inch spacing)	60pcs / Tube
	4N36WV	W	Wide lead bend (0.4 inch spacing) + VDE marking	60pcs / Tube
	4N36STA	S	SMD lead form with tape and reel option	1000pcs / reel
	4N36STAV	S	SMD lead form with tape and reel option + VDE marking	1000pcs / reel

4N37	4N37	None	Standard tube package	60pcs / Tube
	4N37V	None	With VDE marking	60pcs / Tube
	4N37W	W	Wide lead bend (0.4 inch spacing)	60pcs / Tube
	4N37WV	W	Wide lead bend (0.4 inch spacing) + VDE marking	60pcs / Tube
	4N37STA	S	SMD lead form with tape and reel option	1000pcs / reel
	4N37STAV	S	SMD lead form with tape and reel option + VDE marking	1000pcs / reel
4N38	4N38	None	Standard tube package	60pcs / Tube
	4N38V	None	With VDE marking	60pcs / Tube
	4N38W	W	Wide lead bend (0.4 inch spacing)	60pcs / Tube
	4N38WV	W	Wide lead bend (0.4 inch spacing) + VDE marking	60pcs / Tube
	4N38STA	S	SMD lead form with tape and reel option	1000pcs / reel
	4N38STAV	S	SMD lead form with tape and reel option + VDE marking	1000pcs / reel
H11A1	H11A1	None	Standard tube package	60pcs / Tube
	H11A1V	None	With VDE marking	60pcs / Tube
	H11A1W	W	Wide lead bend (0.4 inch spacing)	60pcs / Tube
	H11A1WV	W	Wide lead bend (0.4 inch spacing) + VDE marking	60pcs / Tube
	H11A1STA	S	SMD lead form with tape and reel option	1000pcs / reel
	H11A1STAV	S	SMD lead form with tape and reel option + VDE marking	1000pcs / reel

H11A2	H11A2	None	Standard tube package	60pcs / Tube
	H11A2V	None	With VDE marking	60pcs / Tube
	H11A2W	W	Wide lead bend (0.4 inch spacking)	60pcs / Tube
	H11A2WV	W	Wide lead bend (0.4 inch spacking) + VDE marking	60pcs / Tube
	H11A2STA	S	SMD lead form with tape and reel option	1000pcs / reel
	H11A2STAV	S	SMD lead form with tape and reel option + VDE marking	1000pcs / reel
H11A3	H11A3	None	Standard tube package	60pcs / Tube
	H11A3V	None	With VDE marking	60pcs / Tube
	H11A3W	W	Wide lead bend (0.4 inch spacking)	60pcs / Tube
	H11A3WV	W	Wide lead bend (0.4 inch spacking) + VDE marking	60pcs / Tube
	H11A3STA	S	SMD lead form with tape and reel option	1000pcs / reel
	H11A3STAV	S	SMD lead form with tape and reel option + VDE marking	1000pcs / reel
H11A4	H11A4	None	Standard tube package	60pcs / Tube
	H11A4V	None	With VDE marking	60pcs / Tube
	H11A4W	W	Wide lead bend (0.4 inch spacking)	60pcs / Tube
	H11A4WV	W	Wide lead bend (0.4 inch spacking) + VDE marking	60pcs / Tube
	H11A4STA	S	SMD lead form with tape and reel option	1000pcs / reel
	H11A4STAV	S	SMD lead form with tape and reel option + VDE marking	1000pcs / reel

H11A5	H11A5	None	Standard tube package	60pcs / Tube
	H11A5V	None	With VDE marking	60pcs / Tube
	H11A5W	W	Wide lead bend (0.4 inch spacing)	60pcs / Tube
	H11A5WV	W	Wide lead bend (0.4 inch spacing) + VDE marking	60pcs / Tube
	H11A5STA	S	SMD lead form with tape and reel option	1000pcs / reel
	H11A5STAV	S	SMD lead form with tape and reel option + VDE marking	1000pcs / reel

Revision History:

Description:	Revision #	Revision Date
Initial release of 4N25, 4N26, 4N27, 4N28, 4N35, 4N36, 4N37, 4N38, H11A1, H11A2, H11A3, H11A4, H11A5 series	1.0	4/27/2010
Feature, certification & compliance and ordering information updates	1.1	02/01/2011

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1. Life support devices or systems are devices or systems which, (a) are intended for surgical implant into the body, or (b) support or sustain life, and (c) whose failure to perform when properly used in accordance with instructions for use provided in the labeling, can be reasonably expected to result in a significant injury of the user.

2. A critical component in any component of a life support device or system whose failure to perform can be reasonably expected to cause the failure of the life support device or system, or to affect its safety or effectiveness.