COMPLIANT

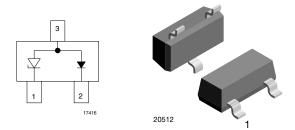
HALOGEN FREE

GREEN



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Low Capacitance ESD Protection Diodes for High-Speed Data Interfaces



MARKING (example only)



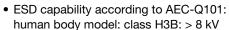
Bar = cathode marking YYY = type code (see table below) XX = date code

DESIGN SUPPORT TOOLS click logo to get started



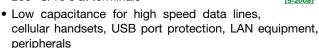
FEATURES

- IEC 61000-4-5 (lightning) see I_{PPM} below
- ESD immunity acc. IEC 61000-4-2
 ± 8 kV contact discharge
 - ± 15 kV air discharge





 High temperature soldering guaranteed: 260 °C/10 s at terminals



- e3 Sn
- AEC-Q101 qualified available
- Material categorization: for definitions of compliance please see www.vishay.com/doc?99912

ORDERING INFORMATION								
	ENVIR	ONMENTAL AN	ID QUALITY C	ODE	PACKAG	ING CODE		
(-)(()	AEC-Q101 QUALIFIED	LEAD (PD)-		TIN PLATED	3K PER 7" REEL (8 mm TAPE),	10K PER 13" REEL (8 mm TAPE),	ORDERING CODE (EXAMPLE)	
		STANDARD	GREEN	PLATED	15K/BOX = MOQ	10K/BOX = MOQ		
GL05T-		E		3	-08		GL05T-E3-08	
GL05T-			G	3	-08		GL05T-G3-08	
GL05T-	Н	Е		3	-08		GL05T-HE3-08	
GL05T-	Н		G	3	-08		GL05T-HG3-08	
GL05T-		Е		3		-18	GL05T-E3-18	
GL05T-			G	3		-18	GL05T-G3-18	
GL05T-	Н	E		3		-18	GL05T-HE3-18	
GL05T-	Н		G	3		-18	GL05T-HG3-18	

PACK	PACKAGE DATA							
DEVICE NAME	PACKAGE NAME	TYPE CODE	ENVIRONMENTAL STATUS	WEIGHT	MOLDING COMPOUND FLAMMABILITY RATING	MOISTURE SENSITIVITY LEVEL	SOLDERING CONDITIONS	
GL05T	SOT-23	L05	Standard	8.8 mg	UL 94 V-0	MSL level 1 (according J-STD-020)	260 °C/10 s at terminals	
GLOST	301-23	L06	Green	8.1 mg	UL 94 V-0	MSL level 1 (according J-STD-020)	260 °C/10 s at terminals	
GL12T	SOT-23	L12	Standard	8.8 mg	UL 94 V-0	MSL level 1 (according J-STD-020)	260 °C/10 s at terminals	
GLIZI	301-23	L13	Green	8.1 mg	UL 94 V-0	MSL level 1 (according J-STD-020)	260 °C/10 s at terminals	
GL15T	SOT-23	L15	Standard	8.8 mg	UL 94 V-0	MSL level 1 (according J-STD-020)	260 °C/10 s at terminals	
GLISI	301-23	L16	Green	8.1 mg	UL 94 V-0	MSL level 1 (according J-STD-020)	260 °C/10 s at terminals	
GL24T	SOT-23	L24	Standard	8.8 mg	UL 94 V-0	MSL level 1 (according J-STD-020)	260 °C/10 s at terminals	
GLZ41	301-23	L25	Green	8.1 mg	UL 94 V-0	MSL level 1 (according J-STD-020)	260 °C/10 s at terminals	

Rev. 2.2, 03-May-17 **1** Document Number: 85809 For technical questions, contact: <u>ESDprotection@vishav.com</u>



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ABSOLUTE MAXIMUM RATINGS GL05T							
PARAMETER	TEST	TEST CONDITIONS		VALUE	UNIT		
Peak pulse current	8/20 µs	Pin 1-2 (pin 3 n.c.)	I _{PPM}	25	Α		
Peak pulse power	8/20 µs waveform	Fill 1-2 (pill 3 ll.c.)	P _{PP}	300	W		
ESD immunity	Contact discharge	acc. IEC 61000-4-2; 10 pulses	V_{ESD}	± 8	kV		
ESD IIIIIIdility	Air discharge acc.	Air discharge acc. IEC 61000-4-2; 10 pulses		± 15	kV		
Blocking voltage	I _B = 1 μA	Pin 2-1 or pin 2-3	V _B	70	V		
Operating temperature	Junction temperatu	Junction temperature		-55 to +150	°C		
Storage temperature			T _{STG}	-55 to +150	°C		

ABSOLUTE MAXIMUM RATINGS GL12T							
PARAMETER	TEST	CONDITIONS	SYMBOL	VALUE	UNIT		
Peak pulse current	8/20 μs	Pin 1-2 (pin 3 n.c.)	I _{PPM}	12	Α		
Peak pulse power	8/20 µs waveform	ΡΙΙΙ 1-2 (ΡΙΙΙ 3 Π.C.)	P_PP	300	W		
EOD in a sil	Contact discharge	acc. IEC 61000-4-2; 10 pulses	V_{ESD}	± 8	kV		
ESD immunity	Air discharge acc. I	Air discharge acc. IEC 61000-4-2; 10 pulses		± 15	kV		
Blocking voltage	$I_B = 1 \mu A$	Pin 2-1 or pin 2-3	V_{B}	70	V		
Operating temperature	Junction temperatu	ire	T_J	-55 to +150	°C		
Storage temperature			T _{STG}	-55 to +150	°C		

ABSOLUTE MAXIMUM RATINGS GL15T							
PARAMETER	TEST	TEST CONDITIONS		VALUE	UNIT		
Peak pulse current	8/20 µs	Din 1 2 (nin 2 n a)	I _{PPM}	10	Α		
Peak pulse power	8/20 µs waveform	Pin 1-2 (pin 3 n.c.)	P _{PP}	300	W		
FOR in a sit	Contact discharge	acc. IEC 61000-4-2; 10 pulses	V_{ESD}	± 8	kV		
ESD immunity	Air discharge acc. I	Air discharge acc. IEC 61000-4-2; 10 pulses		± 15	kV		
Blocking voltage	$I_B = 1 \mu A$	Pin 2-1 or pin 2-3	V _B	70	V		
Operating temperature	Junction temperatu	re	T _J	-55 to +150	°C		
Storage temperature			T _{STG}	-55 to +150	°C		

ABSOLUTE MAXIMUM RATINGS GL24T							
PARAMETER	TEST	TEST CONDITIONS		VALUE	UNIT		
Peak pulse current	8/20 µs	Pin 1-2 (pin 3 n.c.)	I _{PPM}	5	Α		
Peak pulse power	8/20 µs waveform	ΕΠ 1-2 (βΠ 3 Π.Ε.)	P _{PP}	300	W		
ESD immunity	Contact discharge	acc. IEC 61000-4-2; 10 pulses	V_{ESD}	± 8	kV		
LSD initiality	Air discharge acc. I	Air discharge acc. IEC 61000-4-2; 10 pulses		± 15	kV		
Blocking voltage	I _B = 1 μA	Pin 2-1 or pin 2-3	V _B	70	V		
Operating temperature	Junction temperatu	re	TJ	-55 to +150	°C		
Storage temperature			T _{STG}	-55 to +150	°C		

The GLxxT contains an avalanche diode (pin 3-1) and a switching diode (pin 3-2). With pin 1 connected to the signal or data line and pin 2 connected to ground both diodes are in series (pin 3 remains unconnected). The big and robust avalanche diode, driven in reverse direction, provides the working range V_{RWM} of 5 V, 12 V, 15 V or 24 V. Due to its size the capacitance of the avalanche diode is in the range of typ. 260 pF (GL05T) and 65 pF (GL24T). The small switching diode in series has a low capacitance of just 2.5 pF (typ.). As both diodes are in series (with pin 3 not connected) the total capacitance of both diodes measured between pin 1 and 2 is as low as the capacitance of the switching diode.

Before the GLxxT can provide this low capacitance the big capacitance of the avalanche diode has to be charged up with the first signal or data pulses. This is usually no problem for digital signals like USB or other data ports.

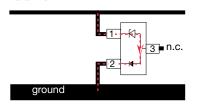
With the GLxxT a signal or data line can be protected against positive transients only. For negative transients another GLxxT can be used to provide a back path for the negative transients as well.



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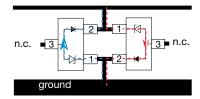
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Data line



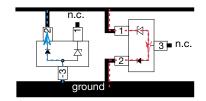
Uni Unidirectional clamping performance for positive transients only.

Data line



BiSy
Bidirectional and Symmetrical
clamping performance for positive
and negative transients.

Data line



BiAs
Bidirectional and Asymmetrical
clamping performance for positive
and negative transients.

ELECTRICAL CHARACTERISTICS GL05T (T _{amb} = 25 °C unless otherwise specified) pin 1 to pin 2; pin 3 not connected								
PARAMETER	TEST CONDITIONS/REMARKS	SYMBOL	MIN.	TYP.	MAX.	UNIT		
Protection paths	Number of lines which can be protected	N _{channel}	1	-	1	lines		
Reverse stand-off voltage	Max. reverse working voltage	V_{RWM}	-	-	5	V		
Reverse voltage	at I _R = 20 μA	V _R	5	-	-	V		
Reverse current	at V _R = 5 V	I _R	-	-	20	μΑ		
Reverse breakdown voltage	at I _R = 1 mA	V_{BR}	6.9	7.5	8.0	V		
Deverse elemning veltage	at I _{PP} = 1 A	V	-	-	9.8	V		
Reverse clamping voltage	at I _{PP} = 5 A	V _C	-	-	11	V		
Capacitance	at $V_B = 0 \text{ V}$; $f = 1 \text{ MHz}$	C _D	-	2.5	5	pF		

ELECTRICAL CHARACTERISTICS GL12T (T _{amb} = 25 °C unless otherwise specified) pin 1 to pin 2; pin 3 not connected								
PARAMETER	TEST CONDITIONS/REMARKS	SYMBOL	MIN.	TYP.	MAX.	UNIT		
Protection paths	Number of lines which can be protected	N _{channel}	-	-	1	lines		
Reverse stand-off voltage	Max. reverse working voltage	V_{RWM}	-	-	12	V		
Reverse voltage	at I _R = 1 μA	V_R	12	-	-	V		
Reverse current	at V _R = 12 V	I _R	-	-	1	μA		
Reverse breakdown voltage	at I _R = 1 mA	V_{BR}	13.3	14.3	17.2	V		
Poverse elemping veltage	at I _{PP} = 1 A		-	-	19	V		
Reverse clamping voltage	at I _{PP} = 5 A	V _C	-	-	24	V		
Capacitance	at V _R = 0 V; f = 1 MHz	C _D	-	2.5	5	pF		

pin 1 to pin 2; pin 3 not	ACTERISTICS GL15T (T _{amb} = 25 °C connected	unless othe	erwise spe	ecified)		
PARAMETER	TEST CONDITIONS/REMARKS	SYMBOL	MIN.	TYP.	MAX.	UNIT
Protection paths	Number of lines which can be protected	N _{channel}	-	-	1	lines
Reverse stand-off voltage	Max. reverse working voltage	V_{RWM}	-	-	15	V
Reverse voltage	at I _R = 1 μA	V _R	15	-	-	V
Reverse current	at V _R = 15 V	I _R	-	-	1	μA
Reverse breakdown voltage	at I _R = 1 mA	V_{BR}	16.7	17.7	22	V
Boyeres elemping voltage	at I _{PP} = 1 A	V	-	-	24	V
Reverse clamping voltage	at I _{PP} = 5 A	V _C	-	-	33	V
Capacitance	at $V_R = 0 V$; $f = 1 MHz$	C _D	ı	2.5	5	pF



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pin 1 to pin 2; pin 3 not	ACTERISTICS GL24T ($T_{amb} = 25 ^{\circ}\text{C}$ connected	unless othe	erwise spe	ecified)		
PARAMETER	TEST CONDITIONS/REMARKS	SYMBOL	MIN.	TYP.	MAX.	UNIT
Protection paths	Number of lines which can be protected	N _{channel}	-	-	1	lines
Reverse stand-off voltage	Max. reverse working voltage	V_{RWM}	-	-	24	V
Reverse voltage	at I _R = 1 μA	V _R	24	-	-	V
Reverse current	at V _R = 24 V	I _R	-	-	1	μΑ
Reverse breakdown voltage	at I _R = 1 mA	V_{BR}	26.7	28.2	33	V
Reverse clamping voltage	at I _{PP} = 1 A		-	-	43	V
neverse ciamping voitage	at I _{PP} = 5 A	V _C	-	-	55	V
Capacitance	at V _R = 0 V; f = 1 MHz	C _D	-	2.5	5	pF

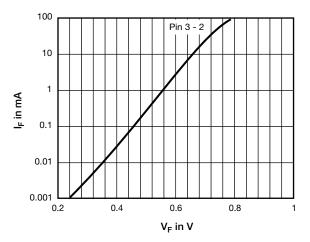


Fig. 1 - Typical Forward Current I_F vs. Forward Voltage V_F

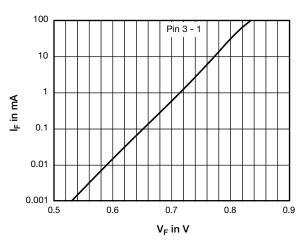


Fig. 2 - Typical Forward Current I_F vs. Forward Voltage V_F

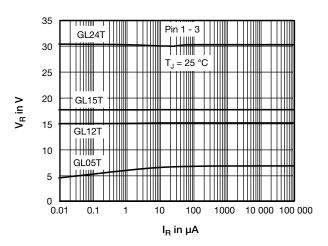


Fig. 3 - Typical Reverse Voltage V_{R} vs. Reverse Current I_{R}

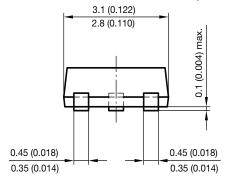


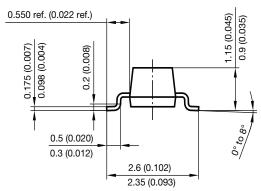
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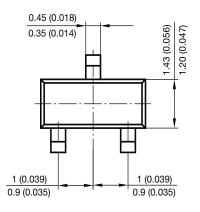
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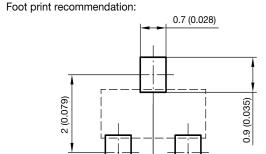
0.95 (0.037)

PACKAGE DIMENSIONS in millimeters (inches): SOT-23





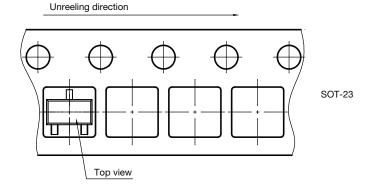




0.95 (0.037)

Document no.: 6.541-5014.01-4 Rev. 8 - Date: 23.Sept.2009

17418



Orientation in carrier tape SOT-23 S8-V-3929.01-006 (4) 04.02.2010 22607



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