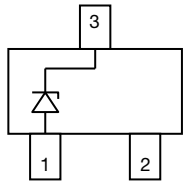
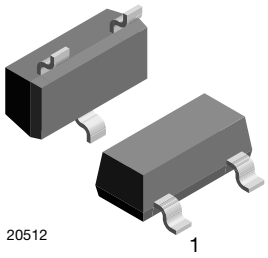
Single-Line ESD Protection Diode in SOT-23



20421



20512

1

FEATURES

- Single-line unidirectional ESD protection diode
- ESD immunity acc. IEC 61000-4-2 and ISO 10605
  ± 30 kV contact discharge
  ± 30 kV air discharge
- ESD capability according to AEC-Q101: human body model: class H3B: > 8 kV
- e3 - Sn
- AEC-Q101 qualified available
- Material categorization:
  for definitions of compliance please see www.vishay.com/doc?99912

AUTOMOTIVE GRADE Available

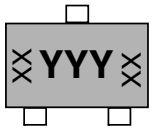
Pb-free

e3

RoHS COMPLIANT

HALOGEN FREE GREEN (5-2008)

MARKING (example only)



20357

YYY = type code (see table below)
XX = date code

LINKS TO ADDITIONAL RESOURCES

3D Models

SPICE Models

PRIMARY CHARACTERISTICS	
V_{BR}	4 V to 47 V
V_{RWM}	3.3 V to 36 V
P_{PPM} (8/20µs)	400 W to 540 W
P_{PPM} (10 x 1000µs)	44 W
ESD immunity (330 pF / 330 Ω)	± 30 kV
T_J max.	150 °C
Polarity	Unidirectional
Package	SOT-23
Circuit configuration	Single

ORDERING INFORMATION

PART NUMBER (EXAMPLE)	ENVIRONMENTAL AND QUALITY CODE			REVISION	PACKAGING CODE		ORDERING CODE (EXAMPLE)
	AEC-Q101 QUALIFIED	RoHS-COMPLIANT + LEAD (Pb)-FREE TERMINATIONS	TIN PLATED		3K PER 7" REEL (8 mm TAPE), 15K/BOX = MOQ	10K PER 13" REEL (8 mm TAPE), 10K/BOX = MOQ	
VGSOT05-		G	3	-	08		VGSOT05-G3-08
VGSOT05-	H	G	3	-	08		VGSOT05-HG3-08
VGSOT05-		G	3	-		18	VGSOT05-G3-18
VGSOT05-	H	G	3	-		18	VGSOT05-HG3-18

PACKAGE DATA							
DEVICE NAME	PACKAGE NAME	TYPE CODE	ENVIRONMENTAL STATUS	WEIGHT	MOLDING COMPOUND FLAMMABILITY RATING	MOISTURE SENSITIVITY LEVEL	SOLDERING CONDITIONS
VGSOT03	SOT-23	03H	Green	9.2 mg	UL 94 V-0	MSL level 1 (according J-STD-020)	Peak temperature max. 260 °C
VGSOT04	SOT-23	04H	Green	9.2 mg	UL 94 V-0	MSL level 1 (according J-STD-020)	Peak temperature max. 260 °C
VGSOT05	SOT-23	05H	Green	9.2 mg	UL 94 V-0	MSL level 1 (according J-STD-020)	Peak temperature max. 260 °C
VGSOT08	SOT-23	08H	Green	9.2 mg	UL 94 V-0	MSL level 1 (according J-STD-020)	Peak temperature max. 260 °C
VGSOT12	SOT-23	12H	Green	9.2 mg	UL 94 V-0	MSL level 1 (according J-STD-020)	Peak temperature max. 260 °C
VGSOT15	SOT-23	15H	Green	9.2 mg	UL 94 V-0	MSL level 1 (according J-STD-020)	Peak temperature max. 260 °C
VGSOT22	SOT-23	22H	Green	9.2 mg	UL 94 V-0	MSL level 1 (according J-STD-020)	Peak temperature max. 260 °C
VGSOT24	SOT-23	24H	Green	9.2 mg	UL 94 V-0	MSL level 1 (according J-STD-020)	Peak temperature max. 260 °C
VGSOT36	SOT-23	36H	Green	9.2 mg	UL 94 V-0	MSL level 1 (according J-STD-020)	Peak temperature max. 260 °C

ABSOLUTE MAXIMUM RATINGS VGSOT03 (T_{amb} = 25 °C unless otherwise specified)				
PARAMETER	TEST CONDITIONS	SYMBOL	VALUE	UNIT
Peak pulse current	t_p = 8/20 µs acc. IEC 61000-4-5; single shot	I_{PPM}	44	A
	t_p = 10/1000 µs; single shot		6	A
Peak pulse power	t_p = 8/20 µs acc. IEC 61000-4-5; single shot	P_{PP}	540	W
	t_p = 10/1000 µs; single shot		44	W
ESD immunity	Air and contact discharge acc. ISO 10605 (330 pF / 330 Ω); 10 pulses	V_{ESD}	± 30	kV
	Air and contact discharge acc. IEC 61000-4-2 (150 pF / 330 Ω); 10 pulses		± 30	kV
Operating temperature	Junction temperature	T_J	-55 to +150	°C
Storage temperature		T_{STG}	-55 to +150	°C

ABSOLUTE MAXIMUM RATINGS VGSOT04 (T_{amb} = 25 °C unless otherwise specified)				
PARAMETER	TEST CONDITIONS	SYMBOL	VALUE	UNIT
Peak pulse current	t_p = 8/20 µs acc. IEC 61000-4-5; single shot	I_{PPM}	40	A
	t_p = 10/1000 µs; single shot		5	A
Peak pulse power	t_p = 8/20 µs acc. IEC 61000-4-5; single shot	P_{PP}	540	W
	t_p = 10/1000 µs; single shot		44	W
ESD immunity	Air and contact discharge acc. ISO 10605 (330 pF / 330 Ω); 10 pulses	V_{ESD}	± 30	kV
	Air and contact discharge acc. IEC 61000-4-2 (150 pF / 330 Ω); 10 pulses		± 30	kV
Operating temperature	Junction temperature	T_J	-55 to +150	°C
Storage temperature		T_{STG}	-55 to +150	°C

ABSOLUTE MAXIMUM RATINGS VGSOT05 (T_{amb} = 25 °C unless otherwise specified)				
PARAMETER	**TEST CONDITIONS**	**SYMBOL**	**VALUE**	**UNIT**
Peak pulse current	t_p = 8/20 µs acc. IEC 61000-4-5; single shot	I_{PPM}	36	A
	t_p = 10/1000 µs; single shot		4	A
Peak pulse power	t_p = 8/20 µs acc. IEC 61000-4-5; single shot	P_{PP}	500	W
	t_p = 10/1000 µs; single shot		44	W
ESD immunity	Air and contact discharge acc. ISO 10605 (330 pF / 330 Ω); 10 pulses	V_{ESD}	± 30	kV
	Air and contact discharge acc. IEC 61000-4-2 (150 pF / 330 Ω); 10 pulses		± 30	kV
Operating temperature	Junction temperature	T_J	-55 to +150	°C
Storage temperature		T_{STG}	-55 to +150	°C

ABSOLUTE MAXIMUM RATINGS VGSOT08 (T_{amb} = 25 °C unless otherwise specified)				
PARAMETER	**TEST CONDITIONS**	**SYMBOL**	**VALUE**	**UNIT**
Peak pulse current	t_p = 8/20 µs acc. IEC 61000-4-5; single shot	I_{PPM}	28	A
	t_p = 10/1000 µs; single shot		3	A
Peak pulse power	t_p = 8/20 µs acc. IEC 61000-4-5; single shot	P_{PP}	500	W
	t_p = 10/1000 µs; single shot		44	W
ESD immunity	Air and contact discharge acc. ISO 10605 (330 pF / 330 Ω); 10 pulses	V_{ESD}	± 30	kV
	Air and contact discharge acc. IEC 61000-4-2 (150 pF / 330 Ω); 10 pulses		± 30	kV
Operating temperature	Junction temperature	T_J	-55 to +150	°C
Storage temperature		T_{STG}	-55 to +150	°C

ABSOLUTE MAXIMUM RATINGS VGSOT12 (T_{amb} = 25 °C unless otherwise specified)				
PARAMETER	**TEST CONDITIONS**	**SYMBOL**	**VALUE**	**UNIT**
Peak pulse current	t_p = 8/20 µs acc. IEC 61000-4-5; single shot	I_{PPM}	18.5	A
	t_p = 10/1000 µs; single shot		2	A
Peak pulse power	t_p = 8/20 µs acc. IEC 61000-4-5; single shot	P_{PP}	480	W
	t_p = 10/1000 µs; single shot		44	W
ESD immunity	Air and contact discharge acc. ISO 10605 (330 pF / 330 Ω); 10 pulses	V_{ESD}	± 30	kV
	Air and contact discharge acc. IEC 61000-4-2 (150 pF / 330 Ω); 10 pulses		± 30	kV
Operating temperature	Junction temperature	T_J	-55 to +150	°C
Storage temperature		T_{STG}	-55 to +150	°C

ABSOLUTE MAXIMUM RATINGS VGSOT15 (T_{amb} = 25 °C unless otherwise specified)				
PARAMETER	**TEST CONDITIONS**	**SYMBOL**	**VALUE**	**UNIT**
Peak pulse current	t_p = 8/20 µs acc. IEC 61000-4-5; single shot	I_{PPM}	15.5	A
	t_p = 10/1000 µs; single shot		1.6	A
Peak pulse power	t_p = 8/20 µs acc. IEC 61000-4-5; single shot	P_{PP}	450	W
	t_p = 10/1000 µs; single shot		44	W
ESD immunity	Air and contact discharge acc. ISO 10605 (330 pF / 330 Ω); 10 pulses	V_{ESD}	± 30	kV
	Air and contact discharge acc. IEC 61000-4-2 (150 pF / 330 Ω); 10 pulses		± 30	kV
Operating temperature	Junction temperature	T_J	-55 to +150	°C
Storage temperature		T_{STG}	-55 to +150	°C

ABSOLUTE MAXIMUM RATINGS VGSOT22 (T_{amb} = 25 °C unless otherwise specified)				
PARAMETER	**TEST CONDITIONS**	**SYMBOL**	**VALUE**	**UNIT**
Peak pulse current	t_p = 8/20 µs acc. IEC 61000-4-5; single shot	I_{PPM}	9.4	A
Peak pulse current	t_p = 10/1000 µs; single shot	I_{PPM}	1.1	A
Peak pulse power	t_p = 8/20 µs acc. IEC 61000-4-5; single shot	P_{PP}	400	W
Peak pulse power	t_p = 10/1000 µs; single shot	P_{PP}	44	W
ESD immunity	Air and contact discharge acc. ISO 10605 (330 pF / 330 Ω); 10 pulses	V_{ESD}	± 30	kV
	Air and contact discharge acc. IEC 61000-4-2 (150 pF / 330 Ω); 10 pulses		± 30	kV
Operating temperature	Junction temperature	T_J	-55 to +150	°C
Storage temperature		T_{STG}	-55 to +150	°C

ABSOLUTE MAXIMUM RATINGS VGSOT24 (T_{amb} = 25 °C unless otherwise specified)				
PARAMETER	**TEST CONDITIONS**	**SYMBOL**	**VALUE**	**UNIT**
Peak pulse current	t_p = 8/20 µs acc. IEC 61000-4-5; single shot	I_{PPM}	8.4	A
	t_p = 10/1000 µs; single shot		1	A
Peak pulse power	t_p = 8/20 µs acc. IEC 61000-4-5; single shot	P_{PP}	400	W
	t_p = 10/1000 µs; single shot		44	W
ESD immunity	Air and contact discharge acc. ISO 10605 (330 pF / 330 Ω); 10 pulses	V_{ESD}	± 30	kV
	Air and contact discharge acc. IEC 61000-4-2 (150 pF / 330 Ω); 10 pulses		± 30	kV
Operating temperature	Junction temperature	T_J	-55 to +150	°C
Storage temperature		T_{STG}	-55 to +150	°C

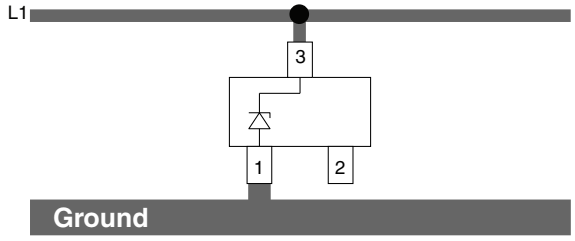
ABSOLUTE MAXIMUM RATINGS VGSOT36 (T_{amb} = 25 °C unless otherwise specified)				
PARAMETER	**TEST CONDITIONS**	**SYMBOL**	**VALUE**	**UNIT**
Peak pulse current	t_p = 8/20 µs acc. IEC 61000-4-5; single shot	I_{PPM}	5.6	A
	t_p = 10/1000 µs; single shot		0.7	A
Peak pulse power	t_p = 8/20 µs acc. IEC 61000-4-5; single shot	P_{PP}	400	W
	t_p = 10/1000 µs; single shot		44	W
ESD immunity	Air and contact discharge acc. ISO 10605 (330 pF / 330 Ω); 10 pulses	V_{ESD}	± 30	kV
	Air and contact discharge acc. IEC 61000-4-2 (150 pF / 330 Ω); 10 pulses		± 30	kV
Operating temperature	Junction temperature	T_J	-55 to +150	°C
Storage temperature		T_{STG}	-55 to +150	°C

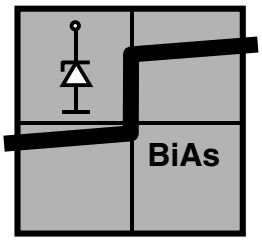
BiAs-MODE (1-line Bidirectional Asymmetrical protection mode)

With the VGSOTxx one signal- or data-lines (L1) can be protected against voltage transients. With pin 1 connected to ground and pin 3 connected to a signal- or data-line which has to be protected. As long as the voltage level on the data- or signal-line is between 0 V (ground level) and the specified maximum reverse working voltage (V_{RWM}) the protection diode between pin 1 and pin 3 offers a high isolation to the ground line. The protection device behaves like an open switch.

As soon as any positive transient voltage signal exceeds the breakdown voltage level of the protection diode, the diode becomes conductive and shorts the transient current to ground. Now the protection device behaves like a closed switch. The clamping voltage (V_C) is defined by the breakdown voltage (V_{BR}) level plus the voltage drop at the series impedance (resistance and inductance) of the protection diode.

Any negative transient signal will be clamped accordingly. The negative transient current is flowing in the forward direction through the protection diode. The low forward voltage (V_F) clamps the negative transient close to the ground level. Due to the different clamping levels in forward and reverse direction the VGSOTxx clamping behavior is Bidirectional and Asymmetrical (BiAs).





20422

ELECTRICAL CHARACTERISTICS VGSOT03 (T_{amb} = 25 °C unless otherwise specified)						
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}	-	-	3.3	V
Reverse voltage	At I_R = 100 µA	V_R	3.3	-	-	V
Reverse current	At V_R = 3.3 V	I_R	-	-	100	µA
Reverse breakdown voltage	At I_R = 1 mA	V_{BR}	4	4.6	5.5	V
Reverse clamping voltage	At I_{PP} = 1 A, t_p = 8/20 µs	V_C	-	5.7	7.5	V
	At I_{PP} = I_{PPM} = 44 A, t_p = 8/20 µs		-	9.2	12.3	V
Forward clamping voltage	At I_{PP} = 1 A, t_p = 8/20 µs	V_F	-	1	1.2	V
	At I_{PP} = I_{PPM} = 44 A, t_p = 8/20 µs		-	4.5	-	V
Capacitance	At V_R = 0 V; f = 1 MHz	C_D	-	460	600	pF
	At V_R = 1.6 V; f = 1 MHz		-	320	-	pF

ELECTRICAL CHARACTERISTICS VGSOT04 (T_{amb} = 25 °C unless otherwise specified)						
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}	-	-	4	V
Reverse voltage	At I_R = 20 µA	V_R	4	-	-	V
Reverse current	At V_R = 4 V	I_R	-	-	20	µA
Reverse breakdown voltage	At I_R = 1 mA	V_{BR}	5	6.1	7	V
Reverse clamping voltage	At I_{PP} = 1 A, t_p = 8/20 µs	V_C	-	6,5	8	V
	At I_{PP} = I_{PPM} = 40 A, t_p = 8/20 µs		-	10.3	13.5	V
Forward clamping voltage	At I_{PP} = 1 A, t_p = 8/20 µs	V_F	-	1	1.2	V
	At I_{PP} = I_{PPM} = 40 A, t_p = 8/20 µs		-	4.2	-	V
Capacitance	At V_R = 0 V; f = 1 MHz	C_D	-	360	450	pF
	At V_R = 2 V; f = 1 MHz		-	225	-	pF

ELECTRICAL CHARACTERISTICS VGSOT05 (T_{amb} = 25 °C unless otherwise specified)						
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}	-	-	5	V
Reverse voltage	At I_R = 10 µA	V_R	5	-	-	V
Reverse current	At V_R = 5 V	I_R	-	-	10	µA
Reverse breakdown voltage	At I_R = 1 mA	V_{BR}	6	6.8	8	V
Reverse clamping voltage	At I_{PP} = 1 A, t_p = 8/20 µs	V_C	-	7.3	8.7	V
	At I_{PP} = I_{PPM} = 36 A, t_p = 8/20 µs		-	11	14	V
Forward clamping voltage	At I_{PP} = 1 A, t_p = 8/20 µs	V_F	-	1	1.2	V
	At I_{PP} = I_{PPM} = 36 A, t_p = 8/20 µs		-	3.9	-	V
Capacitance	At V_R = 0 V; f = 1 MHz	C_D	-	279	350	pF
	At V_R = 2.5 V; f = 1 MHz		-	165	-	pF

ELECTRICAL CHARACTERISTICS VGSOT08 (T_{amb} = 25 °C unless otherwise specified)						
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}	-	-	8	V
Reverse voltage	At I_R = 5 µA	V_R	8	-	-	V
Reverse current	At V_R = 8 V	I_R	-	-	5	µA
Reverse breakdown voltage	At I_R = 1 mA	V_{BR}	9	10	11	V
Reverse clamping voltage	At I_{PP} = 1 A, t_p = 8/20 µs	V_C	-	10.7	13	V
	At I_{PP} = I_{PPM} = 28 A, t_p = 8/20 µs		-	14.4	18	V
Forward clamping voltage	At I_{PP} = 1 A, t_p = 8/20 µs	V_F	-	1	1.2	V
	At I_{PP} = I_{PPM} = 28 A, t_p = 8/20 µs		-	3.2	-	V
Capacitance	At V_R = 0 V; f = 1 MHz	C_D	-	175	250	pF
	At V_R = 4 V; f = 1 MHz		-	30	-	pF

ELECTRICAL CHARACTERISTICS VGSOT12 (T_{amb} = 25 °C unless otherwise specified)						
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}	13.5	15	16.5	V
Reverse clamping voltage	At I_{PP} = 1 A, t_p = 8/20 µs	V_C	-	15.4	18.7	V
	At I_{PP} = I_{PPM} = 18.5 A, t_p = 8/20 µs		-	20.2	26	V
Forward clamping voltage	At I_{PP} = 1 A, t_p = 8/20 µs	V_F	-	1	1.2	V
	At I_{PP} = I_{PPM} = 18.5 A, t_p = 8/20 µs		-	2.5	-	V
Capacitance	At V_R = 0 V; f = 1 MHz	C_D	-	115	150	pF
	At V_R = 6 V; f = 1 MHz		-	54	-	pF

ELECTRICAL CHARACTERISTICS VGSOT15 (T_{amb} = 25 °C unless otherwise specified)						
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}	16.5	18	20	V
Reverse clamping voltage	At I_{PP} = 1 A, t_p = 8/20 µs	V_C	-	18.5	22.5	V
	At I_{PP} = I_{PPM} = 15.5 A, t_p = 8/20 µs		-	23.5	28.8	V
Forward clamping voltage	At I_{PP} = 1 A, t_p = 8/20 µs	V_F	-	1	1.2	V
	At I_{PP} = I_{PPM} = 15.5 A, t_p = 8/20 µs		-	2.2	-	V
Capacitance	At V_R = 0 V; f = 1 MHz	C_D	-	100	120	pF
	At V_R = 7.5 V; f = 1 MHz		-	43	-	pF

ELECTRICAL CHARACTERISTICS VGSOT22 (T_{amb} = 25 °C unless otherwise specified)						
PARAMETER	**TEST CONDITIONS / REMARKS**	**SYMBOL**	**MIN.**	**TYP.**	**MAX.**	**UNIT**
Protection paths	Number of lines which can be protected	$N_{channel}$	-	-	2	lines
Reverse stand-off voltage	Max. reverse working voltage	V_{RWM}	-	-	22	V
Reverse voltage	At I_R = 1 µA	V_R	22	-	-	V
Reverse current	At V_R = 22 V	I_R	-	-	1	µA
Reverse breakdown voltage	At I_R = 1 mA	V_{BR}	25.1	27	28.8	V
Reverse clamping voltage	At I_{PP} = 1 A, t_p = 8/20 µs	V_C	-	28	32	V
	At I_{PP} = I_{PPM} = 9.4 A, t_p = 8/20 µs		-	34.5	41	V
Forward clamping voltage	At I_{PP} = 1 A, t_p = 8/20 µs	V_F	-	1	1.2	V
	At I_{PP} = I_{PPM} = 9.4 A, t_p = 8/20 µs		-	1.8	-	V
Capacitance	At V_R = 0 V; f = 1 MHz	C_D	-	70	85	pF
	At V_R = 11 V; f = 1 MHz		-	27	-	pF

ELECTRICAL CHARACTERISTICS VGSOT24 (T_{amb} = 25 °C unless otherwise specified)						
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	µA
Reverse breakdown voltage	at I_R = 1 mA	V_{BR}	27	30	33	V
Reverse clamping voltage	at I_{PP} = 1 A, t_p = 8/20 µs	V_C	-	31	37	V
	at I_{PP} = I_{PPM} = 8.4 A, t_p = 8/20 µs		-	37.5	46	V
Forward clamping voltage	at I_{PP} = 1 A, t_p = 8/20 µs	V_F	-	1	1.2	V
	at I_{PP} = I_{PPM} = 8.4 A, t_p = 8/20 µs		-	1.7	-	V
Capacitance	at V_R = 0 V; f = 1 MHz	C_D	-	65	80	pF
	at V_R = 12 V; f = 1 MHz		-	23	-	pF

ELECTRICAL CHARACTERISTICS VGSOT36 (T_{amb} = 25 °C unless otherwise specified)						
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}	-	-	36	V
Reverse voltage	At I_R = 1 µA	V_R	36	-	-	V
Reverse current	At V_R = 36 V	I_R	-	-	1	µA
Reverse breakdown voltage	At I_R = 1 mA	V_{BR}	39	43	47	V
Reverse clamping voltage	At I_{PP} = 1 A, t_p = 8/20 µs	V_C	-	45	60	V
	At I_{PP} = I_{PPM} = 5.6 A, t_p = 8/20 µs		-	52	71	V
Forward clamping voltage	At I_{PP} = 1 A, t_p = 8/20 µs	V_F	-	1	1.2	V
	At I_{PP} = I_{PPM} = 5.6 A, t_p = 8/20 µs		-	1.4	-	V
Capacitance	At V_R = 0 V; f = 1 MHz	C_D	-	45	65	pF
	At V_R = 18 V; f = 1 MHz		-	14	-	pF

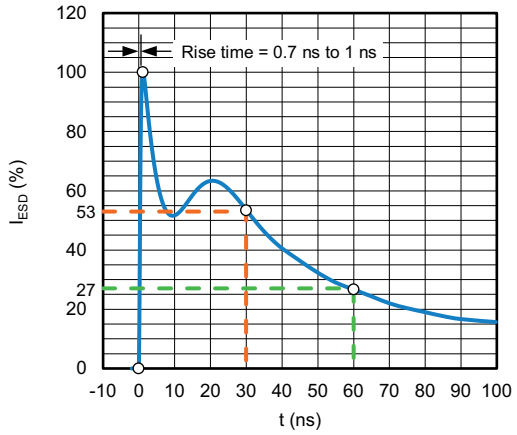


Fig. 1 - ESD Discharge Current Waveform
According to IEC 61000-4-2 (330 Ω / 150 pF)

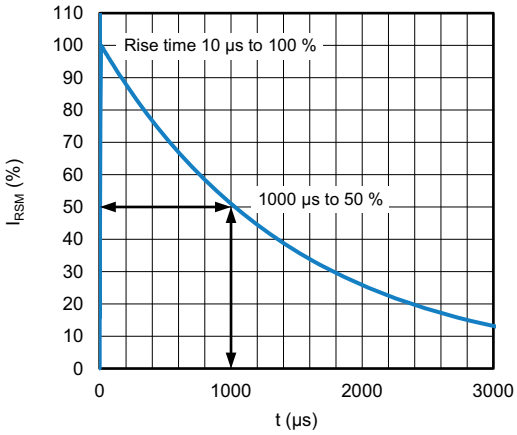


Fig. 3 - 10/1000 µs Peak Pulse Current Wave Form

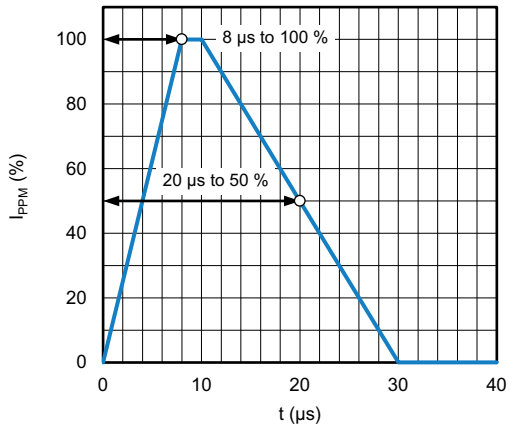


Fig. 2 - 8/20 µs Peak Pulse Current Waveform
According to IEC 61000-4-5

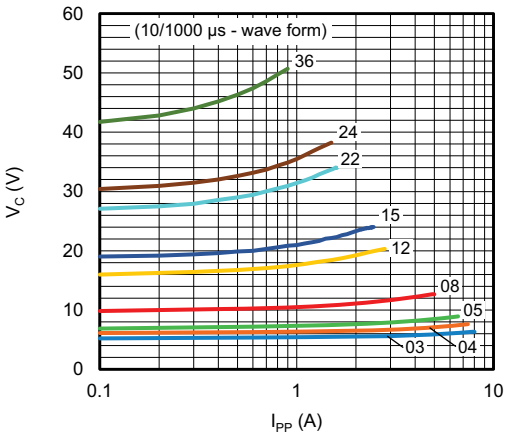


Fig. 4 - Typical Peak Clamping Voltage vs. Peak Pulse Current

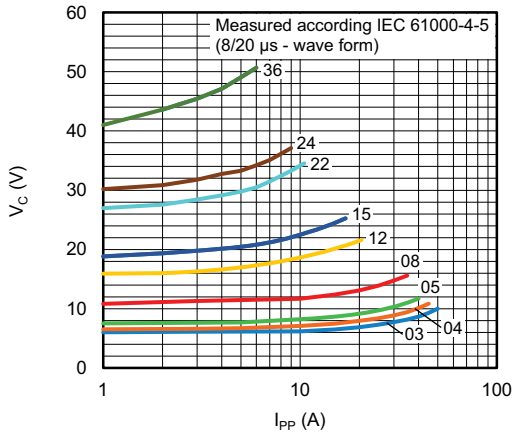


Fig. 5 - Typical Peak Clamping Voltage vs. Peak Pulse Current

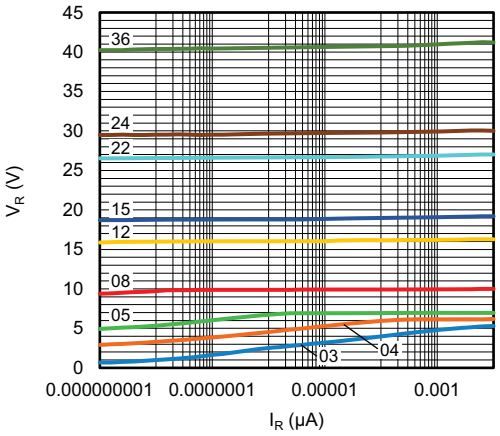


Fig. 8 - Typical Reverse Voltage vs. Reverse Current

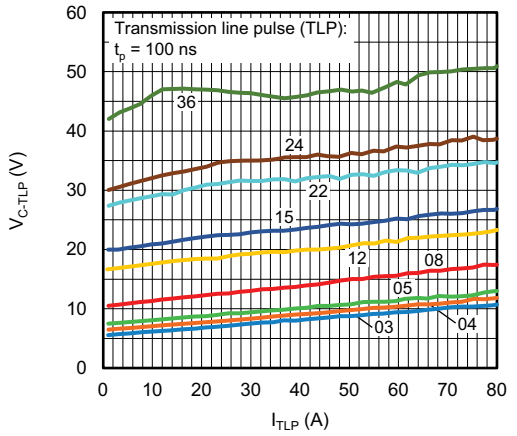


Fig. 6 - Typical Clamping Voltage vs. Peak Pulse Current

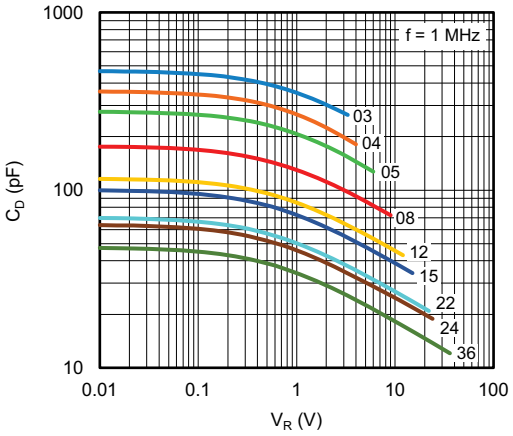


Fig. 9 - Typical Capacitance vs. Reverse Voltage

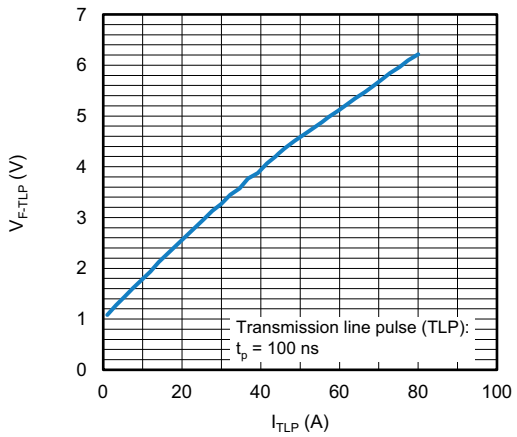


Fig. 7 - Typical Forward Voltage vs. Peak Pulse Current

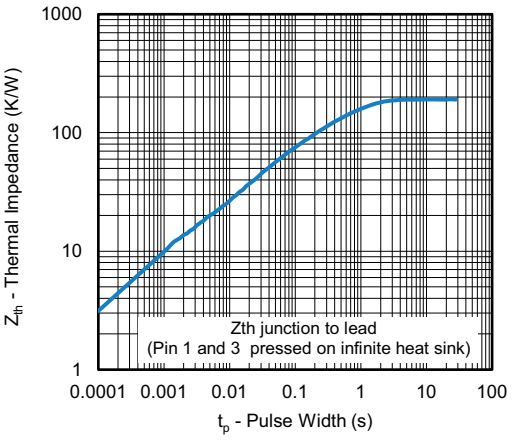
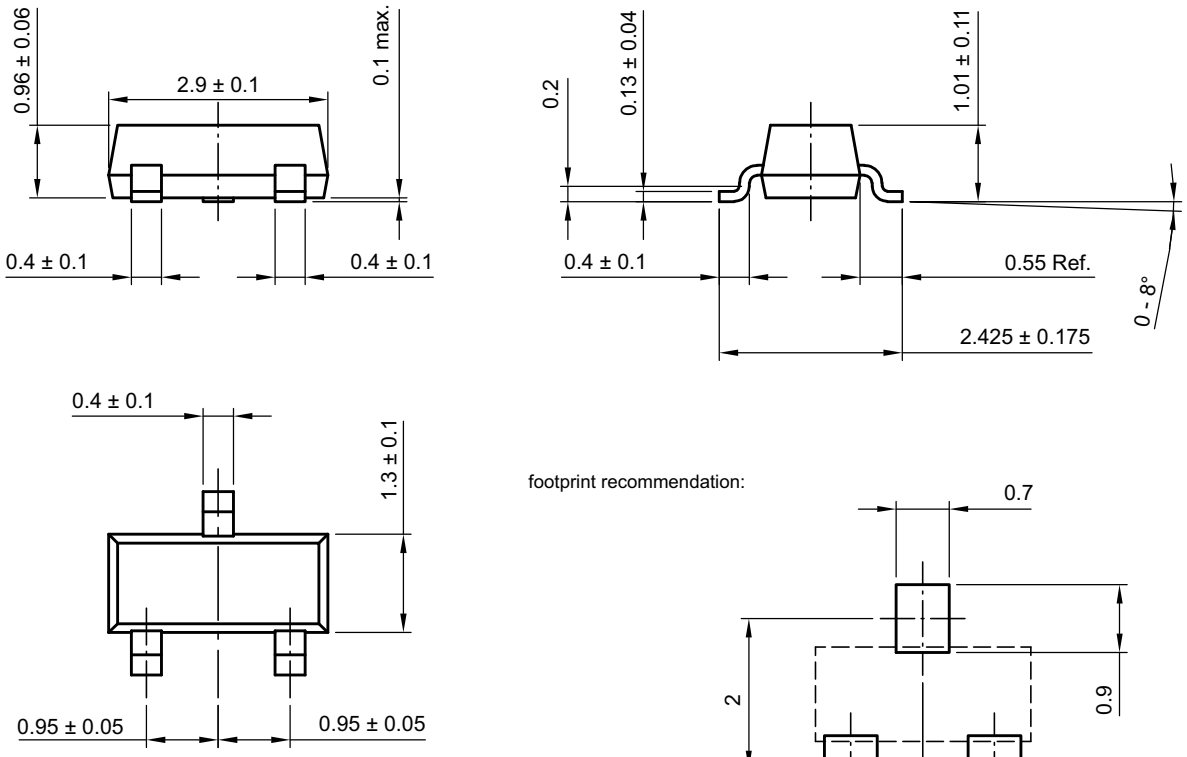
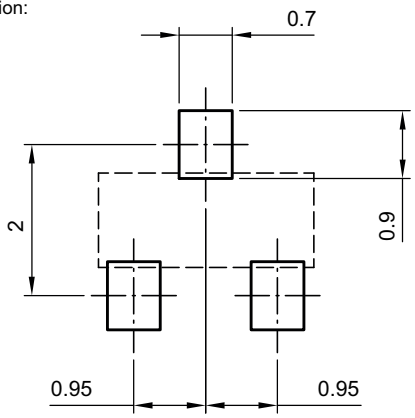


Fig. 10 - Thermal Impedance vs. Time

PACKAGE DIMENSIONS in millimeters (inches): **SOT-23**



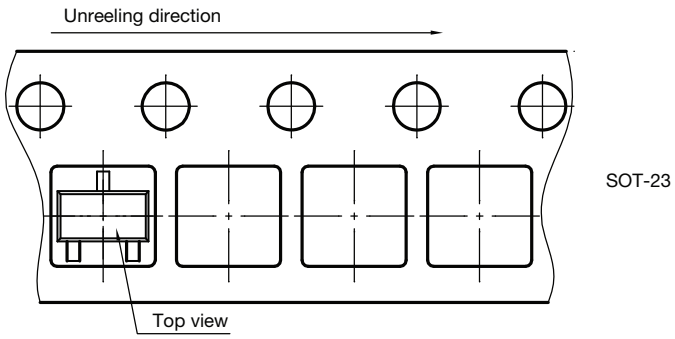
footprint recommendation:



Document no.: S8-V-3929.01-009 (4)
Created - Date: 18 Oct. 2021
Rev. 01 - Date: 18 Jan. 2022

23193

ORIENTATION IN CARRIER TAPE SOT-23



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

Disclaimer

ALL PRODUCT, PRODUCT SPECIFICATIONS AND DATA ARE SUBJECT TO CHANGE WITHOUT NOTICE TO IMPROVE RELIABILITY, FUNCTION OR DESIGN OR OTHERWISE.

Vishay Intertechnology, Inc., its affiliates, agents, and employees, and all persons acting on its or their behalf (collectively, “Vishay”), disclaim any and all liability for any errors, inaccuracies or incompleteness contained in any datasheet or in any other disclosure relating to any product.

Vishay makes no warranty, representation or guarantee regarding the suitability of the products for any particular purpose or the continuing production of any product. To the maximum extent permitted by applicable law, Vishay disclaims (i) any and all liability arising out of the application or use of any product, (ii) any and all liability, including without limitation special, consequential or incidental damages, and (iii) any and all implied warranties, including warranties of fitness for particular purpose, non-infringement and merchantability.

Statements regarding the suitability of products for certain types of applications are based on Vishay's knowledge of typical requirements that are often placed on Vishay products in generic applications. Such statements are not binding statements about the suitability of products for a particular application. It is the customer's responsibility to validate that a particular product with the properties described in the product specification is suitable for use in a particular application. Parameters provided in datasheets and / or specifications may vary in different applications and performance may vary over time. All operating parameters, including typical parameters, must be validated for each customer application by the customer's technical experts. Product specifications do not expand or otherwise modify Vishay's terms and conditions of purchase, including but not limited to the warranty expressed therein.

Hyperlinks included in this datasheet may direct users to third-party websites. These links are provided as a convenience and for informational purposes only. Inclusion of these hyperlinks does not constitute an endorsement or an approval by Vishay of any of the products, services or opinions of the corporation, organization or individual associated with the third-party website. Vishay disclaims any and all liability and bears no responsibility for the accuracy, legality or content of the third-party website or for that of subsequent links.

Vishay products are not designed for use in life-saving or life-sustaining applications or any application in which the failure of the Vishay product could result in personal injury or death unless specifically qualified in writing by Vishay. Customers using or selling Vishay products not expressly indicated for use in such applications do so at their own risk. Please contact authorized Vishay personnel to obtain written terms and conditions regarding products designed for such applications.

No license, express or implied, by estoppel or otherwise, to any intellectual property rights is granted by this document or by any conduct of Vishay. Product names and markings noted herein may be trademarks of their respective owners.