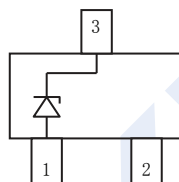
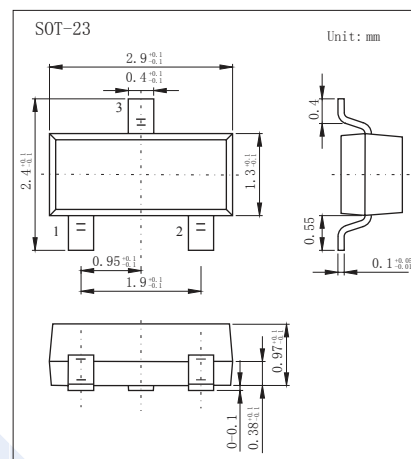


ESD Protection Diodes

GSOT03 ~ GSOT36

■ Features

- Single-line ESD-protection device
- ESD-protection acc. IEC 61000-4-2
 - ± 30 kV contact discharge
 - ± 30 kV air discharge
- ESD capability according to AEC-Q101:
 - human body model: class H3B: > 8 kV
- Space saving SOT-23 package



■ Absolute Maximum Ratings GSOT03

Parameter	Test Conditions	Symbol	Value	Unit
Peak pulse current	Pin 3 to 1 acc. IEC 61000-4-5, $t_p = 8/20 \mu s$; single shot	I_{PPM}	30	A
Peak pulse power	Pin 3 to 1 acc. IEC 61000-4-5, $t_p = 8/20 \mu s$; single shot	P_{PP}	369	W
ESD immunity	Contact discharge acc. IEC 61000-4-2; 10 pulses	V_{ESD}	± 30	kV
	Air discharge acc. IEC 61000-4-2; 10 pulses		± 30	
Operating temperature	Junction temperature	T_j	-40 to +125	°C
Storage temperature		T_{stg}	-55 to +150	

■ Absolute Maximum Ratings GSOT04

Parameter	Test Conditions	Symbol	Value	Unit
Peak pulse current	Pin 3 to 1 acc. IEC 61000-4-5, $t_p = 8/20 \mu s$; single shot	I_{PPM}	30	A
Peak pulse power	Pin 3 to 1 acc. IEC 61000-4-5, $t_p = 8/20 \mu s$; single shot	P_{PP}	429	W
ESD immunity	Contact discharge acc. IEC 61000-4-2; 10 pulses	V_{ESD}	± 30	kV
	Air discharge acc. IEC 61000-4-2; 10 pulses		± 30	
Operating temperature	Junction temperature	T_j	-40 to +125	°C
Storage temperature		T_{stg}	-55 to +150	

ESD Protection Diodes

GSOT03 ~ GSOT36

■ Absolute Maximum Ratings GSOT05

Parameter	Test Conditions	Symbol	Value	Unit
Peak pulse current	Pin 3 to 1 acc. IEC 61000-4-5, $t_p = 8/20 \mu s$; single shot	I _{PPM}	30	A
Peak pulse power	Pin 3 to 1 acc. IEC 61000-4-5, $t_p = 8/20 \mu s$; single shot	P _{PP}	480	W
ESD immunity	Contact discharge acc. IEC 61000-4-2; 10 pulses	V _{ESD}	± 30	kV
	Air discharge acc. IEC 61000-4-2; 10 pulses		± 30	
Operating temperature	Junction temperature	T _j	-40 to +125	°C
Storage temperature		T _{stg}	-55 to +150	

■ Absolute Maximum Ratings GSOT08

Parameter	Test Conditions	Symbol	Value	Unit
Peak pulse current	Pin 3 to 1 acc. IEC 61000-4-5, $t_p = 8/20 \mu s$; single shot	I _{PPM}	18	A
Peak pulse power	Pin 3 to 1 acc. IEC 61000-4-5, $t_p = 8/20 \mu s$; single shot	P _{PP}	345	W
ESD immunity	Contact discharge acc. IEC 61000-4-2; 10 pulses	V _{ESD}	± 30	kV
	Air discharge acc. IEC 61000-4-2; 10 pulses		± 30	
Operating temperature	Junction temperature	T _j	-40 to +125	°C
Storage temperature		T _{stg}	-55 to +150	

■ Absolute Maximum Ratings GSOT12

Parameter	Test Conditions	Symbol	Value	Unit
Peak pulse current	Pin 3 to 1 acc. IEC 61000-4-5, $t_p = 8/20 \mu s$; single shot	I _{PPM}	12	A
Peak pulse power	Pin 3 to 1 acc. IEC 61000-4-5, $t_p = 8/20 \mu s$; single shot	P _{PP}	312	W
ESD immunity	Contact discharge acc. IEC 61000-4-2; 10 pulses	V _{ESD}	± 30	kV
	Air discharge acc. IEC 61000-4-2; 10 pulses		± 30	
Operating temperature	Junction temperature	T _j	-40 to +125	°C
Storage temperature		T _{stg}	-55 to +150	

■ Absolute Maximum Ratings GSOT15

Parameter	Test Conditions	Symbol	Value	Unit
Peak pulse current	Pin 3 to 1 acc. IEC 61000-4-5, $t_p = 8/20 \mu s$; single shot	I _{PPM}	8	A
Peak pulse power	Pin 3 to 1 acc. IEC 61000-4-5, $t_p = 8/20 \mu s$; single shot	P _{PP}	230	W
ESD immunity	Contact discharge acc. IEC 61000-4-2; 10 pulses	V _{ESD}	± 30	kV
	Air discharge acc. IEC 61000-4-2; 10 pulses		± 30	
Operating temperature	Junction temperature	T _j	-40 to +125	°C
Storage temperature		T _{stg}	-55 to +150	

ESD Protection Diodes

GSOT03 ~ GSOT36

■ Absolute Maximum Ratings GSOT24

Parameter	Test Conditions	Symbol	Value	Unit
Peak pulse current	Pin 3 to 1 acc. IEC 61000-4-5, $t_p = 8/20 \mu s$; single shot	I _{PPM}	5	A
Peak pulse power	Pin 3 to 1 acc. IEC 61000-4-5, $t_p = 8/20 \mu s$; single shot	P _{PP}	235	W
ESD immunity	Contact discharge acc. IEC 61000-4-2; 10 pulses	V _{ESD}	± 30	kV
	Air discharge acc. IEC 61000-4-2; 10 pulses		± 30	
Operating temperature	Junction temperature	T _j	-40 to +125	°C
Storage temperature		T _{stg}	-55 to +150	

■ Absolute Maximum Ratings GSOT36

Parameter	Test Conditions	Symbol	Value	Unit
Peak pulse current	Pin 3 to 1 acc. IEC 61000-4-5, $t_p = 8/20 \mu s$; single shot	I _{PPM}	3.5	A
Peak pulse power	Pin 3 to 1 acc. IEC 61000-4-5, $t_p = 8/20 \mu s$; single shot	P _{PP}	248	W
ESD immunity	Contact discharge acc. IEC 61000-4-2; 10 pulses	V _{ESD}	± 30	kV
	Air discharge acc. IEC 61000-4-2; 10 pulses		± 30	
Operating temperature	Junction temperature	T _j	-40 to +125	°C
Storage temperature		T _{stg}	-55 to +150	

■ Electrical Characteristics GSOT03 (T_{amb} = 25 °C unless otherwise specified)
between pin 3 and pin 1

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Protection paths	N _{channel}	Number of lines which can be protected			1	lines
Reverse stand-off voltage	V _{RWM}	Max. reverse working voltage			3.3	V
Reverse voltage	V _R	at I _R = 100 μA	3.3			
Reverse current	I _R	at V _R = 3.3 V			100	μA
Reverse breakdown voltage	V _{BR}	at I _R = 1 mA	4	4.6	5.5	V
Reverse clamping voltage	V _C	at I _{PP} = 1 A		5.7	7.5	
		at I _{PP} = I _{PPM} = 30 A		10	12.3	
Forward clamping voltage	V _F	at I _{PP} = 1 A		1	1.2	
		at I _{PP} = I _{PPM} = 30 A		4.5		
Capacitance	C _D	at V _R = 0 V; f = 1 MHz		420	600	pF
		at V _R = 1.6 V; f = 1 MHz		260		

ESD Protection Diodes

GSOT03 ~ GSOT36

■ Electrical Characteristics GSOT04 ($T_{amb} = 25\text{ }^{\circ}\text{C}$ unless otherwise specified)
between pin 3 and pin 1

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Protection paths	Nchannel	Number of lines which can be protected			1	lines
Reverse stand-off voltage	V_{RWM}	Max. reverse working voltage			4	V
Reverse voltage	V_R	at $I_R = 20\text{ }\mu\text{A}$	4			
Reverse current	I_R	at $V_R = 4\text{ V}$			20	μA
Reverse breakdown voltage	V_{BR}	at $I_R = 1\text{ mA}$	5	6.1	7	V
Reverse clamping voltage	V_C	at $I_{PP} = 1\text{ A}$		7.5	9	
		at $I_{PP} = I_{PPM} = 30\text{ A}$		11.2	14.3	
Forward clamping voltage	V_F	at $I_{PP} = 1\text{ A}$		1	1.2	
		at $I_{PP} = I_{PPM} = 30\text{ A}$		4.5		
Capacitance	C_D	at $V_R = 0\text{ V}$; $f = 1\text{ MHz}$		310	450	pF
		at $V_R = 2\text{ V}$; $f = 1\text{ MHz}$		200		

■ Electrical Characteristics GSOT05 ($T_{amb} = 25\text{ }^{\circ}\text{C}$ unless otherwise specified)
between pin 3 and pin 1

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Protection paths	Nchannel	Number of lines which can be protected			1	lines
Reverse stand-off voltage	V_{RWM}	Max. reverse working voltage			5	V
Reverse voltage	V_R	at $I_R = 10\text{ }\mu\text{A}$	5			
Reverse current	I_R	at $V_R = 5\text{ V}$			10	μA
Reverse breakdown voltage	V_{BR}	at $I_R = 1\text{ mA}$	6	6.8	8	V
Reverse clamping voltage	V_C	at $I_{PP} = 1\text{ A}$		7	8.7	
		at $I_{PP} = I_{PPM} = 30\text{ A}$		12	16	
Forward clamping voltage	V_F	at $I_{PP} = 1\text{ A}$		1	1.2	
		at $I_{PP} = I_{PPM} = 30\text{ A}$		4.5		
Capacitance	C_D	at $V_R = 0\text{ V}$; $f = 1\text{ MHz}$		260	350	pF
		at $V_R = 2.5\text{ V}$; $f = 1\text{ MHz}$		150		

■ Electrical Characteristics GSOT08 ($T_{amb} = 25\text{ }^{\circ}\text{C}$ unless otherwise specified)
between pin 3 and pin 1

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Protection paths	Nchannel	Number of lines which can be protected			1	lines
Reverse stand-off voltage	V_{RWM}	Max. reverse working voltage			8	V
Reverse voltage	V_R	at $I_R = 5\text{ }\mu\text{A}$	8			
Reverse current	I_R	at $V_R = 8\text{ V}$			5	μA
Reverse breakdown voltage	V_{BR}	at $I_R = 1\text{ mA}$	9	10	11	V
Reverse clamping voltage	V_C	at $I_{PP} = 1\text{ A}$		10.7	13	
		at $I_{PP} = I_{PPM} = 18\text{ A}$		15.2	19.2	
Forward clamping voltage	V_F	at $I_{PP} = 1\text{ A}$		1	1.2	
		at $I_{PP} = I_{PPM} = 18\text{ A}$		3		
Capacitance	C_D	at $V_R = 0\text{ V}$; $f = 1\text{ MHz}$		160	250	pF
		at $V_R = 4\text{ V}$; $f = 1\text{ MHz}$		80		

ESD Protection Diodes

GSOT03 ~ GSOT36

■ Electrical Characteristics GSOT12 ($T_{amb} = 25\text{ }^{\circ}\text{C}$ unless otherwise specified)
between pin 3 and pin 1

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Protection paths	Nchannel	Number of lines which can be protected			1	lines
Reverse stand-off voltage	V_{RWM}	Max. reverse working voltage			12	V
Reverse voltage	V_R	at $I_R = 1\text{ }\mu\text{A}$	12			
Reverse current	I_R	at $V_R = 12\text{ V}$			1	μA
Reverse breakdown voltage	V_{BR}	at $I_R = 1\text{ mA}$	13.5	15	16.5	V
Reverse clamping voltage	V_C	at $I_{PP} = 1\text{ A}$		15.4	18.7	
		at $I_{PP} = I_{PPM} = 12\text{ A}$		21.2	26	
Forward clamping voltage	V_F	at $I_{PP} = 1\text{ A}$		1	1.2	
		at $I_{PP} = I_{PPM} = 12\text{ A}$		2.2		
Capacitance	C_D	at $V_R = 0\text{ V}$; $f = 1\text{ MHz}$		115	150	pF
		at $V_R = 6\text{ V}$; $f = 1\text{ MHz}$		50		

■ Electrical Characteristics GSOT15 ($T_{amb} = 25\text{ }^{\circ}\text{C}$ unless otherwise specified)
between pin 3 and pin 1

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Protection paths	Nchannel	Number of lines which can be protected			1	lines
Reverse stand-off voltage	V_{RWM}	Max. reverse working voltage			15	V
Reverse voltage	V_R	at $I_R = 1\text{ }\mu\text{A}$	15			
Reverse current	I_R	at $V_R = 15\text{ V}$			1	μA
Reverse breakdown voltage	V_{BR}	at $I_R = 1\text{ mA}$	16.5	18	20	V
Reverse clamping voltage	V_C	at $I_{PP} = 1\text{ A}$		19.4	23.5	
		at $I_{PP} = I_{PPM} = 8\text{ A}$		24.8	28.8	
Forward clamping voltage	V_F	at $I_{PP} = 1\text{ A}$		1	1.2	
		at $I_{PP} = I_{PPM} = 8\text{ A}$		1.8		
Capacitance	C_D	at $V_R = 0\text{ V}$; $f = 1\text{ MHz}$		90	120	pF
		at $V_R = 7.5\text{ V}$; $f = 1\text{ MHz}$		35		

■ Electrical Characteristics GSOT24 ($T_{amb} = 25\text{ }^{\circ}\text{C}$ unless otherwise specified)
between pin 3 and pin 1

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Protection paths	Nchannel	Number of lines which can be protected			1	lines
Reverse stand-off voltage	V_{RWM}	Max. reverse working voltage			24	V
Reverse voltage	V_R	at $I_R = 1\text{ }\mu\text{A}$	24			
Reverse current	I_R	at $V_R = 24\text{ V}$			1	μA
Reverse breakdown voltage	V_{BR}	at $I_R = 1\text{ mA}$	27	30	33	V
Reverse clamping voltage	V_C	at $I_{PP} = 1\text{ A}$		34	41	
		at $I_{PP} = I_{PPM} = 5\text{ A}$		41	47	
Forward clamping voltage	V_F	at $I_{PP} = 1\text{ A}$		1	1.2	
		at $I_{PP} = I_{PPM} = 5\text{ A}$		1.4		
Capacitance	C_D	at $V_R = 0\text{ V}$; $f = 1\text{ MHz}$		65	80	pF
		at $V_R = 12\text{ V}$; $f = 1\text{ MHz}$		20		

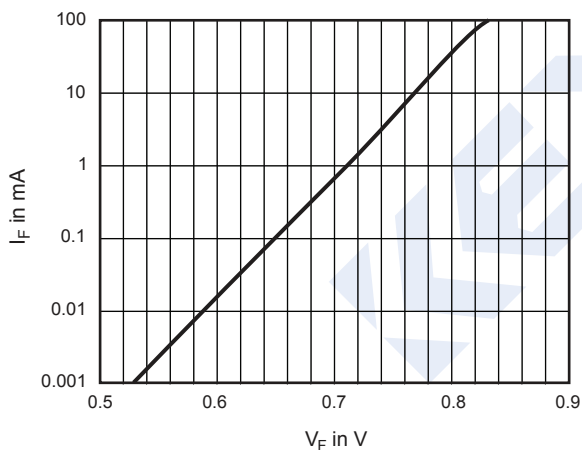
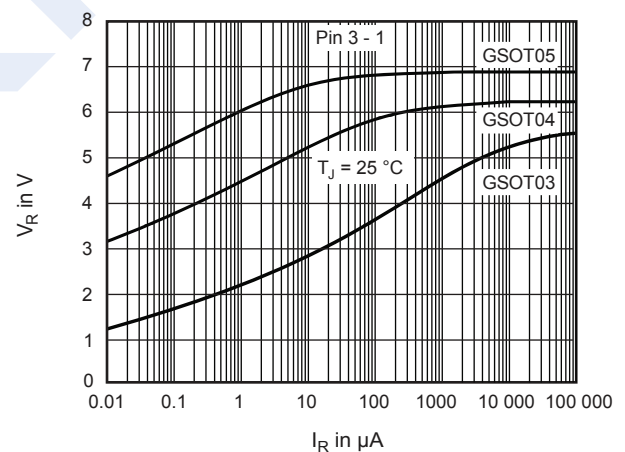
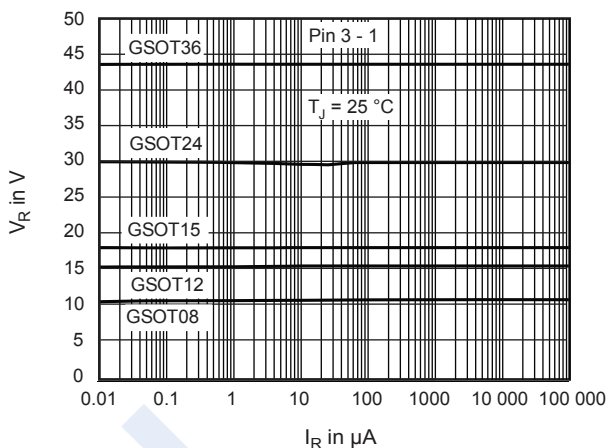
ESD Protection Diodes

GSOT03 ~ GSOT36

■ Electrical Characteristics GSOT36 ($T_{amb} = 25^\circ\text{C}$ unless otherwise specified)
between pin 3 and pin 1

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Protection paths	Nchannel	Number of lines which can be protected			1	lines
Reverse stand-off voltage	V_{RWM}	Max. reverse working voltage			36	V
Reverse voltage	V_R	at $I_R = 1\ \mu\text{A}$	36			
Reverse current	I_R	at $V_R = 36\ \text{V}$			1	μA
Reverse breakdown voltage	V_{BR}	at $I_R = 1\ \text{mA}$	39	43	47	V
Reverse clamping voltage	V_C	at $I_{PP} = 1\ \text{A}$		49	60	
		at $I_{PP} = I_{PPM} = 3.5\ \text{A}$		59	71	
Forward clamping voltage	V_F	at $I_{PP} = 1\ \text{A}$		1	1.2	
		at $I_{PP} = I_{PPM} = 3.5\ \text{A}$		1.3		
Capacitance	C_D	at $V_R = 0\ \text{V}$; $f = 1\ \text{MHz}$		52	65	pF
		at $V_R = 18\ \text{V}$; $f = 1\ \text{MHz}$		12		

■ Typical Characteristics

Fig. 1 - Typical Forward Current I_F vs. Forward Voltage V_F Fig. 3 - Typical Reverse Voltage V_R vs. Reverse Current I_R Fig. 2 - Typical Reverse Voltage V_R vs. Reverse Current I_R