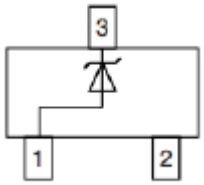
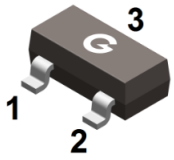
Two-Line ESD Protection TGSOT03 – TGSOT24

FEATURES

- ESD / transient protection of high speed data lines
  - IEC 61000-4-2 (ESD): ±30 kV (air), ±30 kV (contact)
- Two-line ESD-protection device
- RoHS compliant with Halogen-free
- Qualified to AEC-Q101 Standards

HF





SOT-23

APPLICATIONS

- Cell Phone Handsets and Accessories
- Microprocessor based equipment

ORDERING INFORMATION

Type No.	Marking	Package Code
TGSOT03	03	SOT-23
TGSOT05	05	SOT-23
TGSOT12	12	SOT-23
TGSOT24	24	SOT-23

MAXIMUM RATING @ Ta=25℃ unless otherwise specified

TGSOT03				
Parameter	Test Conditions	**Symbol**	**Limits**	**Unit**
Peak pulse power	Pin 1 to 3 acc. IEC 61000-4-5, tp = 8/20 μs; single shot	P_{pp}	369	W
Peak pulse current	Pin 1 to 3 IEC 61000-4-5, tp = 8/20 μs; single shot	I_{PP}	30	A
ESD immunity	IEC 61000-4-2; ESD (Air)	V_{ESD-A}	±30	kV
	IEC 61000-4-2; ESD (Contact)	V_{ESD-C}	±30	kV
Operating temperature	Junction temperature	T_j	-55 to+150	℃
Storage temperature	/	T_{STG}	-55 to+150	℃

Two-Line ESD Protection TGSOT03 – TGSOT24

TGSOT05				
Parameter	**Test Conditions**	**Symbol**	**Limits**	**Unit**
Peak pulse power	Pin 1 to 3 acc. IEC 61000-4-5, tp = 8/20 μs; single shot	P_{pp}	480	W
Peak pulse current	Pin 1 to 3 acc. IEC 61000-4-5, tp = 8/20 μs; single shot	I_{PP}	30	A
ESD immunity	IEC 61000-4-2; ESD (Air)	V_{ESD-A}	±30	kV
	IEC 61000-4-2; ESD (Contact)	V_{ESD-C}	±30	kV
Operating temperature	Junction temperature	T_j	-55 to+150	℃
Storage temperature	/	T_{STG}	-55 to+150	℃

TGSOT12				
Parameter	**Test Conditions**	**Symbol**	**Limits**	**Unit**
Peak pulse power	Pin 1 to 3 acc. IEC 61000-4-5, tp = 8/20 μs; single shot	P_{pp}	312	W
Peak pulse current	Pin 1 to 3 acc. IEC 61000-4-5, tp = 8/20 μs; single shot	I_{PP}	12	A
ESD immunity	IEC 61000-4-2; ESD (Air)	V_{ESD-A}	±30	kV
	IEC 61000-4-2; ESD (Contact)	V_{ESD-C}	±30	kV
Operating temperature	Junction temperature	T_j	-55 to+150	℃
Storage temperature	/	T_{STG}	-55 to+150	℃

Two-Line ESD Protection TGSOT03 – TGSOT24

TGSOT24				
Parameter	**Test Conditions**	**Symbol**	**Limits**	**Unit**
Peak pulse power	Pin 1 to 3 acc. IEC 61000-4-5, tp = 8/20 μs; single shot	P_{pp}	235	W
Peak pulse current	Pin 1 to 3 acc. IEC 61000-4-5, tp = 8/20 μs; single shot	I_{PP}	5	A
ESD immunity	IEC 61000-4-2; ESD (Air)	V_{ESD-A}	±30	kV
	IEC 61000-4-2; ESD (Contact)	V_{ESD-C}	±30	kV
Operating temperature	Junction temperature	T_j	-55 to+150	℃
Storage temperature	/	T_{STG}	-55 to+150	℃

ELECTRICAL CHARACTERISTICS @ Ta=25℃ unless otherwise specified

TGSOT03 **between pin 1 to pin 3**						
Parameter	**Symbol**	**Min.**	**Typ.**	**Max.**	**Unit**	**Conditions**
Reverse stand-off voltage	V_{RWM}			3.3	V	I_R=100uA
Reverse current	I_R			100	uA	V_R=3.3V
Reverse breakdown voltage	V_{BR}	4	4.6		V	I_R=1mA
Clamping voltage	V_C		5.7 10	7.5 12.3	V	I_{PP}=1A I_{PP}= I_{PPM}=30A
Forward clamping voltage	V_F		1 4.5	1.2	V	I_{PP}=1A I_{PP}= I_{PPM}=30A
Junction Capacitance	C_D		420 260	600	pF	V_R=0V,f=1MHz V_R=1.6V,f=1MHz

Two-Line ESD Protection TGSOT03 – TGSOT24

TGSOT05 **between pin 1 to pin 3**						
Parameter	**Symbol**	**Min.**	**Typ.**	**Max.**	**Unit**	**Conditions**
Reverse stand-off voltage	V_{RWM}			5	V	I_R=100uA
Reverse current	I_R			10	uA	V_R=5V
Reverse breakdown voltage	V_{BR}	6	6.8		V	I_R=1mA
Clamping voltage	V_C		7 12	8.7 16	V	I_{PP}=1A I_{PP}= I_{PPM}=30A
Forward clamping voltage	V_F		1 4.5	1.2	V	I_{PP}=1A I_{PP}= I_{PPM}=30A
Junction Capacitance	C_D		260 150	350	pF	V_R=0V,f=1MHz V_R=2.5V,f=1MHz

TGSOT12 **between pin 1 to pin 3**						
Parameter	**Symbol**	**Min.**	**Typ.**	**Max.**	**Unit**	**Conditions**
Reverse stand-off voltage	V_{RWM}			12	V	I_R=1uA
Reverse current	I_R			1	uA	V_R=12V
Reverse breakdown voltage	V_{BR}	13.5	15		V	I_R=1mA
Clamping voltage	V_C		15.4 21.2	18.7 26	V	I_{PP}=1A I_{PP}= I_{PPM}=12A
Forward clamping voltage	V_F		1 2.2	1.2	V	I_{PP}=1A I_{PP}= I_{PPM}=12A
Junction Capacitance	C_D		115 50	150	pF	V_R=0V,f=1MHz V_R=6V,f=1MHz

Two-Line ESD Protection TGSOT03 – TGSOT24

TGSOT24 **between pin 1 to pin 3**						
Parameter	**Symbol**	**Min.**	**Typ.**	**Max.**	**Unit**	**Conditions**
Reverse stand-off voltage	V_{RWM}			24	V	I_R=1uA
Reverse current	I_R			1	uA	V_R=24V
Reverse breakdown voltage	V_{BR}	27	30		V	I_R=1mA
Clamping voltage	V_C		34 41	41 47	V	I_{PP}=1A I_{PP}= I_{PPM}=5A
Forward clamping voltage	V_F		1 1.4	1.2	V	I_{PP}=1A I_{PP}= I_{PPM}=5A
Junction Capacitance	C_D		65 20	80	pF	V_R=0V,f=1MHz V_R=12V,f=1MHz

Two-Line ESD Protection TGSOT03 – TGSOT24

TYPICAL CHARACTERISTICS @ Ta=25℃ unless otherwise specified

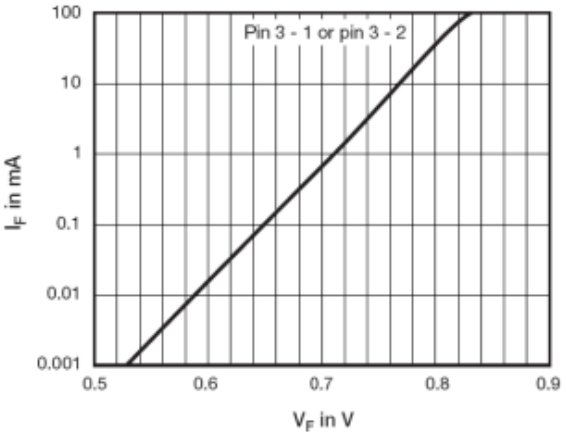


Fig. 1 - Typical Forward Current I_F vs. Forward Voltage V_F

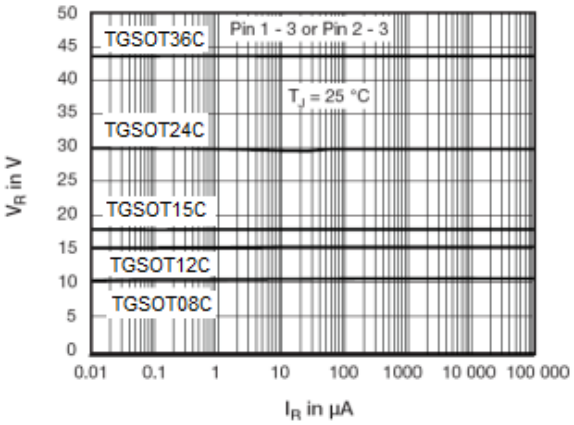


Fig. 2 - Typical Reverse Voltage V_R vs. Reverse Current I_R

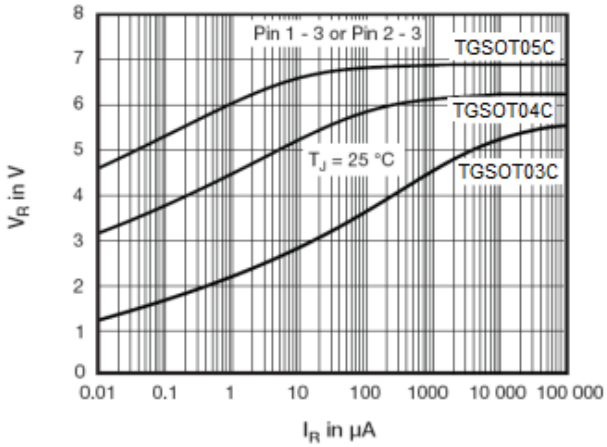
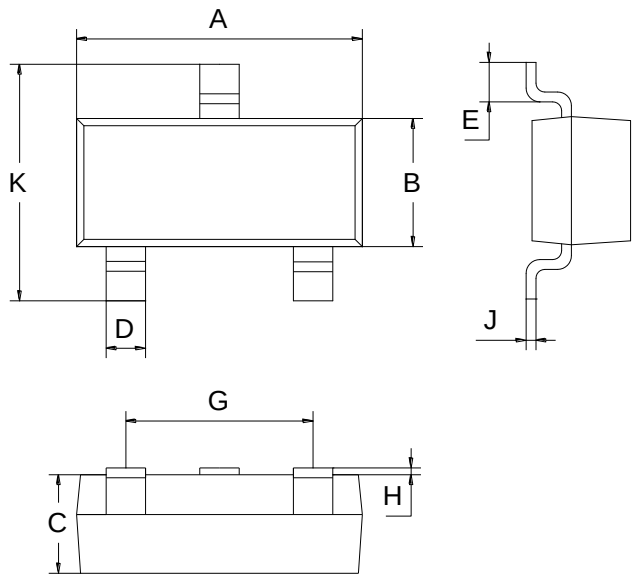


Fig. 3 - Typical Reverse Voltage V_R vs. Reverse Current I_R

Two-Line ESD Protection TGSOT03 – TGSOT24

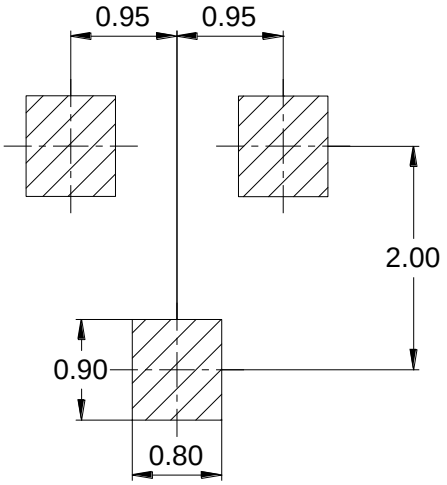
PACKAGE OUTLINE

Plastic surface mounted package SOT-23



SOT-23		
Dim	Min	Max
A	2.70	3.10
B	1.10	1.50
C	0.90	1.10
D	0.30	0.50
E	0.35	0.48
G	1.80	2.00
H	0.02	0.10
J	0.05	0.15
K	2.20	2.60
All Dimensions in mm		

SOLDERING FOOTPRINT



Unit: mm

PACKAGE INFORMATION

Device	Package	Shipping
TGSOT03 - TGSOT24	SOT-23	3000 pcs / Tape & Reel