MOSFET

SIPMOS® Small-Signal-Transistor

SOT-23

Features

- N-channel
- Depletion mode
- d*v*/d*t* rated
- Pb-free lead plating; RoHS compliant
- Halogen-free according to IEC61249-2-21

Product validation

Fully qualified according to JEDEC for Industrial Applications

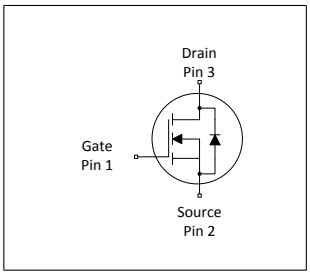


Table 1 Key Performance Parameters

Parameter	Value	Unit
V_{DS}	600	V
$R_{DS(on),max}$	700	Ω
$I_{DSS,min}$	0.007	A

Type / Ordering Code	Package	Marking	Related Links
BSS126I	PG-SOT23	Sh	-

Table of Contents

1 Maximum ratings

at T_A=25 °C, unless otherwise specified

Table 2 Maximum ratings

Parameter	Symbol	Values			Unit	Note / Test Condition
		Min.	Typ.	Max.		
Continuous drain current	I_D	- -	- -	0.021 0.017	A	T_A=25 °C T_A=70 °C
Pulsed drain current	$I_{D,pulse}$	-	-	0.085	A	T_A=25 °C
Reverse diode d*v*/d*t*	d*v*/d*t*	-	-	6	kV/µs	I_D=0.016 A, V_{DS}=20 V, d*i*/d*t*=200 A/µs, $T_{j,max}$=150 °C
Gate source voltage	V_{GS}	-20	-	20	V	-
ESD sensitivity (HBM) as per JESD22-A114	-	-	-	Class 0 (0 >250 V)	-	-
Power dissipation	P_{tot}	-	-	0.50	W	T_A=25 °C
Operating and storage temperature	T_j, T_{stg}	-55	-	150	°C	IEC climatic category; DIN IEC 68-1: 55/150/56

2 Thermal characteristics

Table 3 Thermal characteristics

Parameter	Symbol	Values			Unit	Note / Test Condition
		Min.	Typ.	Max.		
Thermal resistance, junction - ambient, minimal footprint	R_{thJA}	-	-	250	K/W	-

3 Electrical characteristics

at T_j=25 °C, unless otherwise specified

Table 4 Static characteristics

Parameter	Symbol	Values			Unit	Note / Test Condition
		Min.	Typ.	Max.		
Drain-source breakdown voltage	$V_{(BR)DSS}$	600	-	-	V	V_{GS}=-5 V, I_D=250 µA
Gate threshold voltage	$V_{GS(th)}$	-2.7	-2.0	-1.6	V	V_{DS}=3 V, I_D=8 µA
Drain-source cutoff current	$I_{D(off)}$	- -	- -	0.1 10	µA	V_{DS}=600 V, V_{GS}=-5 V, T_j=25 °C V_{DS}=600 V, V_{GS}=-5 V, T_j=125 °C
Gate-source leakage current	I_{GSS}	-	-	100	nA	V_{GS}=20 V, V_{DS}=0 V
On-state drain current	I_{DSS}	7	-	-	mA	V_{GS}=0 V, V_{DS}=25 V
Drain-source on-state resistance	$R_{DS(on)}$	- -	320 280	700 500	Ω	V_{GS}=0 V, I_D=3 mA V_{GS}=10 V, I_D=16 mA
Transconductance	g_{fs}	0.008	0.017	-	S	$\|V_{DS}\|>2\|I_D\|R_{DS(on)max}$, I_D=0.01 A

Table 5 Dynamic characteristics

Parameter	Symbol	Values			Unit	Note / Test Condition
		Min.	Typ.	Max.		
Input capacitance	C_{iss}	-	21	-	pF	V_{GS}=-5 V, V_{DS}=25 V, f=1 MHz
Output capacitance	C_{oss}	-	2.4	-	pF	V_{GS}=-5 V, V_{DS}=25 V, f=1 MHz
Reverse transfer capacitance	C_{rss}	-	1.0	-	pF	V_{GS}=-5 V, V_{DS}=25 V, f=1 MHz
Turn-on delay time	$t_{d(on)}$	-	6.1	-	ns	V_{DD}=300 V, V_{GS}=-3$_B$7 V, I_D=0.01 A, R_G=6 Ω
Rise time	t_r	-	9.7	-	ns	V_{DD}=300 V, V_{GS}=-3$_B$7 V, I_D=0.01 A, R_G=6 Ω
Turn-off delay time	$t_{d(off)}$	-	14	-	ns	V_{DD}=300 V, V_{GS}=-3$_B$7 V, I_D=0.01 A, R_G=6 Ω
Fall time	t_f	-	115	-	ns	V_{DD}=300 V, V_{GS}=-3$_B$7 V, I_D=0.01 A, R_G=6 Ω

Table 6 Gate charge characteristics

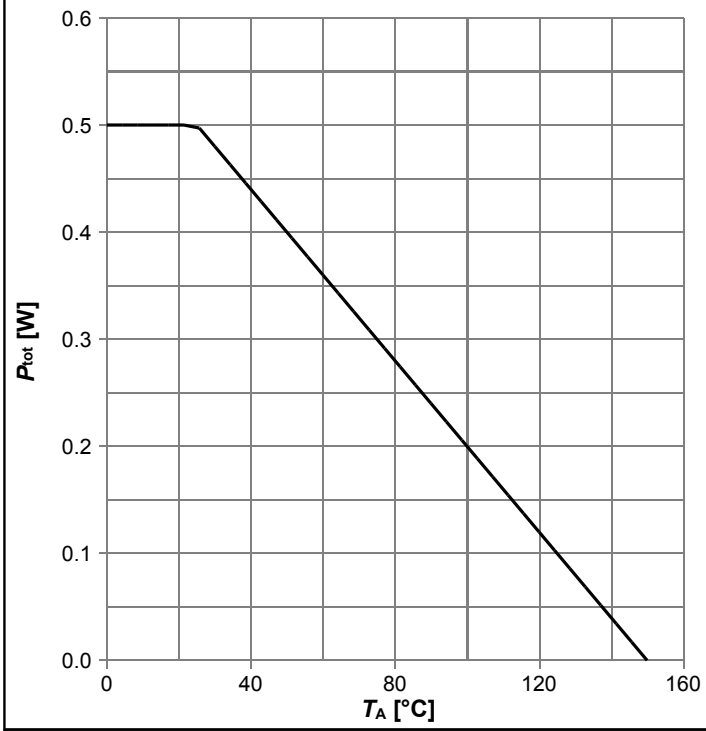
Parameter	Symbol	Values			Unit	Note / Test Condition
		Min.	Typ.	Max.		
Gate to source charge	Q_{gs}	-	0.05	-	nC	V_{DD}=400 V, I_D=10 mA, V_{GS}=-3 to 5 V
Gate to drain charge	Q_{gd}	-	1.2	-	nC	V_{DD}=400 V, I_D=10 mA, V_{GS}=-3 to 5 V
Gate charge total	Q_g	-	1.4	-	nC	V_{DD}=400 V, I_D=10 mA, V_{GS}=-3 to 5 V
Gate plateau voltage	$V_{plateau}$	-	0.10	-	V	V_{DD}=400 V, I_D=10 mA, V_{GS}=-3 to 5 V

Table 7 Reverse diode

Parameter	Symbol	Values			Unit	Note / Test Condition
		Min.	Typ.	Max.		
Diode continous forward current	I_S	-	-	0.016	A	T_A=25 °C
Diode pulse current	$I_{S,pulse}$	-	-	0.064	A	T_A=25 °C
Diode forward voltage	V_{SD}	-	0.81	1.2	V	V_{GS}=-5 V, I_F=16 mA, T_j=25 °C
Reverse recovery time	t_{rr}	-	160	-	ns	V_R=300 V, I_F=0.01 A, di_F/dt=100 A/µs
Reverse recovery charge	Q_{rr}	-	13.2	-	nC	V_R=300 V, I_F=0.01 A, di_F/dt=100 A/µs

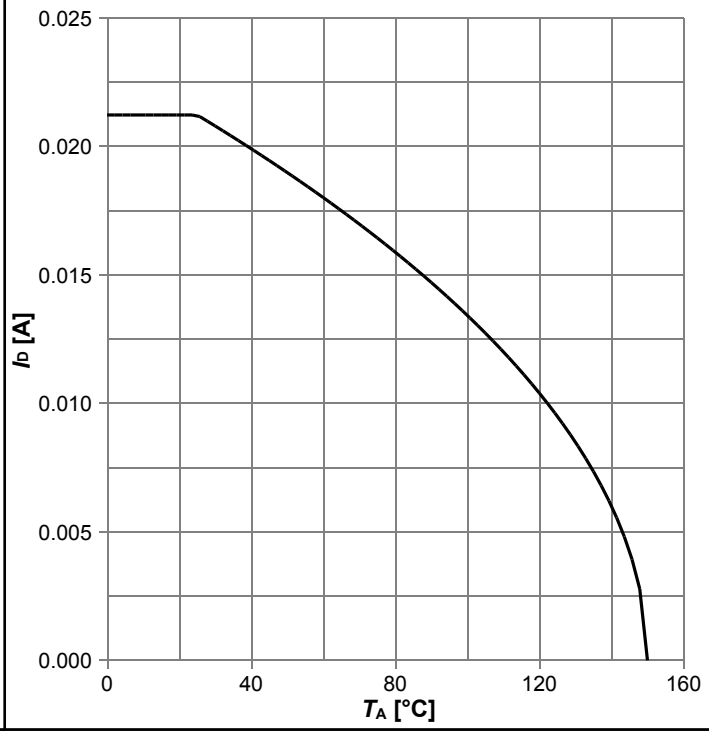
4 Electrical characteristics diagrams

Diagram 1: Power dissipation



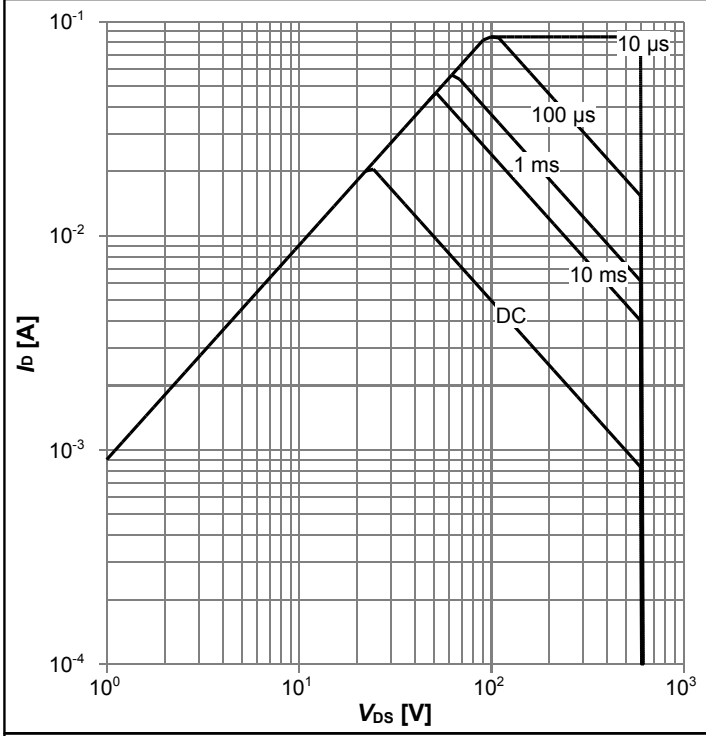
$P_{tot}=f(T_A)$

Diagram 2: Drain current



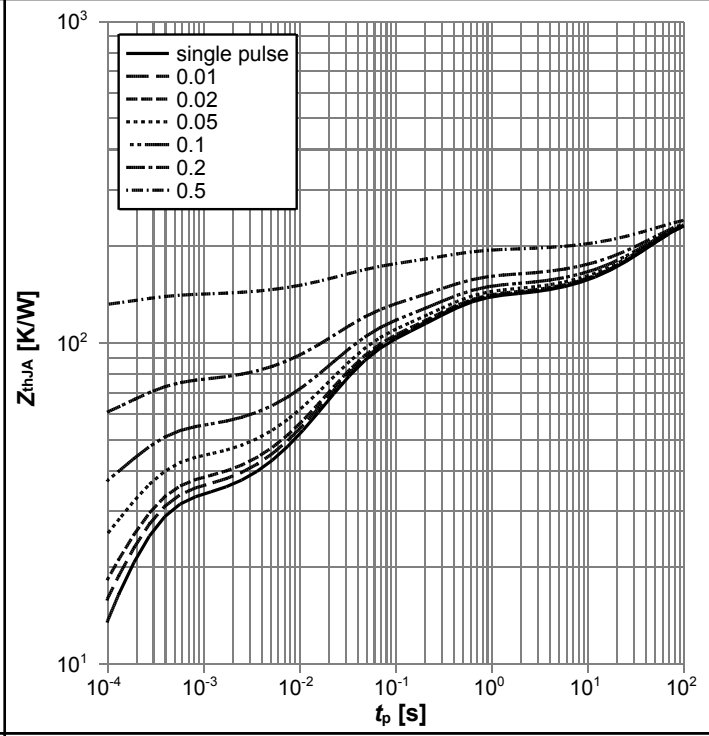
$I_D=f(T_A)$; $V_{GS}\geq 10$ V

Diagram 3: Safe operating area



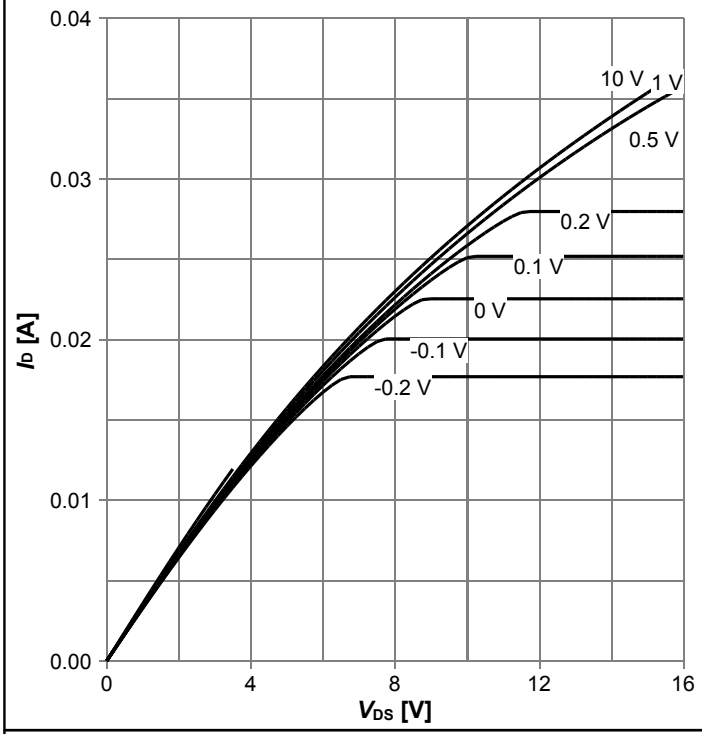
$I_D=f(V_{DS})$; $T_A=25$ °C; $D=0$; parameter: t_p

Diagram 4: Max. transient thermal impedance



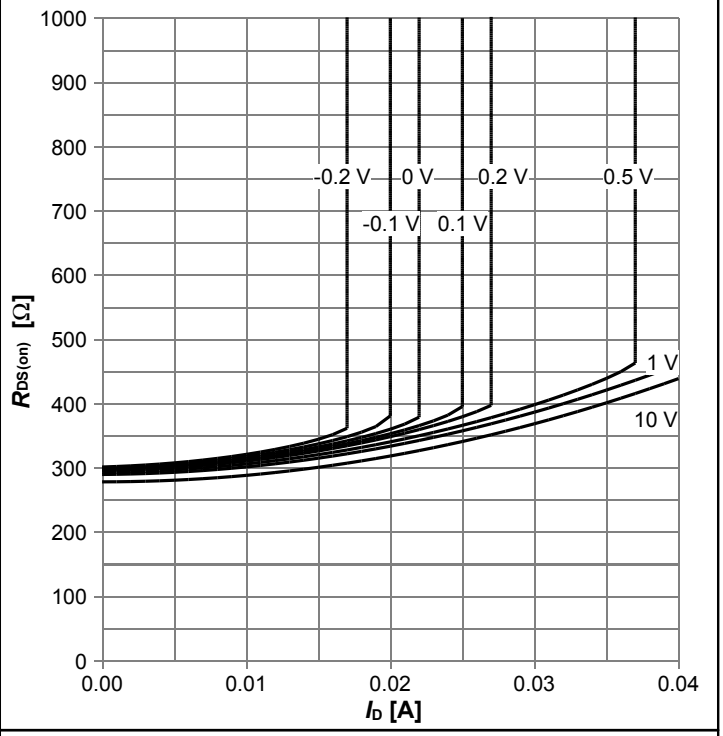
$Z_{thJA}=f(t_p)$; parameter: $D=t_p/T$

Diagram 5: Typ. output characteristics



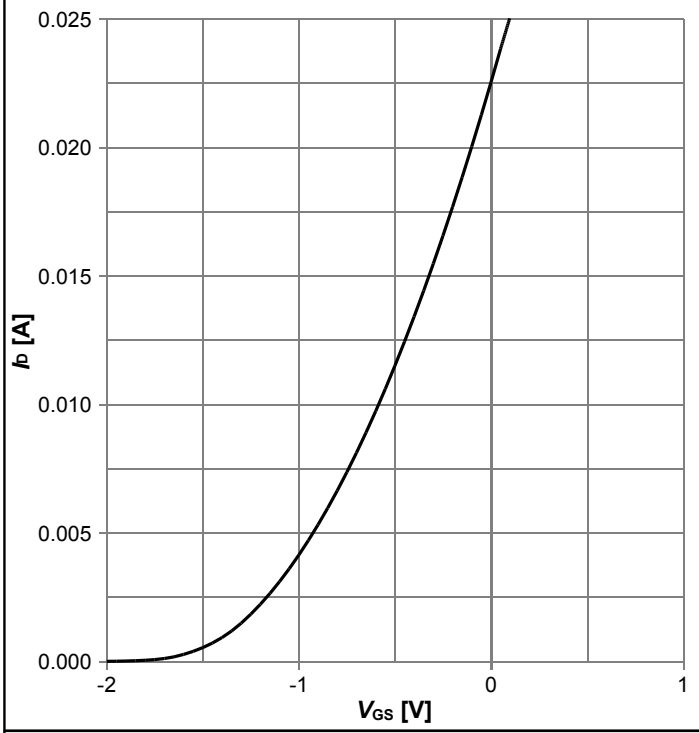
I_D=f(V_{DS}); T_j=25 °C; parameter: V_{GS}

Diagram 6: Typ. drain-source on resistance



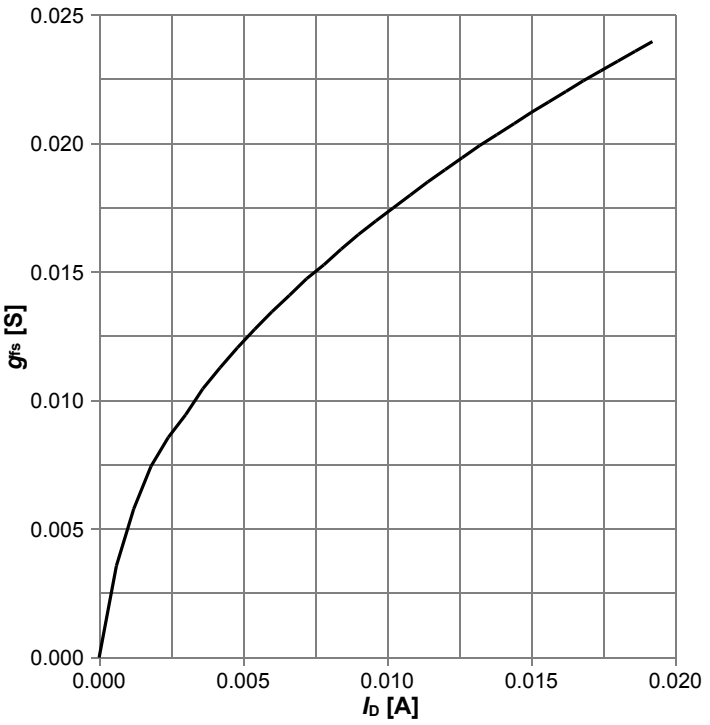
$R_{DS(on)}$=f(I_D); T_j=25 °C; parameter: V_{GS}

Diagram 7: Typ. transfer characteristics



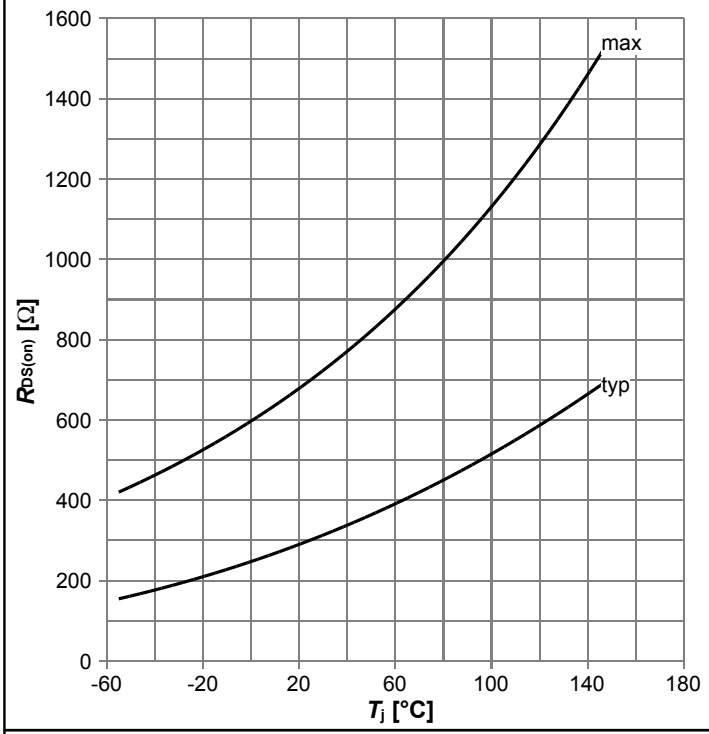
I_D=f(V_{GS}); V_{DS}=10 V; T_j=25 °C

Diagram 8: Typ. forward transconductance



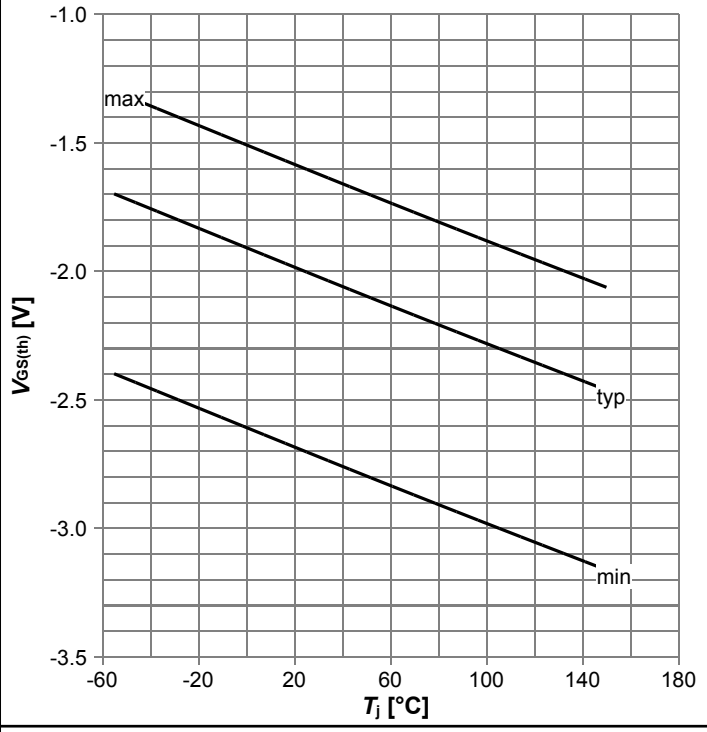
g_{fs}=f(I_D); T_j=25 °C

Diagram 9: Drain-source on-state resistance



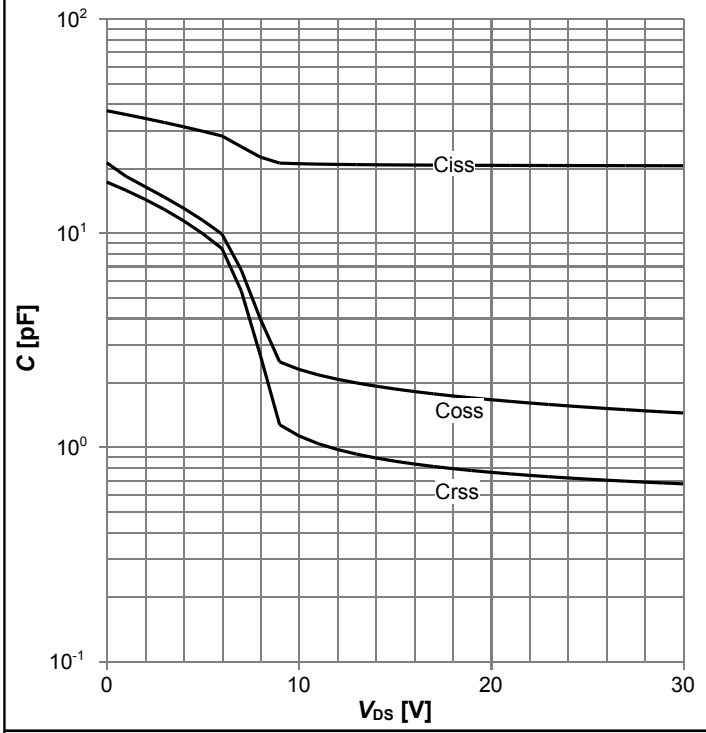
$R_{DS(on)}$=f(T_j); I_D=3 mA; V_{GS}=0 V

Diagram 10: Typ. gate threshold voltage



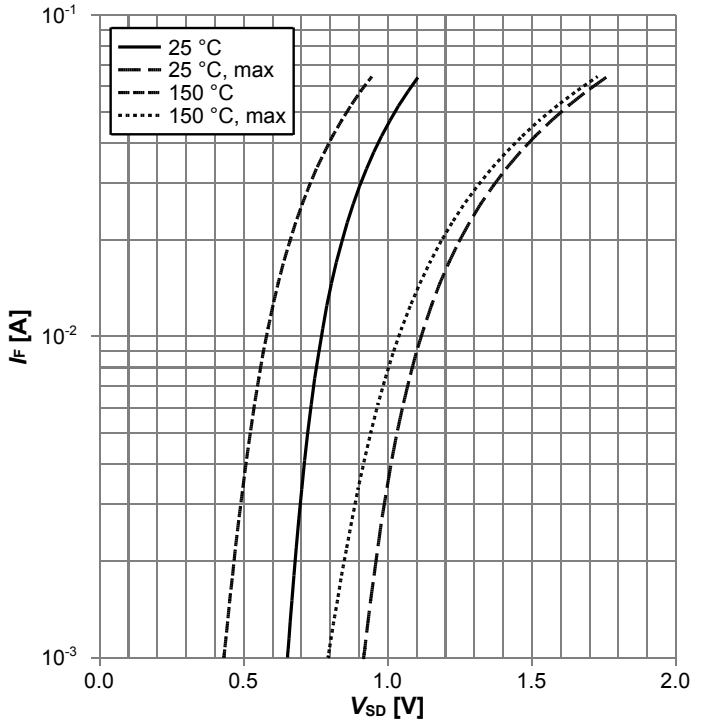
$V_{GS(th)}$=f(T_j); V_{DS}=3 V; I_D = 8 µA; parameter: I_D

Diagram 11: Typ. capacitances



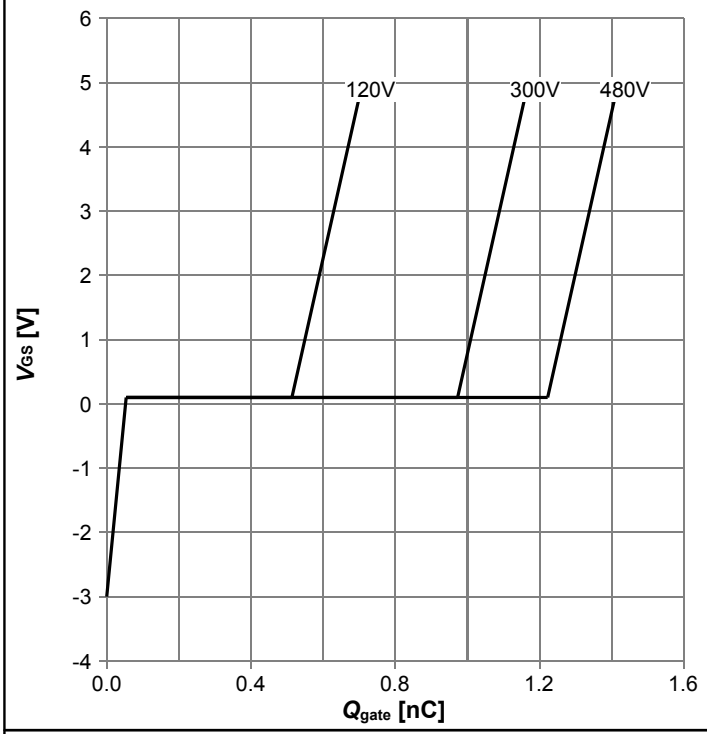
C=f(V_{DS}); V_{GS}=-3 V; f=1 MHz

Diagram 12: Forward characteristics of reverse diode



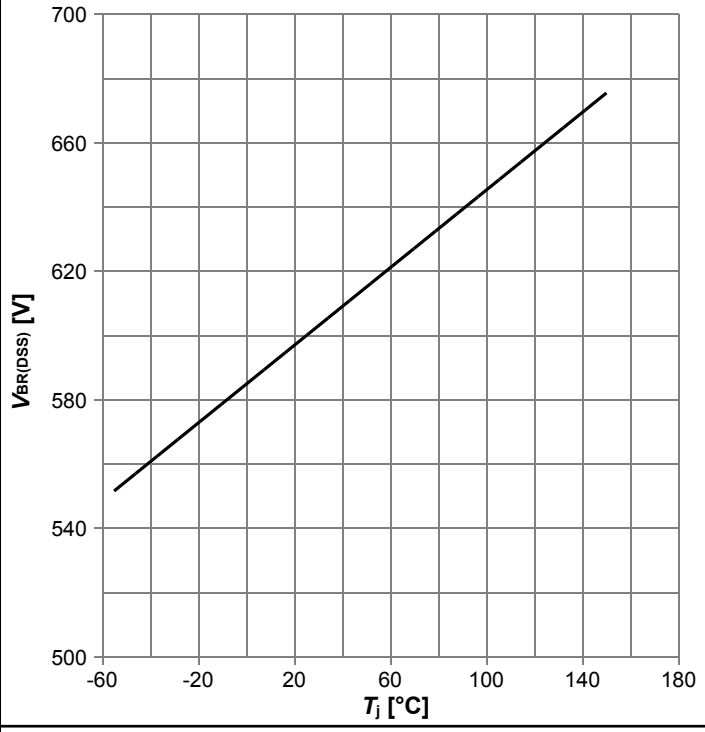
I_F=f(V_{SD}); parameter: T_j

Diagram 13: Typ. gate charge



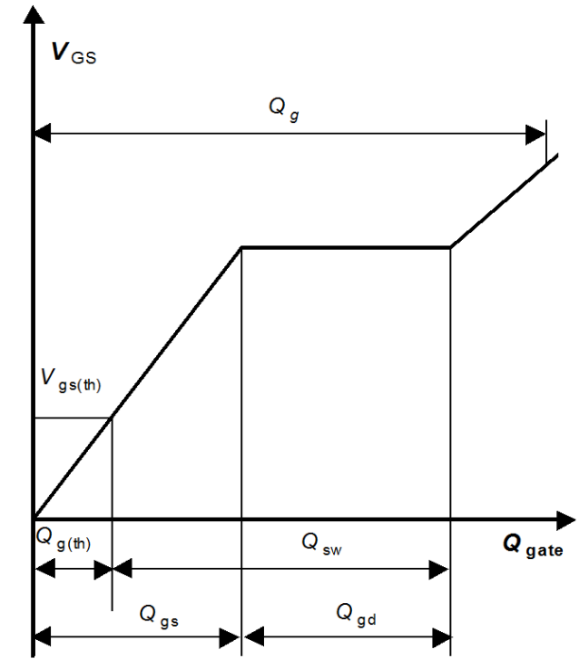
V_{GS}=f(Q_{gate}); I_D=0.01 A pulsed; parameter: V_{DD}

Diagram 14: Drain-source breakdown voltage



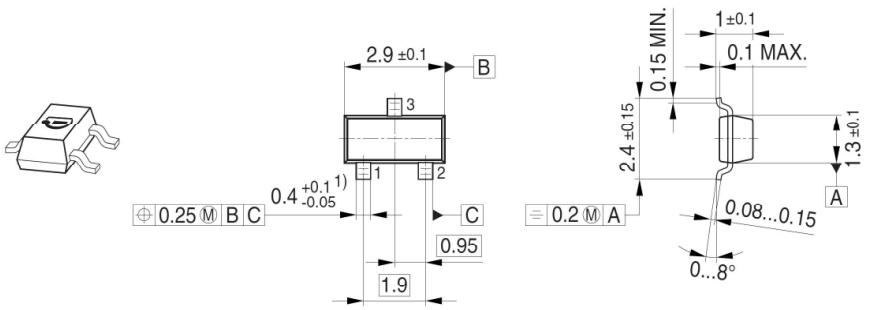
I_D=f(V_{GS}); V_{GS}=-3 V; T_j=25 °C

Diagram Gate charge waveforms



5 Package Outlines

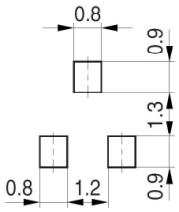
Package Outline



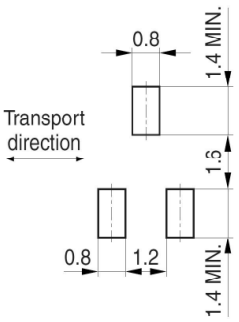
1) Lead width can be 0.6 max. in dambar area

Foot Print

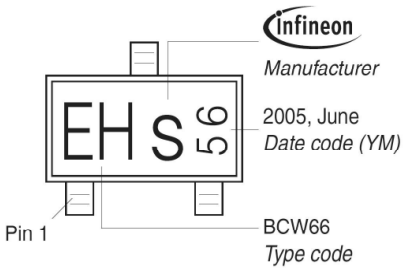
Soldering Type: Reflow Soldering



Soldering Type: Wave Soldering



Marking Layout (Example)



Tape and Reel

Reel ø180 mm: 3.000 Pieces/Reel
Reels/Box: 1 x 3.000 = 3.000
Reels/Box: 10 x 3.000 = 30.000

Reel ø330 mm: 10.000 Pieces/Reel
Reels/Box: 1 x 10.000 = 10.000

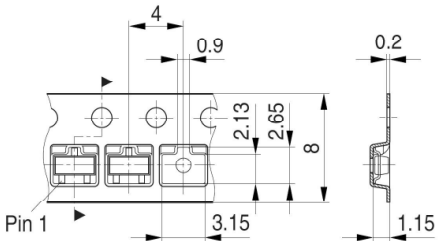


Figure 1 Outline PG-SOT23, dimensions in mm

Revision History

BSS126I

Revision: 2020-06-02, Rev. 2.0

Previous Revision		
Revision	Date	Subjects (major changes since last revision)
2.0	2020-06-02	Release of final version

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