

MOSFET

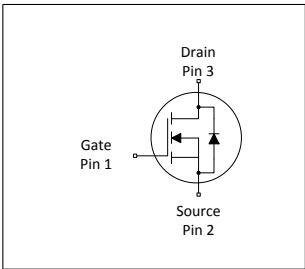
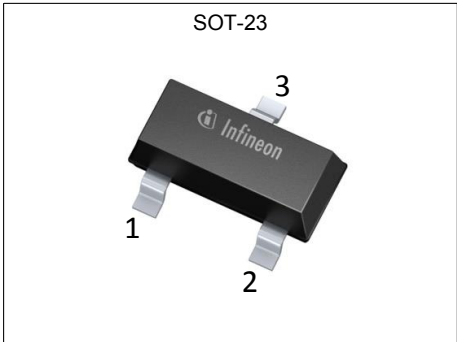
SIPMOS® Small-Signal-Transistor

Features

- N-channel
- Depletion mode
- dv/dt rated
- Pb-free lead plating; RoHS compliant
- Halogen-free according to IEC61249-2-21

Product validation

Fully qualified according to JEDEC for Industrial Applications



RoHS

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	Shs	-

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1 Maximum ratings

at $T_A=25\text{ °C}$, 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	$T_A=25\text{ °C}$ $T_A=70\text{ °C}$
Pulsed drain current	$I_{D,pulse}$	-	-	0.085	A	$T_A=25\text{ °C}$
Reverse diode dv/dt	dv/dt	-	-	6	kV/ μ s	$I_D=0.016\text{ A}$, $V_{DS}=20\text{ V}$, $di/dt=200\text{ A}/\mu\text{s}$, $T_{j,max}=150\text{ °C}$
Gate source voltage	V_{GS}	-20	-	20	V	-
ESD sensitivity (HBM) as per JESD22-A114	-	-	-	Class 0 ($<250\text{ V}$)	-	-
Power dissipation	P_{tot}	-	-	0.50	W	$T_A=25\text{ °C}$
Operating and storage temperature	T_j , T_{stg}	-55	-	150	°C	-

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

Table 5 Dynamic characteristics

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

Table 6 Gate charge characteristics

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

Table 7 Reverse diode

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

4 Electrical characteristics diagrams

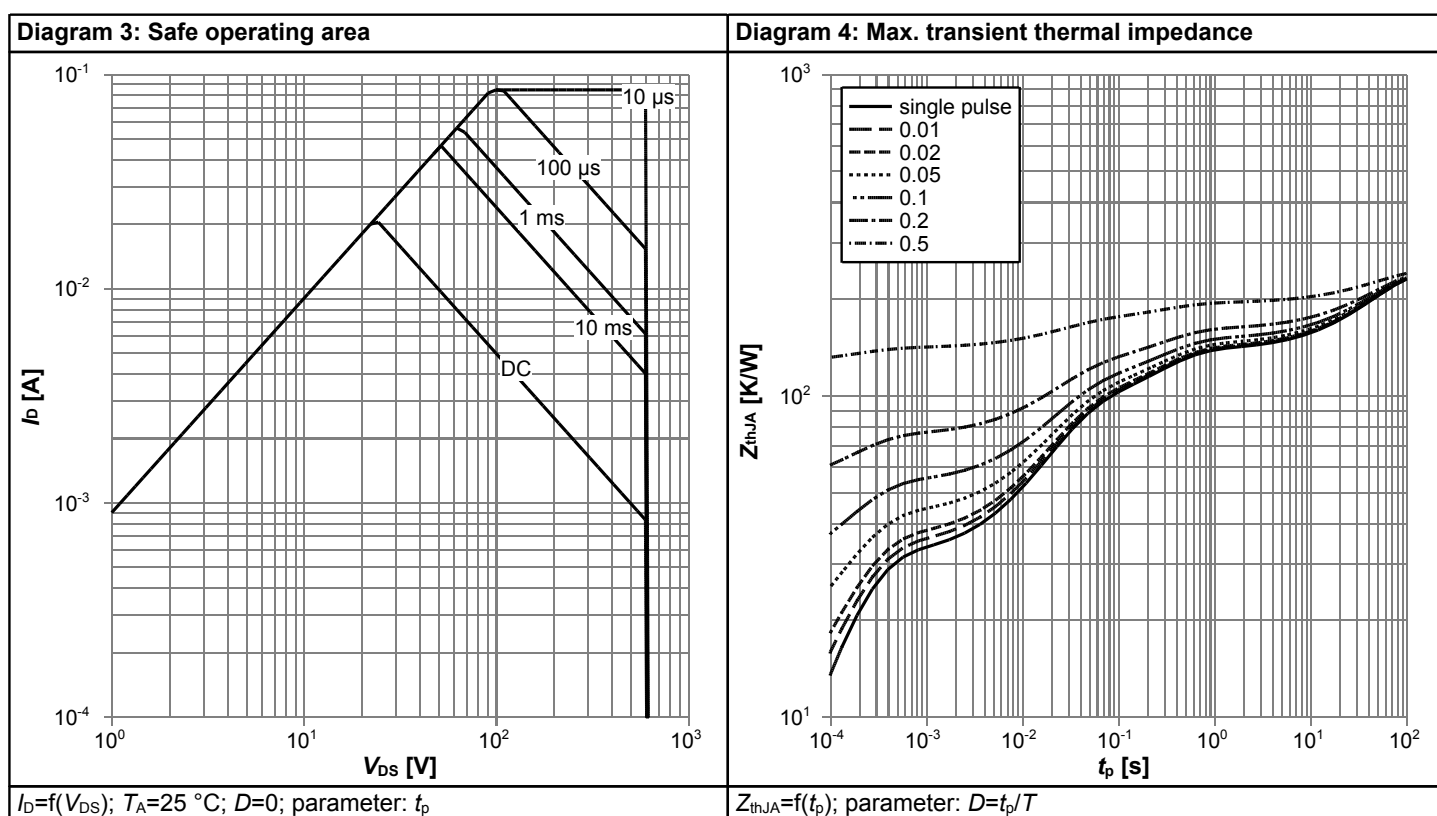
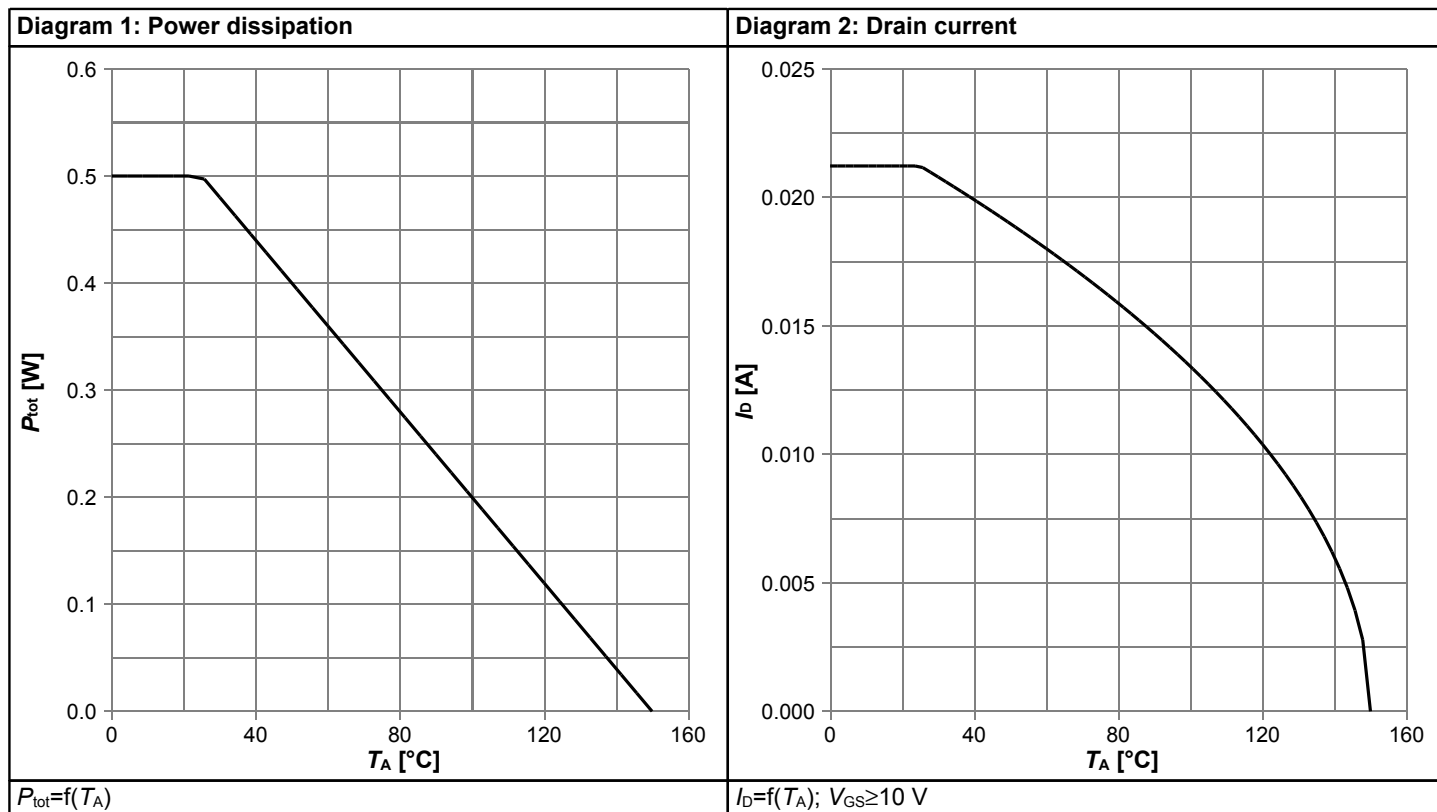
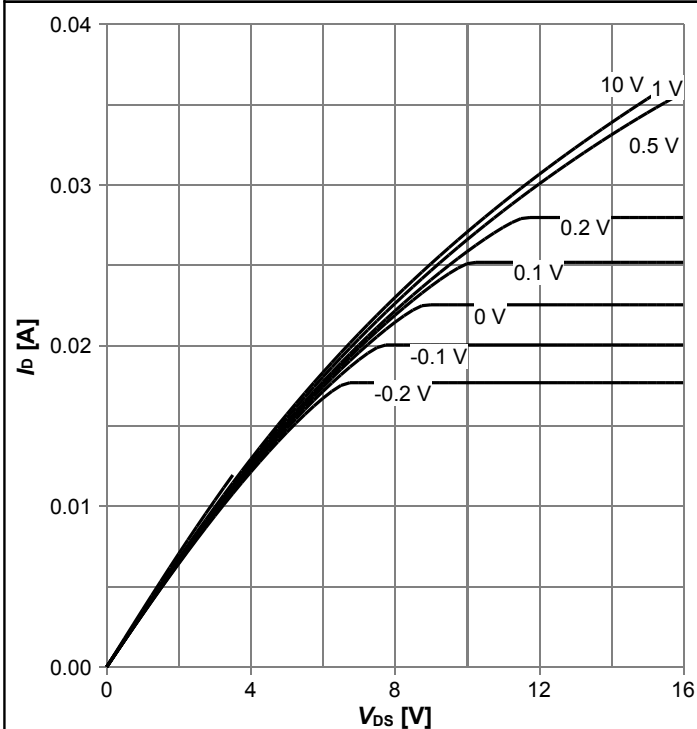
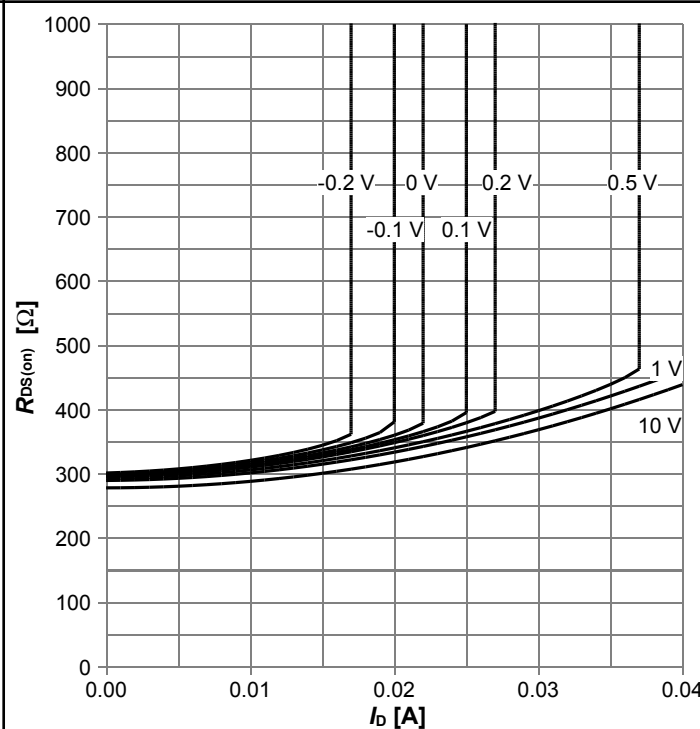


Diagram 5: Typ. output characteristics



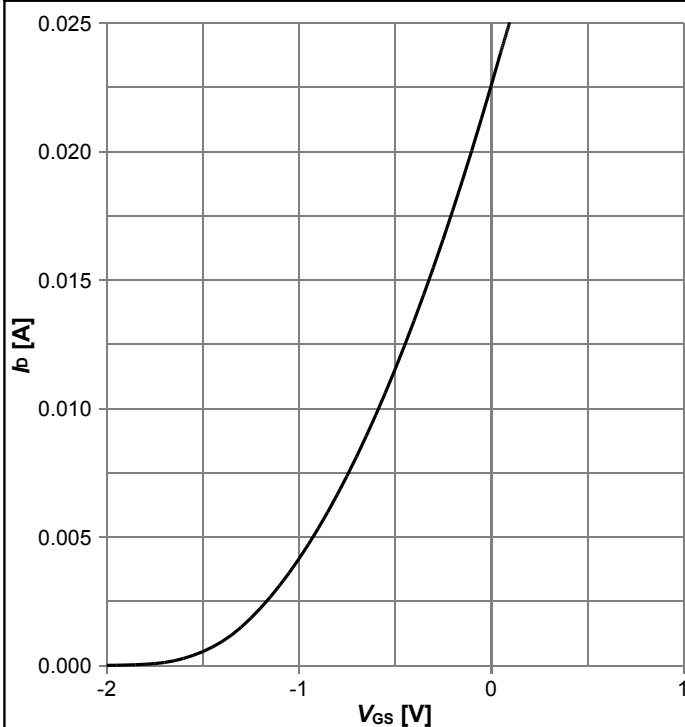
$I_D = f(V_{DS})$; $T_J = 25^\circ\text{C}$; parameter: V_{GS}

Diagram 6: Typ. drain-source on resistance



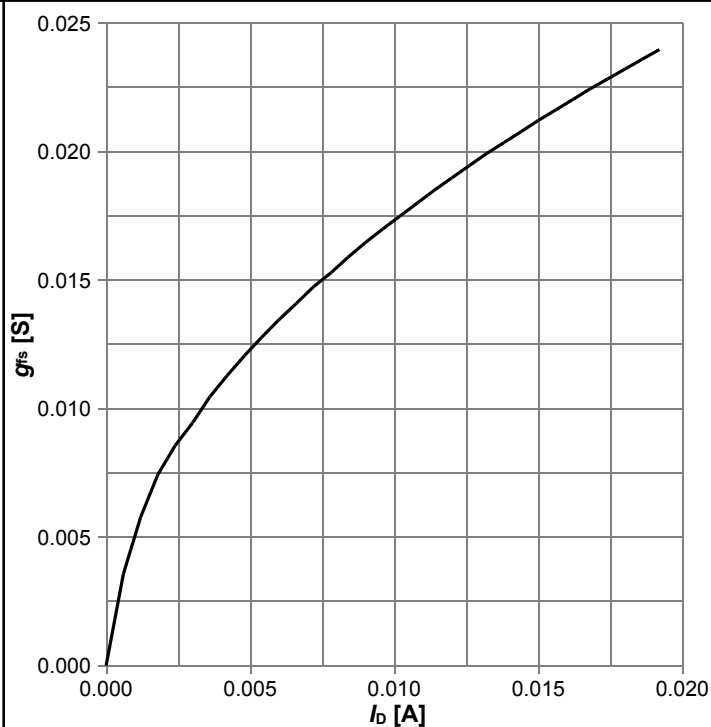
$R_{DS(on)} = f(I_D)$; $T_J = 25^\circ\text{C}$; parameter: V_{GS}

Diagram 7: Typ. transfer characteristics



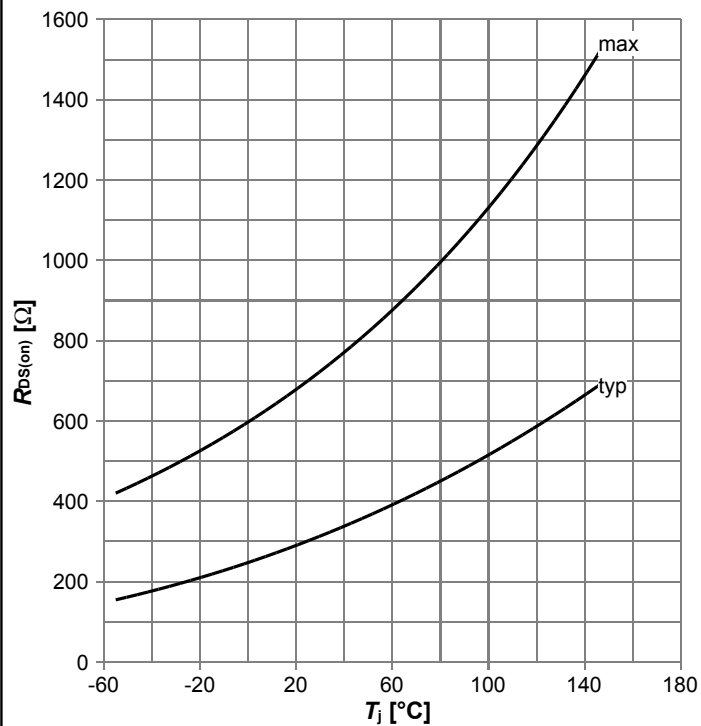
$I_D = f(V_{GS})$; $V_{DS} = 10\text{ V}$; $T_J = 25^\circ\text{C}$

Diagram 8: Typ. forward transconductance



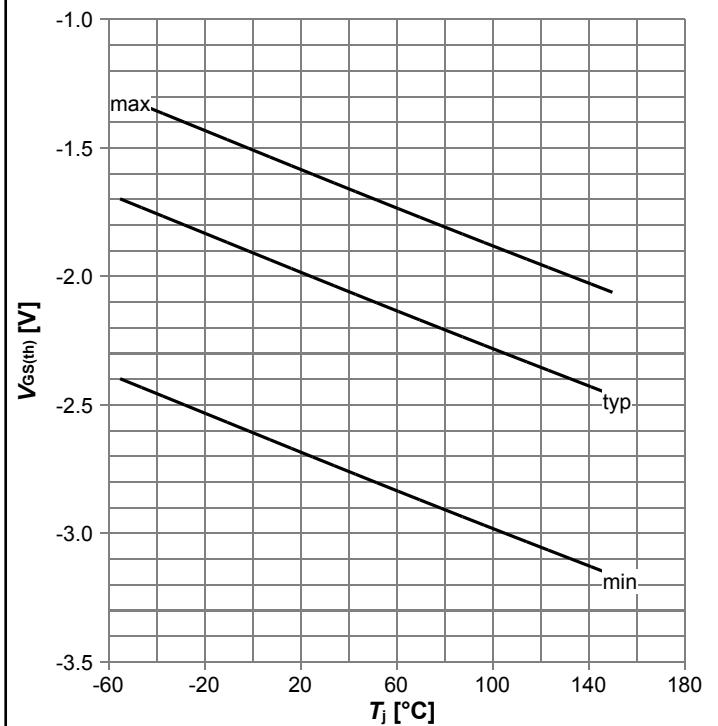
$g_{fs} = f(I_D)$; $T_J = 25^\circ\text{C}$

Diagram 9: Drain-source on-state resistance



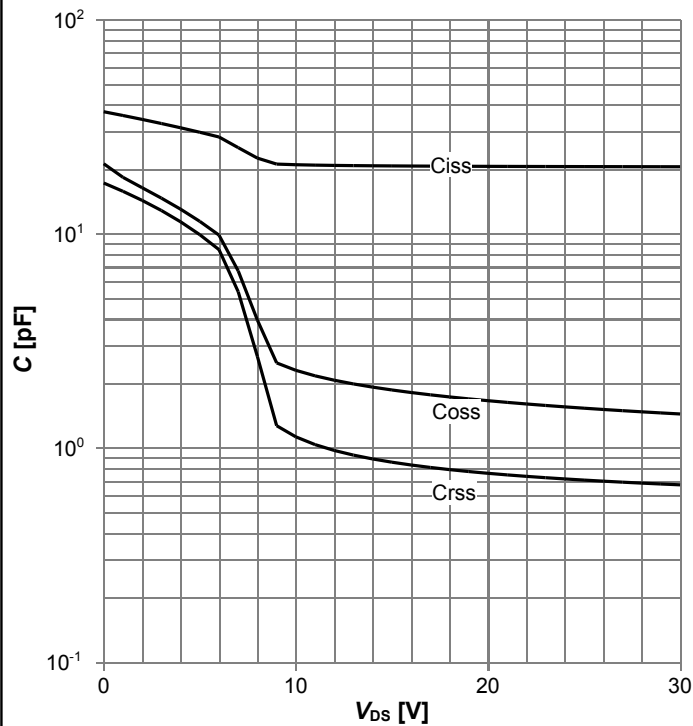
$R_{DS(on)}=f(T_j)$; $I_D=3$ mA; $V_{GS}=0$ V

Diagram 10: Typ. gate threshold voltage



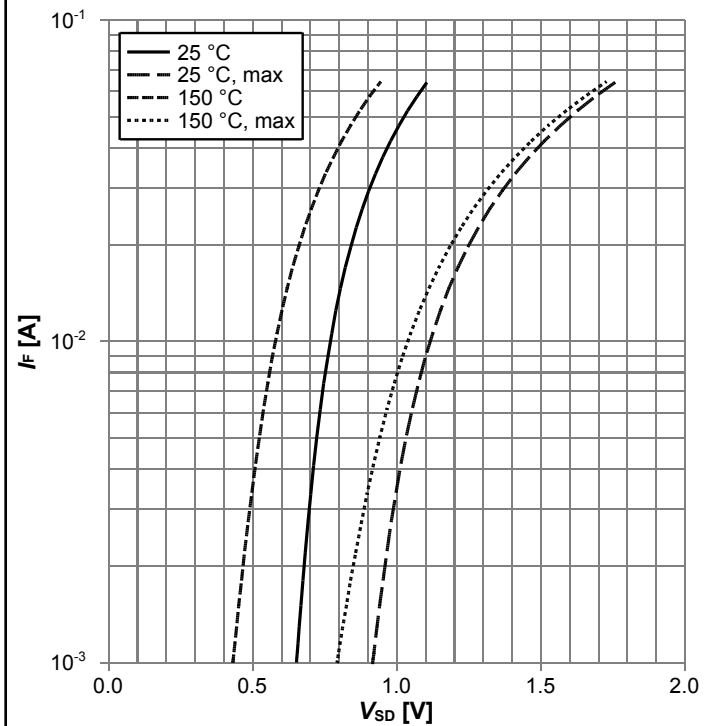
$V_{GS(th)}=f(T_j)$; $V_{DS}=3$ V; $I_D=8$ μA; parameter: I_D

Diagram 11: Typ. capacitances



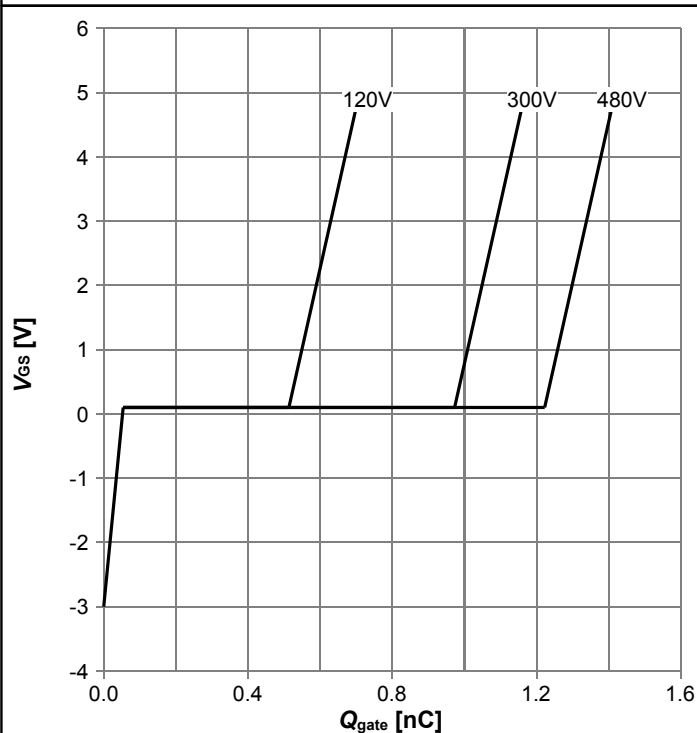
$C=f(V_{DS})$; $V_{GS}=-3$ V; $f=1$ MHz

Diagram 12: Forward characteristics of reverse diode



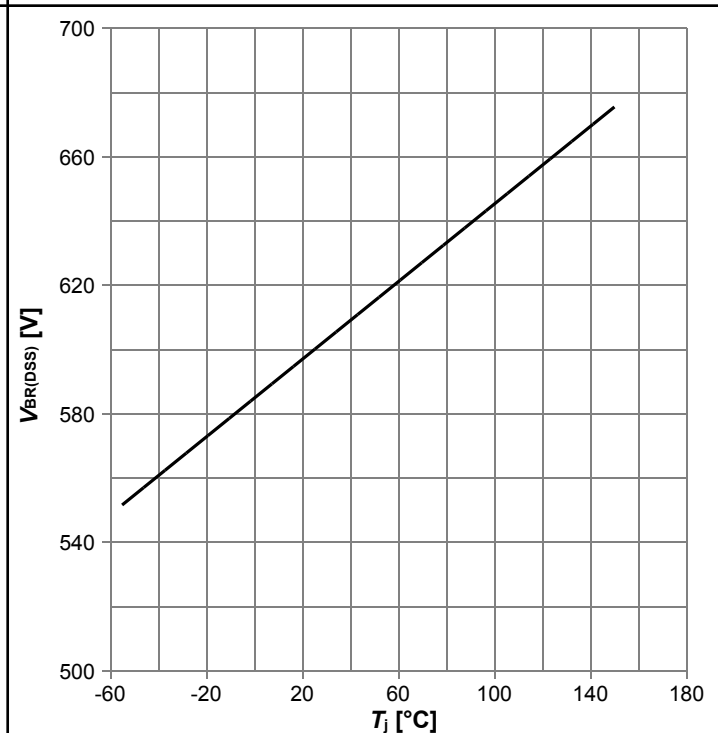
$I_F=f(V_{SD})$; parameter: T_j

Diagram 13: Typ. gate charge



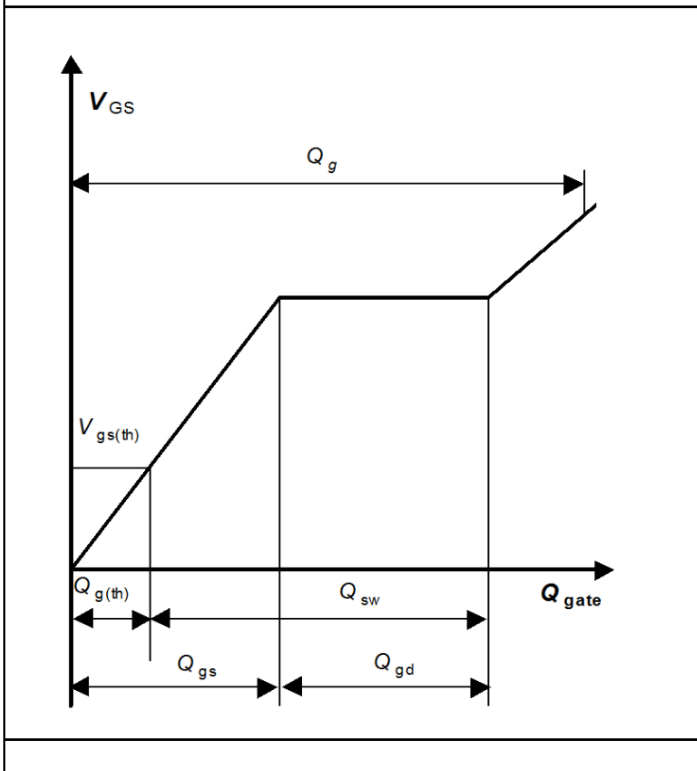
$V_{GS}=f(Q_{gate})$; $I_D=0.01$ A pulsed; parameter: V_{DD}

Diagram 14: Drain-source breakdown voltage



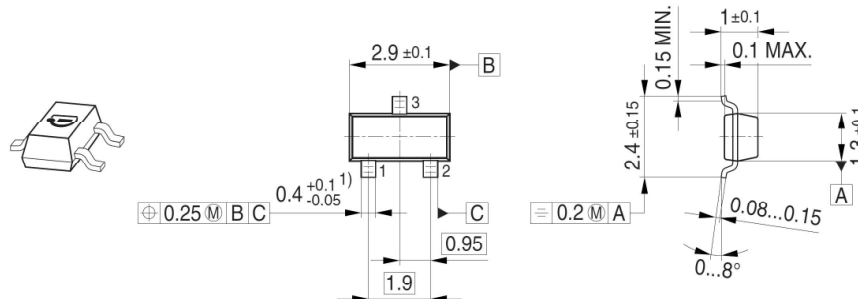
$I_D=f(V_{GS})$; $V_{GS}=-3$ V; $T_j=25$ °C

Diagram Gate charge waveforms



5 Package Outlines

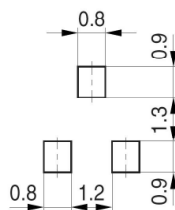
Package Outline



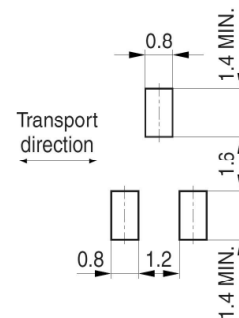
1) Lead width can be 0.6 max. in dambar area

Foot Print

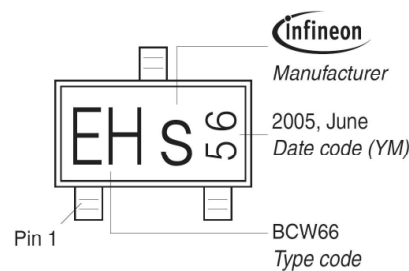
Soldering Type: Reflow Soldering



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

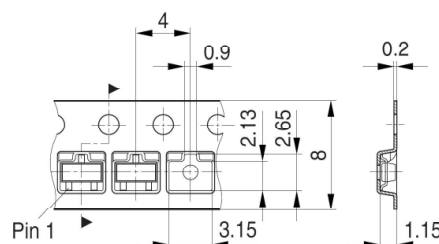


Figure 1 Outline PG-SOT23, dimensions in mm

Revision History

BSS126I

Revision: 2020-11-30, Rev. 2.1

Previous Revision

Revision	Date	Subjects (major changes since last revision)
2.0	2020-06-02	Release of final version
2.1	2020-11-30	Update Marking and typos

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