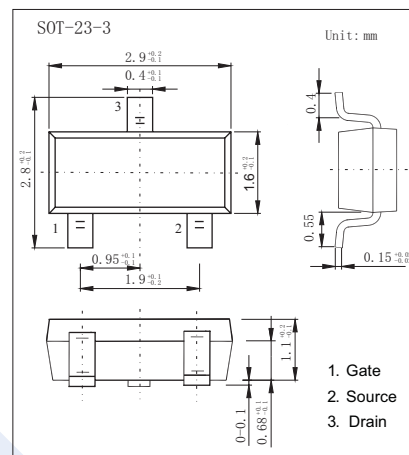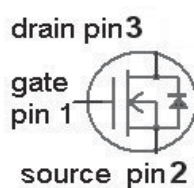# N-Channel Enhancement MOSFET

BSS127

■ Features

● N-Channel

● Enhancement mode

● Logic level

● dv/dt rated

● $V_{DS (V)}$ = 600V

● I_D = 0.021 A

● $R_{DS(ON)} <$ 500Ω

drain pin3

gate pin 1

source pin2

SOT-23-3 Unit: mm

1. Gate
2. Source
3. Drain

■ Absolute Maximum Ratings Ta = 25℃, unless otherwise specified

Parameter		Symbol	Rating	Unit
Drain-Source Voltage		V_{DS}	600	V
Gate-Source Voltage		V_{GS}	±20	
Continuous Drain Current	TA=25℃	I_D	0.021	A
	TA=70℃		0.017	
Pulsed Drain Current		I_{DM}	0.09	
Reverse diode dv/dt	I_D=0.09A, V_{DS}=480V, di/dt=200A/µs, $T_{j,max}$=150℃	dv/dt	6	kV/µs
Power Dissipation		P_{tot}	0.5	W
Thermal Resistance.Junction- to-minimal footprint		R_{thJA}	250	℃/W
Junction Temperature		T_J	150	℃
Storage Temperature Range		T_{stg}	-55 to 150	

N-Channel Enhancement MOSFET

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■ Electrical Characteristics Ta = 25℃, unless otherwise specified

| Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Drain-Source Breakdown Voltage	V_{DSS}	I_D=250µA, V_{GS}=0V	600			V
Drain-source leakage Current	$I_{D(off)}$	V_{DS}=600V, V_{GS}=0V			0.1	µA
		V_{DS}=600V, V_{GS}=0V, T_J=150℃			10	
Gate-Body Leakage Current	I_{GSS}	V_{DS}=0V, V_{GS}=±20V			±100	nA
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS}=0V , I_D=8µA	1.4		2.6	V
Static Drain-Source On-Resistance	$R_{DS(On)}$	V_{GS}=10V, I_D=0.016A			500	Ω
		V_{GS}=4.5V, I_D=0.016A			600	
Forward Transconductance	g_{FS}	$\|V_{DS}\|>2\|I_D\|R_{DS(on)max}$, I_D=0.01A	0.007			S
Input Capacitance	C_{iss}	V_{GS}=0V, V_{DS}=25V, f=1MHz		21	28	pF
Output Capacitance	C_{oss}			2.4	3	
Reverse Transfer Capacitance	C_{rss}			1.0	1.5	
Gate Source Charge	Q_{gs}	V_{DS}=400V, I_D=0.01A, V_{GS}=0 to 10V		0.05	0.08	nC
Gate Drain Charge	Q_{gd}			1.2	1.8	
Gate charge total	Q_g			1.4	2.1	
Gate plateau voltage	$V_{plateau}$			3.5		V
Turn-On DelayTime	$t_{d(on)}$	V_{GS}=10V, V_{DS}=300V, I_D=0.01A,R_{GEN}=6Ω		6.1	19.0	ns
Turn-On Rise Time	t_r			9.7	14.5	
Turn-Off DelayTime	$t_{d(off)}$			14	21	
Turn-Off Fall Time	t_f			115	170	
Body Diode Reverse Recovery Time	t_{rr}	V_R=300V, I_F= 0.016A, di_F/d_t= 100A/µs		160	240	
Body Diode Reverse Recovery Charge	Q_{rr}			13.2	19.8	nC
Maximum Body-Diode Continuous Current	I_s				0.016	A
Diode Pulse Current	$I_{S,pulse}$				0.09	
Diode Forward Voltage	V_{SD}	I_s=0.016A,V_{GS}=0V			1.2	V

■ Marking

Marking	SI

N-Channel Enhancement MOSFET
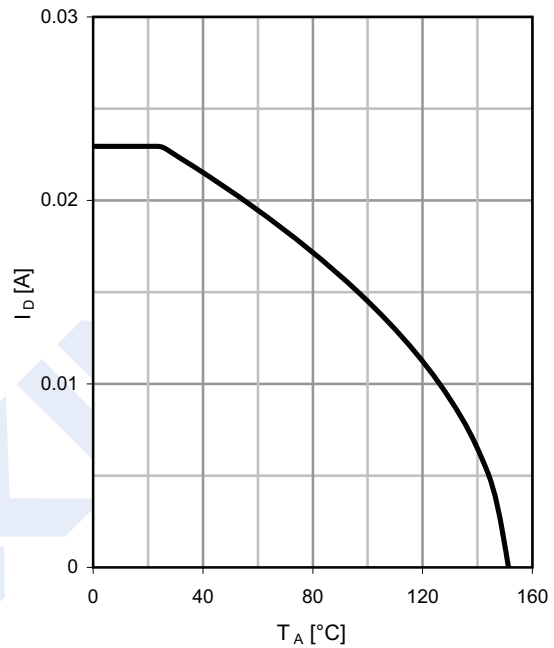
BSS127

■ Typical Characterisitics

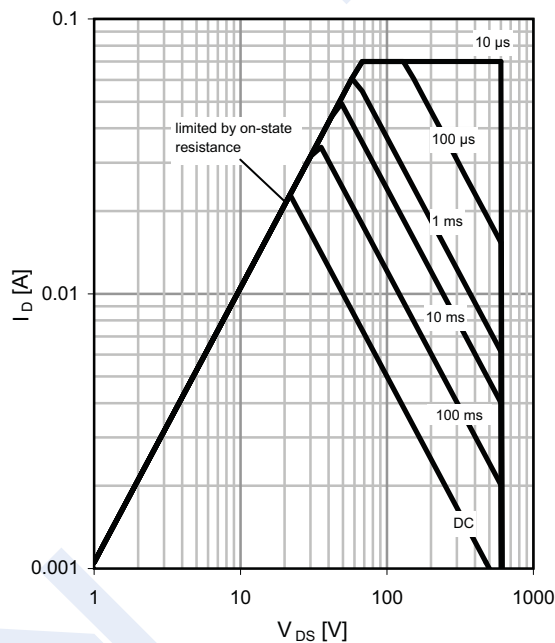### 1 Power dissipation

$P_{tot} = f(T_A)$
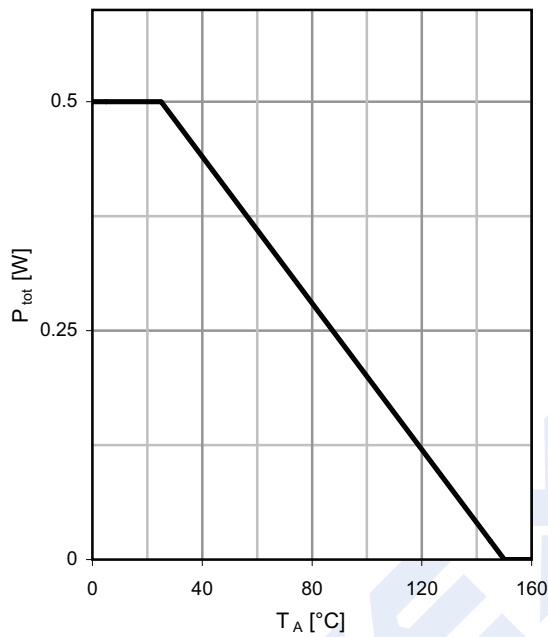
2 Drain current

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

3 Safe operating area
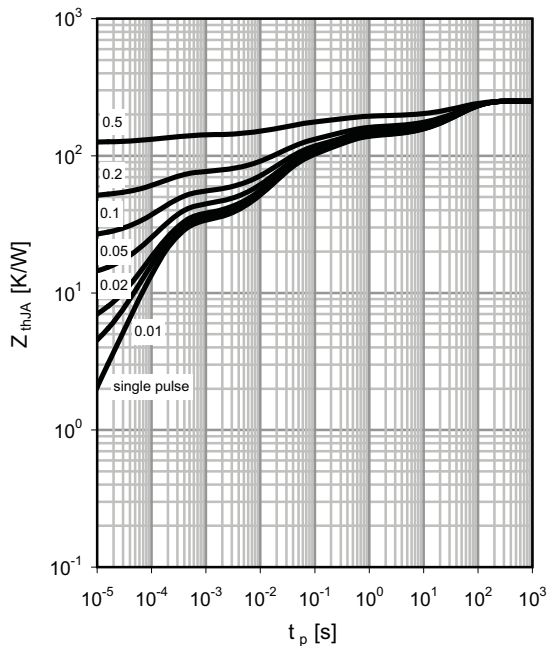
$I_D = f(V_{DS})$; $T_A = 25$ °C; $D = 0$

parameter: t_p

4 Max. transient thermal impedance
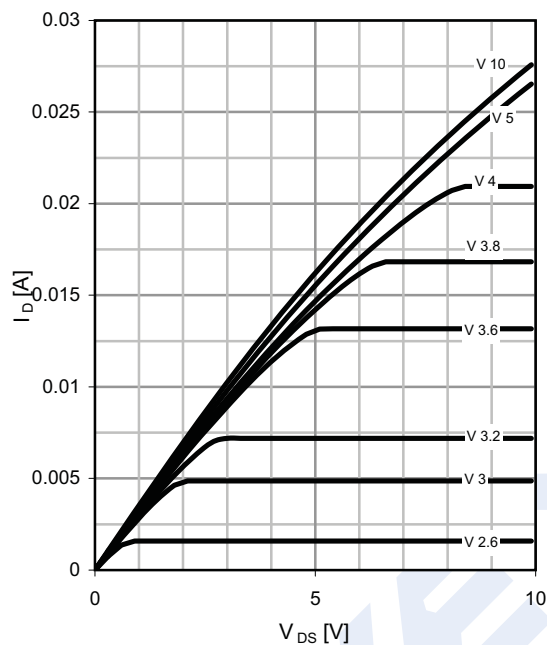
$Z_{thJA} = f(t_p)$
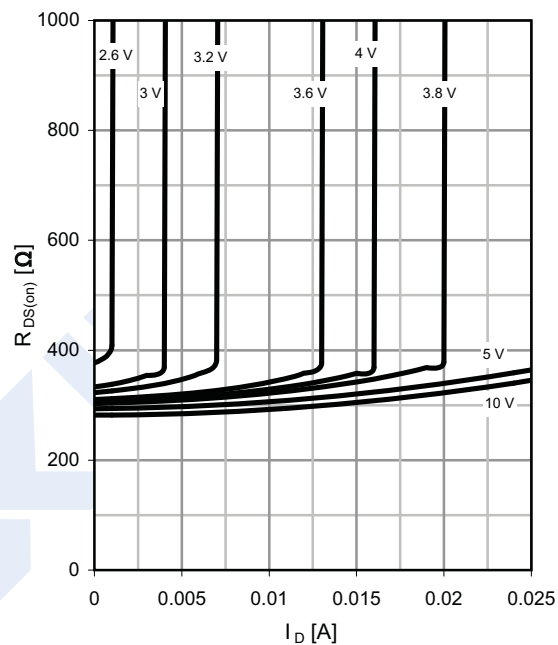
parameter: $D = t_p/T$

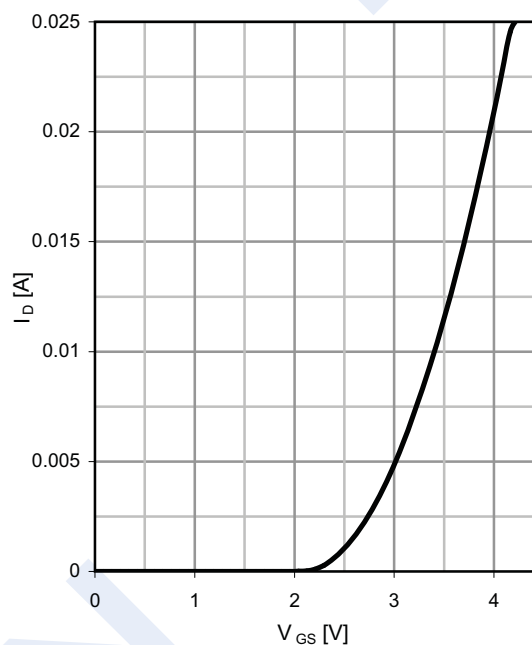# N-Channel Enhancement MOSFET

BSS127

■ Typical Characterisitics

5 Typ. output characteristics

$I_D = f(V_{DS})$; $T_j = 25$ °C

parameter: V_{GS}
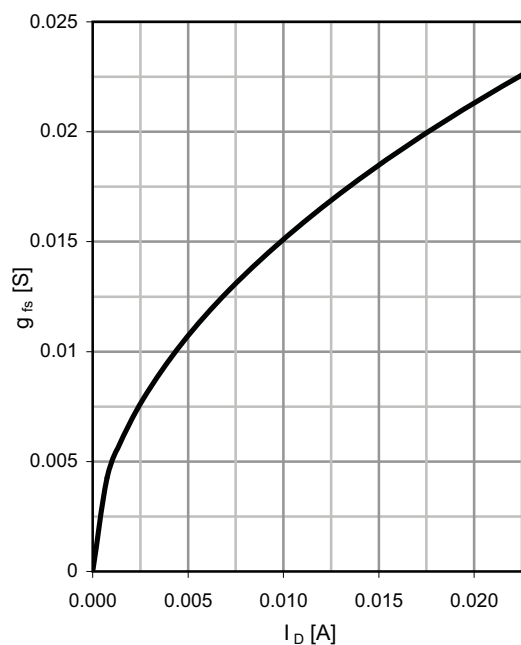
6 Typ. drain-source on resistance

$R_{DS(on)} = f(I_D)$; $T_j = 25$ °C

parameter: V_{GS}

7 Typ. transfer characteristics

$I_D = f(V_{GS})$; $|V_{DS}| > 2|I_D|R_{DS(on)max}$

8 Typ. forward transconductance

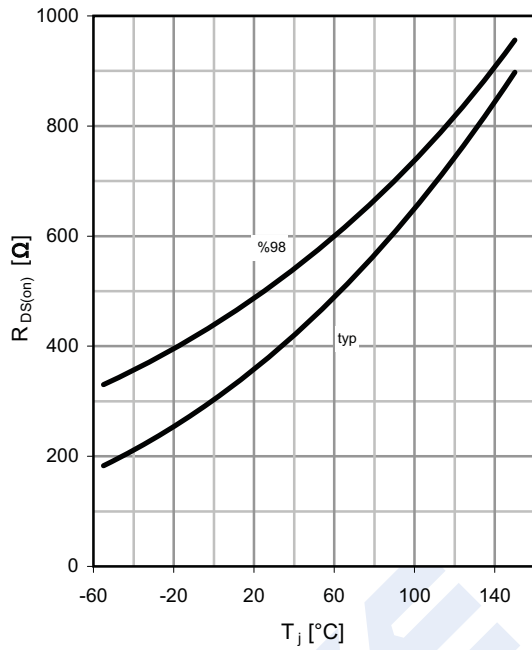$g_{fs} = f(I_D)$; $T_j = 25$ °C

N-Channel Enhancement MOSFET

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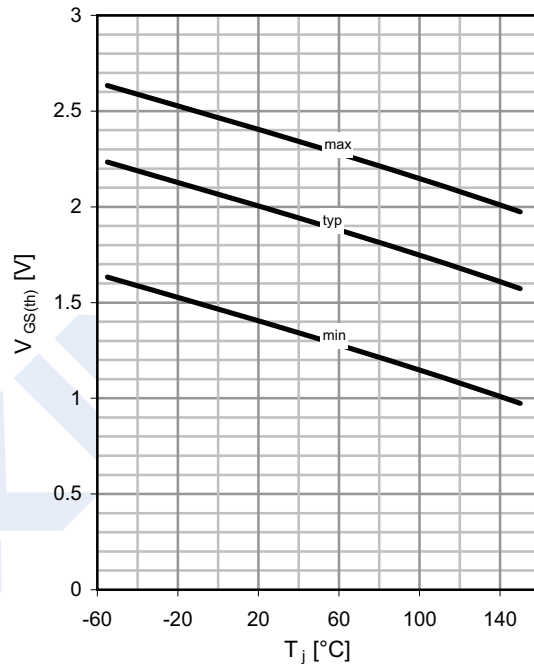■ Typical Characterisitics

9 Drain-source on-state resistance

$R_{DS(on)} = f(T_j)$; $I_D = 0.1$ A; $V_{GS} = 10$ V
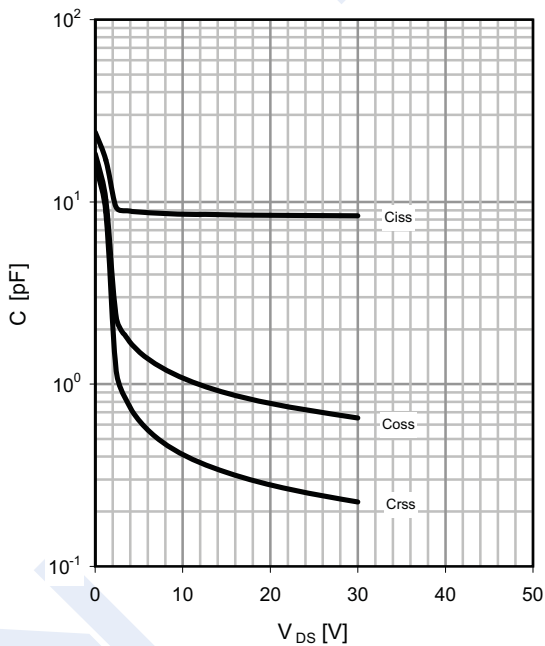

10 Typ. gate threshold voltage

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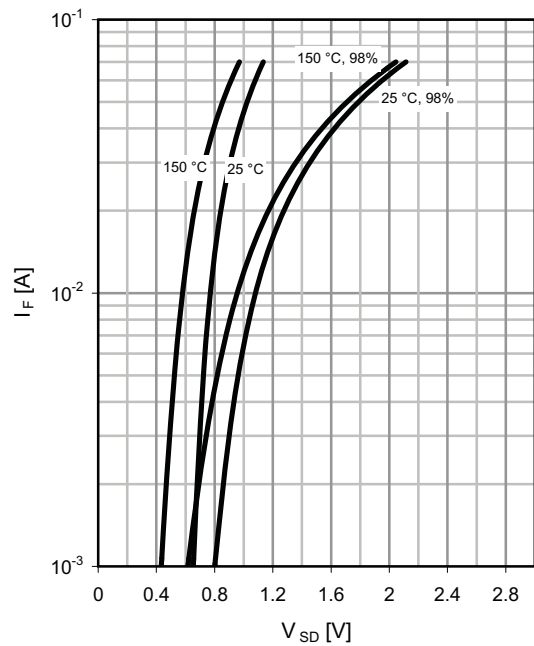
parameter: I_D

11 Typ. capacitances

$C = f(V_{DS})$; $V_{GS} = 0$ V; $f = 1$ MHz; $T_j = 25°C$

12 Forward characteristics of reverse diode
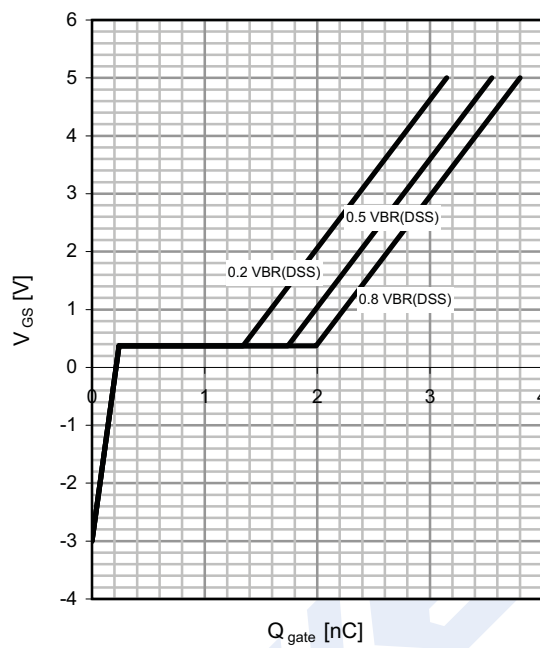
$I_F = f(V_{SD})$

parameter: T_j

N-Channel Enhancement MOSFET

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■ Typical Characterisitics

13 Typ. gate charge

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

parameter: V_{DD}

14 Drain-source breakdown voltage

$V_{BR(DSS)}=f(T_j)$; I_D=250 µA

KEXIN