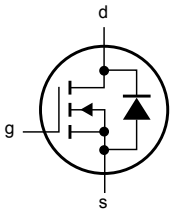
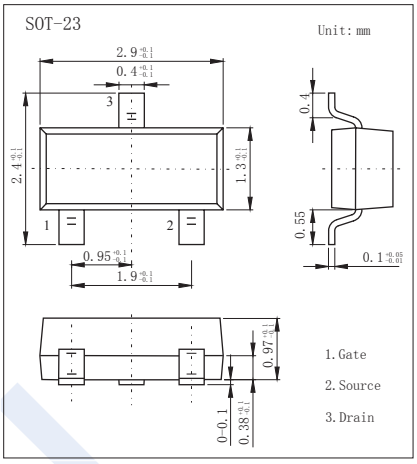
N-Channel MOSFET
BSN20

■ Features

- TrenchMOS™ technology
- Very fast switching
- Logic level compatible
- Subminiature surface mount package.





■ Absolute Maximum Ratings Ta = 25℃

Parameter	Symbol	Rating	Unit
Drain-source voltage	V_{DS}	50	V
Gate-Source Voltage	V_{GS}	±20	
Continuous Drain Current Ta = 25℃	I_D	173	mA
Continuous Drain Current Ta = 100℃		110	
Pulsed Drain Current	I_{DM}	700	
Power dissipation TA = 25℃	P_D	0.83	W
Maximum Junction-to-Ambient	R_{thJA}	350	K/W
Thermal resistance from junction to solder point	R_{thJP}	150	
Operating and storage junction temperature range	T_J, T_{stg}	- 65+150	℃

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■ Electrical Characteristics Ta = 25℃

Parameter	Symbol	Testconditons	Min	Typ	Max	Unit
Drain-source breakdown voltage	$V_{(BR)DSS}$	V_{GS}=0 V, I_D=10 μA	50			V
Gate-threshold voltage	$V_{GS(th)}$	V_{DS}=V_{GS}, I_D=1 mA	0.4	1.5	2	
Gate-body leakage	I_{GSS}	V_{DS}=0 V, V_{GS}= ±20 V			±100	nA
Zero gate voltage drain current	I_{DSS}	V_{DS}=40 V, V_{GS}=0 V			1	uA
		V_{DS}=40 V, V_{GS}=0 V, Ta = 150℃			10	
Drain-source on-resistance	$R_{DS(0n)}$	V_{GS}=10 V, I_D=100 mA		2.8	15	Ω
		V_{GS}=5 V, I_D=100 mA		3.8	20	
Forward tran conductance	g_{fs}	V_{DS}=10 V, I_D=100 mA	40	170		ms
Input capacitance	C_{iss}	V_{DS}=10 V, V_{GS}=0 V, f=1 MHz		17	25	pF
Output capacitance	C_{OSS}			7	15	
Reverse transfer capacitance	C_{rSS}			4	8	
Turn-on Time	$t_{d(0n)}$	V_{DD}=20 V, R_D=180Ω R_{GS}=50 Ω,V_{GS}=10 V R_G=50Ω		1.7	8	ns
Turn-off Time	$t_{d(off)}$			8	15	
Reverse recovery time	trr	I_S=180mA;dI/dt=100A/μs;V_{GS}=0V; V_{DS}=25V		30		
Recovered charge	Qrr			30		nC
Diode forward voltage	V_{SD}	I_S=180 mA, V_{GS}=0 V		0.9	1.5	V

■ Marking

Marking	702.

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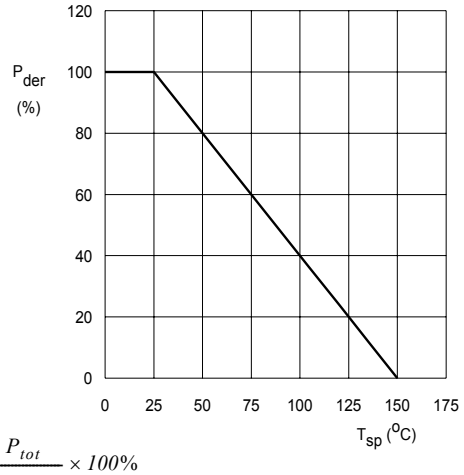
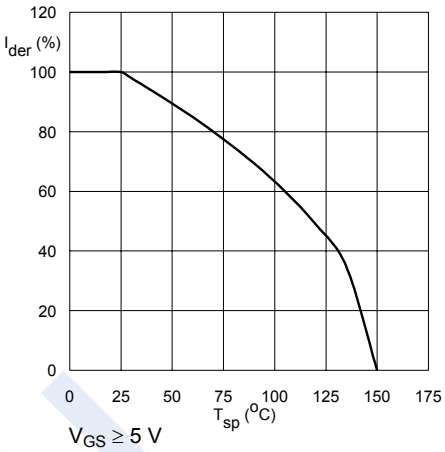
■ Typical Characteristics



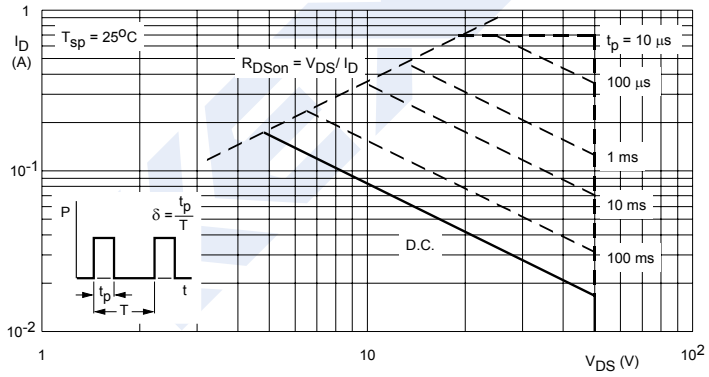
$$P_{der} = \frac{P_{tot}}{P_{tot(25°C)}} \times 100\%$$

Fig 1. Normalized total power dissipation as a function of solder point temperature.



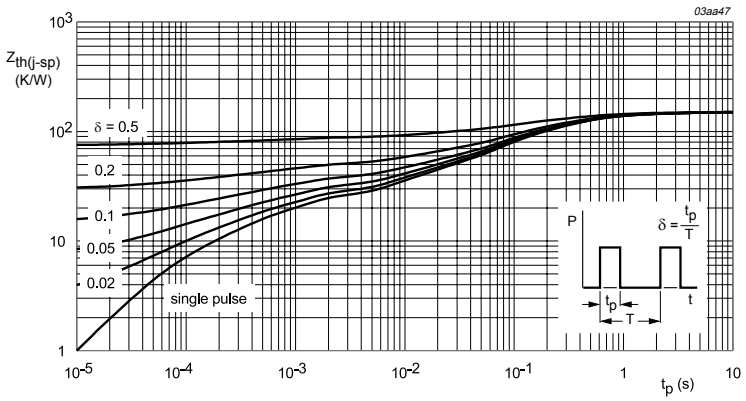
$$I_{der} = \frac{I_D}{I_{D(25°C)}} \times 100\%$$

Fig 2. Normalized continuous drain current as a function of solder point temperature.



T_{sp} = 25 °C; I_{DM} is single pulse.

Fig 3. Safe operating area; continuous and peak drain currents as a function of drain-source voltage.



Mounted on a metal clad substrate.

Fig 4. Transient thermal impedance from junction to solder point as a function of pulse duration.

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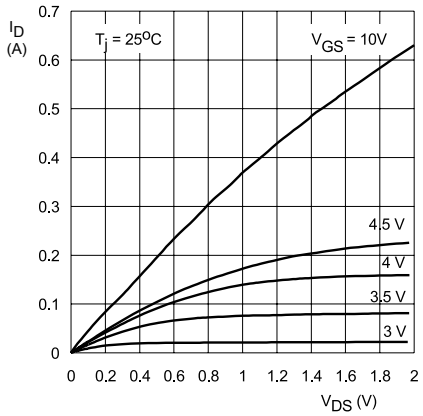
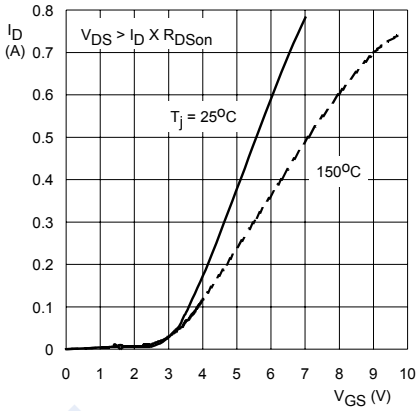
■ Typical Characterisitics



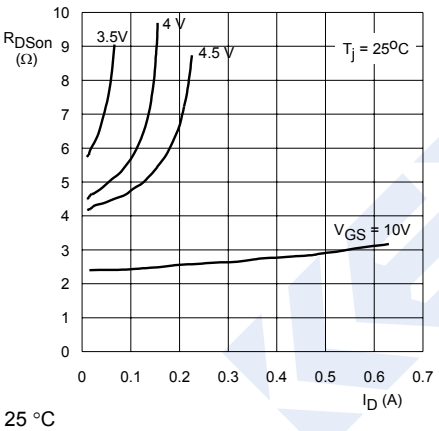
T_j = 25 °C

Fig 5. Output characteristics: drain current as a function of drain-source voltage; typical values.



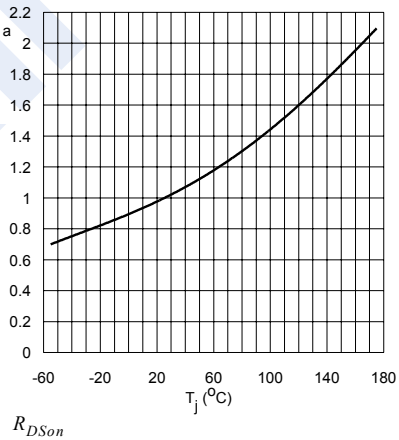
T_j = 25 °C and 150 °C; $V_{DS} \geq I_D \times R_{DSon}$

Fig 6. Transfer characteristics: drain current as a function of gate-source voltage; typical values.



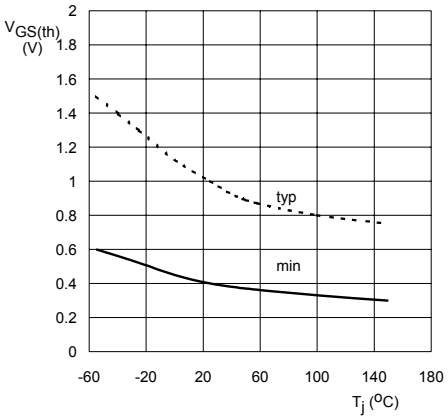
T_j = 25 °C

Fig 7. Drain-source on-state resistance as a function of drain current; typical values.



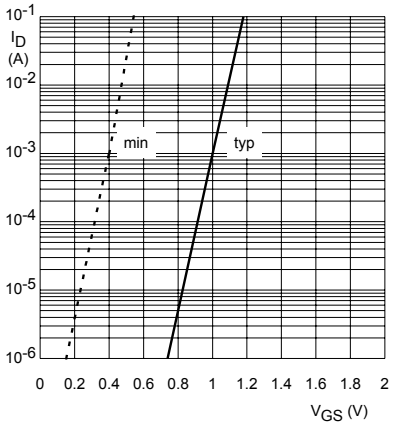
$$a = \frac{R_{DSon}}{R_{DSon(25°C)}}$$

Fig 8. Normalized drain-source on-state resistance factor as a function of junction temperature.



I_D = 1 mA; $V_{DS} = V_{GS}$

Fig 9. Gate-source threshold voltage as a function of junction temperature.



T_j = 25 °C; V_{DS} = 5 V

Fig 10. Sub-threshold drain current as a function of gate-source voltage.

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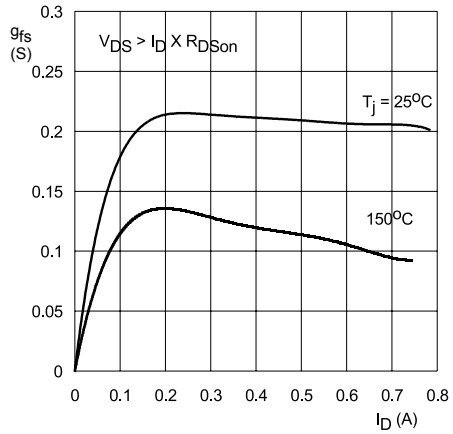
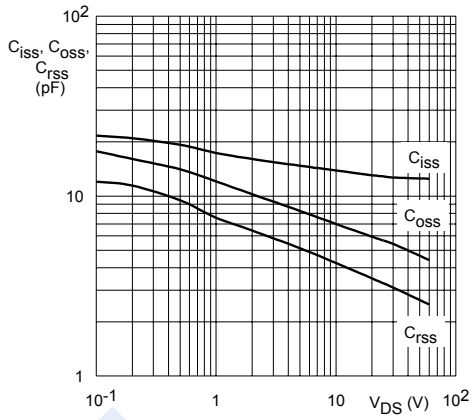
■ Typical Characterisitics



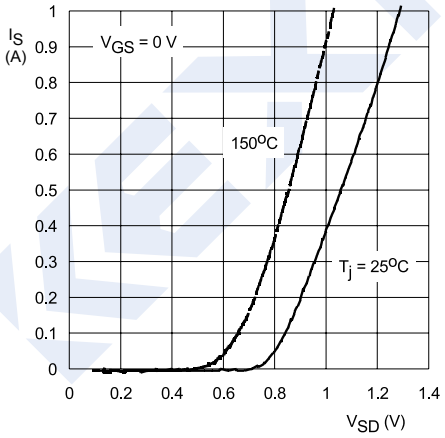
T_j = 25 °C and 150 °C; $V_{DS} \geq I_D \times R_{DSon}$

Fig 11. Forward transconductance as a function of drain current; typical values.



V_{GS} = 0 V; f = 1 MHz

Fig 12. Input, output and reverse transfer capacitances as a function of drain-source voltage; typical values.



T_j = 25 °C and 150 °C; V_{GS} = 0 V

Fig 13. Source (diode forward) current as a function of source-drain (diode forward) voltage; typical values.