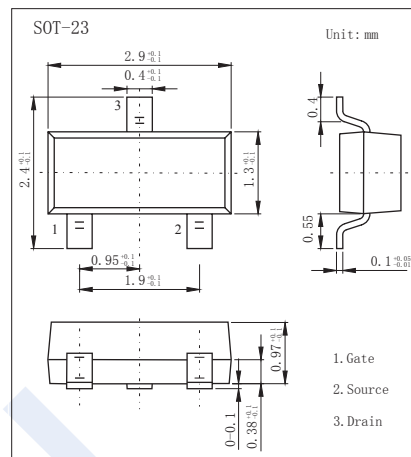
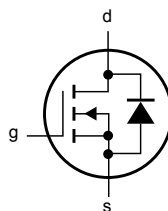


N-Channel MOSFET

BSN20

■ Features

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



■ Absolute Maximum Ratings $T_a = 25^\circ\text{C}$

Parameter	Symbol	Rating	Unit
Drain-source voltage	V_{DS}	50	V
Gate-Source Voltage	V_{GS}	± 20	
Continuous Drain Current	I_D	173	mA
		110	
Pulsed Drain Current	I_{DM}	700	
Power dissipation	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	$^\circ\text{C}$

N-Channel MOSFET

BSN20

■ Electrical Characteristics Ta = 25℃

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

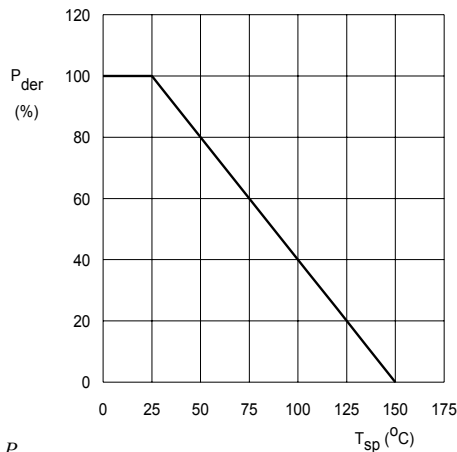
■ Marking

Marking	702.
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N-Channel MOSFET

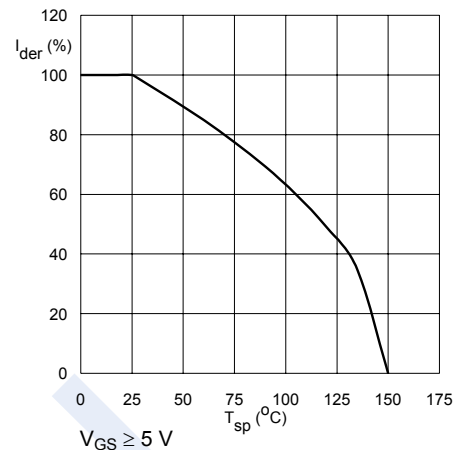
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Typical Characteristics



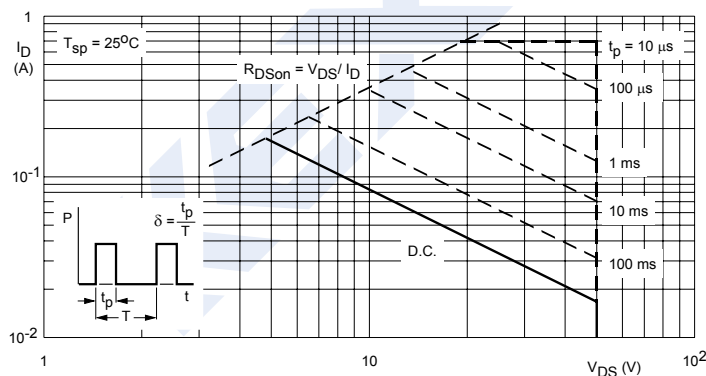
$$P_{der} = \frac{P_{tot}}{P_{tot(25^{\circ}\text{C})}} \times 100\%$$

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



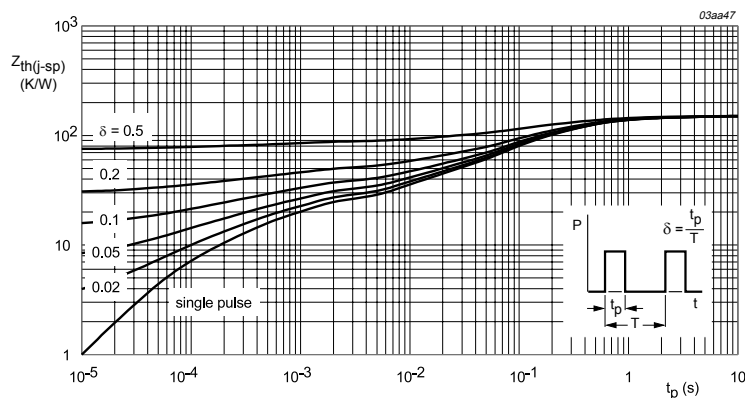
$$I_{der} = \frac{I_D}{I_{D(25^{\circ}\text{C})}} \times 100\%$$

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



$T_{sp} = 25^{\circ}\text{C}$; I_{DM} is single pulse.

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



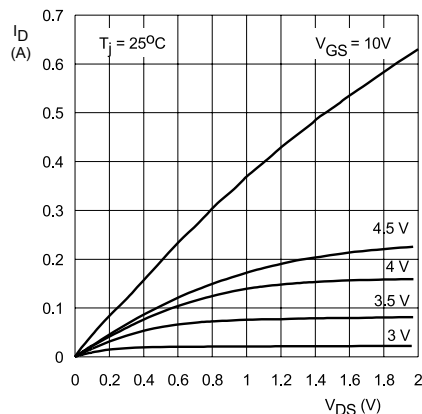
Mounted on a metal clad substrate.

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

N-Channel MOSFET

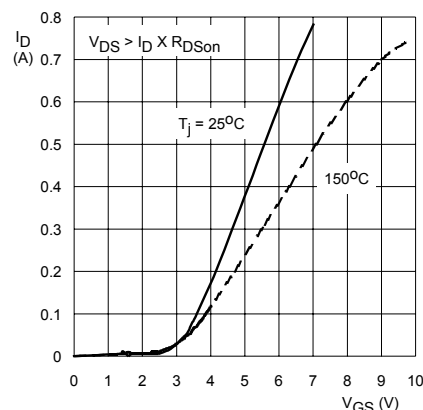
BSN20

■ Typical Characteristics



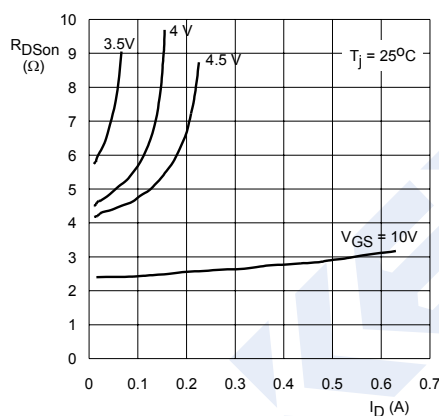
$T_j = 25^\circ\text{C}$

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



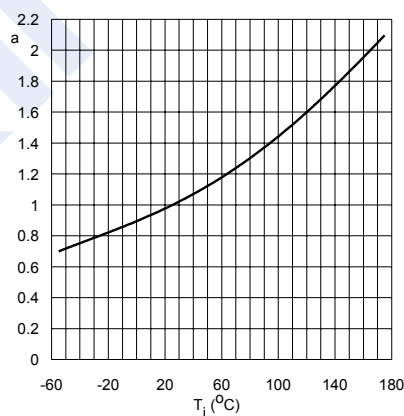
$T_j = 25^\circ\text{C}$ and 150°C ; $V_{DS} \geq I_D \times R_{DS(on)}$

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



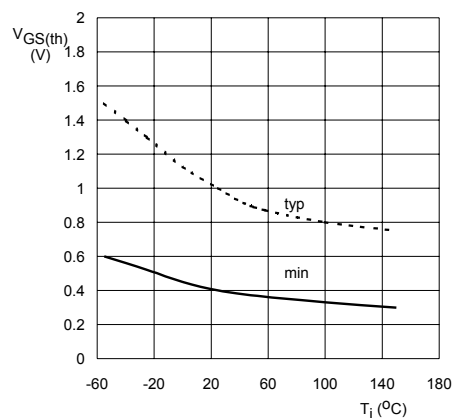
$T_j = 25^\circ\text{C}$

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



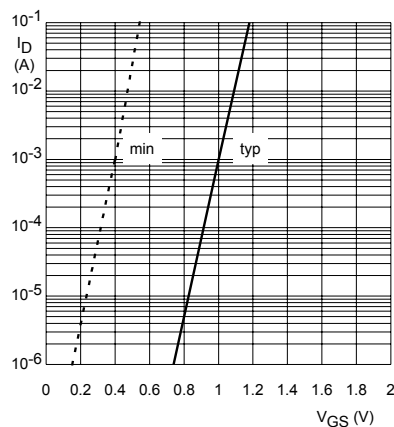
$$a = \frac{R_{DS(on)}}{R_{DS(on)}(25^\circ\text{C})}$$

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



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

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



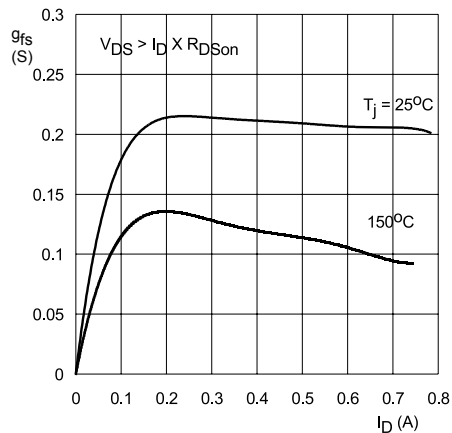
$T_j = 25^\circ\text{C}$; $V_{DS} = 5\text{ V}$

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

N-Channel MOSFET

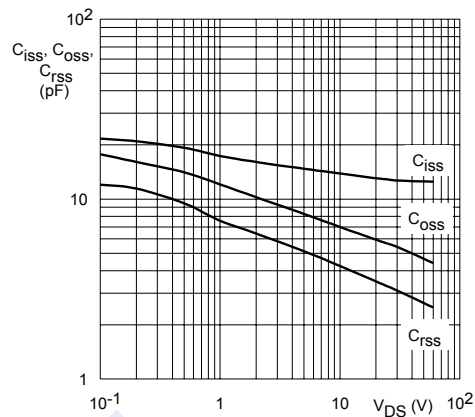
BSN20

■ Typical Characteristics



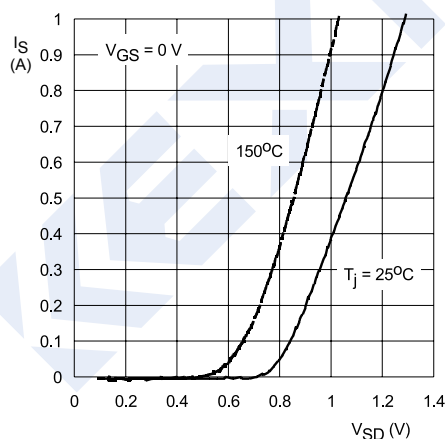
$T_j = 25^\circ\text{C}$ and 150°C ; $V_{DS} \geq I_D \times R_{DSon}$

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



$V_{GS} = 0\text{ V}$; $f = 1\text{ MHz}$

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



$T_j = 25^\circ\text{C}$ and 150°C ; $V_{GS} = 0\text{ V}$

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