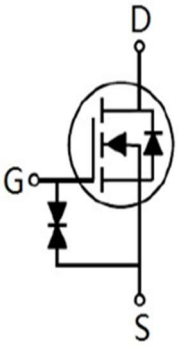
DN8B20KC
20V/0.8A N Channel Small Signal MOSFET

General description
20V/0.8A N Channel Small Signal MOSFET

Features:
- Low RDS(on) @VGS=4.5V
- 2.5V Logic Level Control
- N Channel SOT-883 Package
- ESD Protection
- Pb−Free, RoHS Compliant

Applications
- LED Lighting Application,
- ON/OFF switch
- Networking



SOT-883

$V_{(BR)DSS}$	$R_{DS(ON)}$ Typ	I_D Max
20V	200mΩ @4.5V	0.8A
	220mΩ @ 3.3V	

Absolute Maximum Ratings (TA=25℃unless otherwise noted)

Symbol	Parameter		Rating	Unit
Common Ratings (T_A=25°C Unless Otherwise Noted)				
V_{GS}	Gate-Source Voltage		±8	V
$V_{(BR)DSS}$	Drain-Source Breakdown Voltage		20	V
T_J	Maximum Junction Temperature		150	°C
T_{STG}	Storage Temperature Range		-50 to 150	°C
Mounted on Large Heat Sink				
I_{DM}	Pulse Drain Current Tested①	T_A=25°C	3.2	A
I_D	Continuous Drain Current	T_A=25°C	0.8	A
		T_A=70°C	0.65	
P_D	Maximum Power Dissipation	T_A=25°C	0.3	W
		T_A=70°C	0.2	
R_{JA}	Thermal Resistance Junction-Ambient		400	°C/W

Symbol	Parameter	Condition	Min	Typ	Max	Unit
Static Electrical Characteristics @ T_J = 25°C (unless otherwise stated)						
$V_{(BR)DSS}$	Drain-Source Breakdown Voltage	V_{GS}=0V I_D=250μA	20	--	--	V
I_{DSS}	Zero Gate Voltage Drain Current(T_A=25℃)	V_{DS}=20V, V_{GS}=0V	--	--	1	μA
	Zero Gate Voltage Drain Current(T_A=125℃)	V_{DS}=16V, V_{GS}=0V	--	--	100	uA
I_{GSS}	Gate-Body Leakage Current	V_{GS}=±8V, V_{DS}=0V	--	--	±10	uA
$V_{GS(TH)}$	Gate Threshold Voltage	V_{DS}=V_{GS}, I_D=250μA	0.35	0.6	1.0	V
$R_{DS(ON)}$	Drain-Source On-State Resistance②	V_{GS}=4.5V, I_D=0.5A	--	200	300	mΩ
$R_{DS(ON)}$	Drain-Source On-State Resistance②	V_{GS}=3.3V, I_D=0.3A	--	220	350	mΩ
$R_{DS(ON)}$	Drain-Source On-State Resistance②	V_{GS}=2.5V, I_D=0.2A	--	250	400	mΩ
Dynamic Electrical Characteristics @ T_J = 25°C (unless otherwise stated)						
C_{iss}	Input Capacitance	V_{DS}=10V, V_{GS}=0V, f=1MHz	--	36	--	pF
C_{oss}	Output Capacitance		--	9.3	--	pF
C_{rss}	Reverse Transfer Capacitance		--	6.8	--	pF
Q_g	Total Gate Charge	V_{DS}=10V I_D=0.5A, V_{GS}=4.5V	--	0.8	--	nC
Q_{gs}	Gate Source Charge		--	0.11	--	nC
Q_{gd}	Gate Drain Charge		--	0.18	--	nC
Switching Characteristics						
$t_{d(on)}$	Turn on Delay Time	V_{DD}=10V, I_D=0.5A, R_G=3.3Ω, V_{GS}=4.5V	--	7	--	ns
t_r	Turn on Rise Time		--	10	--	ns
$t_{d(off)}$	Turn Off Delay Time		-	35	--	ns
t_f	Turn Off Fall Time		--	14	--	ns
Source Drain Diode Characteristics						
I_{SD}	Source drain current(Body Diode)	T_A=25℃	--	--	0.5	A
V_{SD}	Forward on voltage②	T_j=25℃, I_{SD}=0.3A, V_{GS}=0V	--	0.74	1.2	V

Notes:

① **Pulse width limited by maximum allowable junction temperature**

② **Pulse test ; Pulse width≤300μs, duty cycle≤2%**

Typical Characteristics

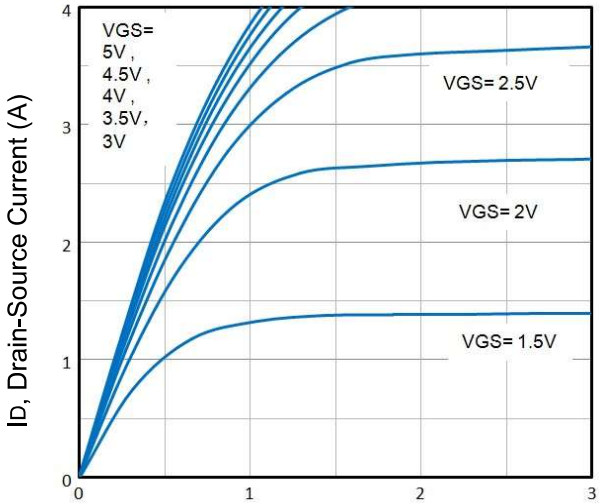


Fig1. Typical Output Characteristics

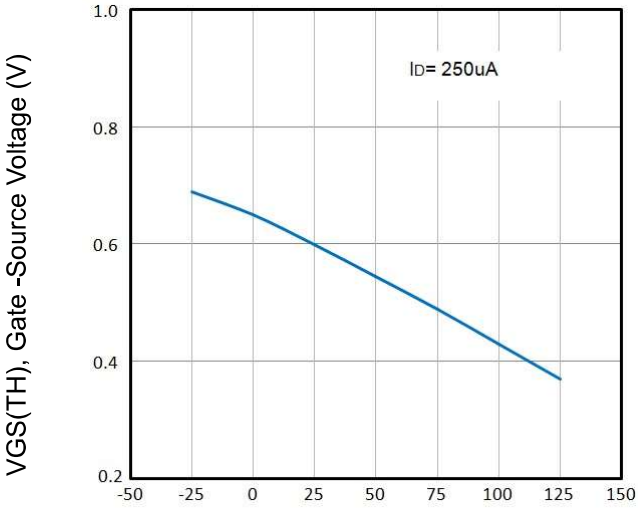


Fig2. Normalized Threshold Voltage Vs. Temperature

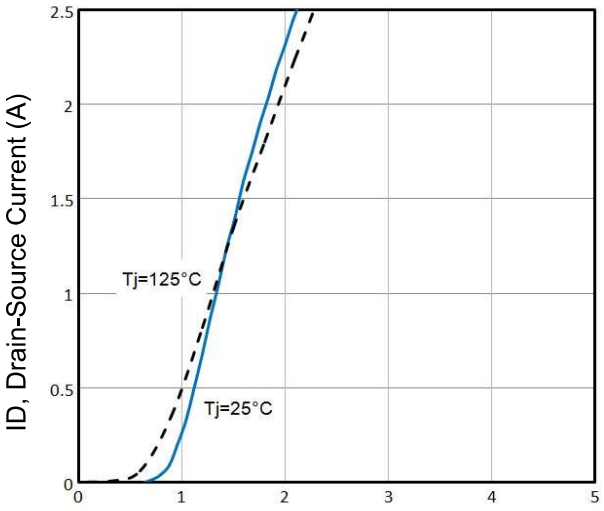


Fig3. Typical Transfer Characteristics

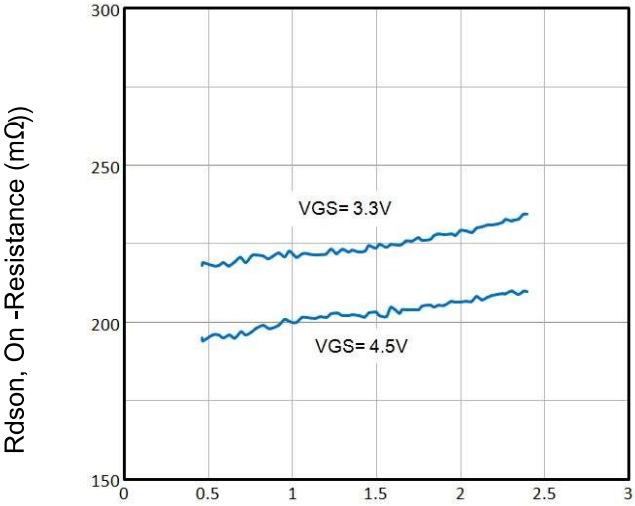


Fig4. On-Resistance vs. Drain Current and Gate

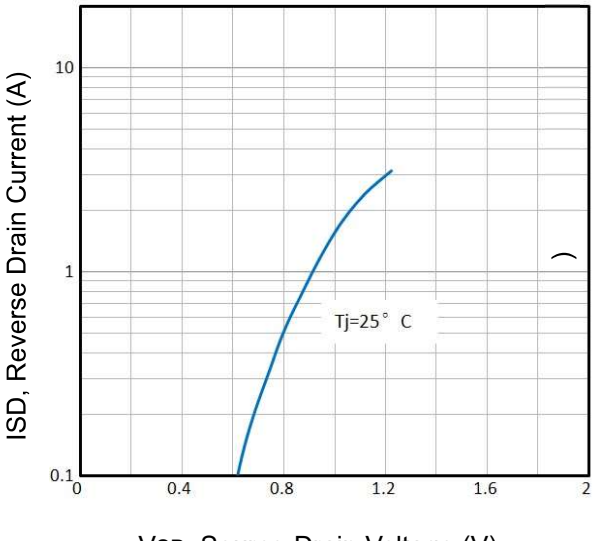


Fig5. Typical Source-Drain Diode Forward Voltage

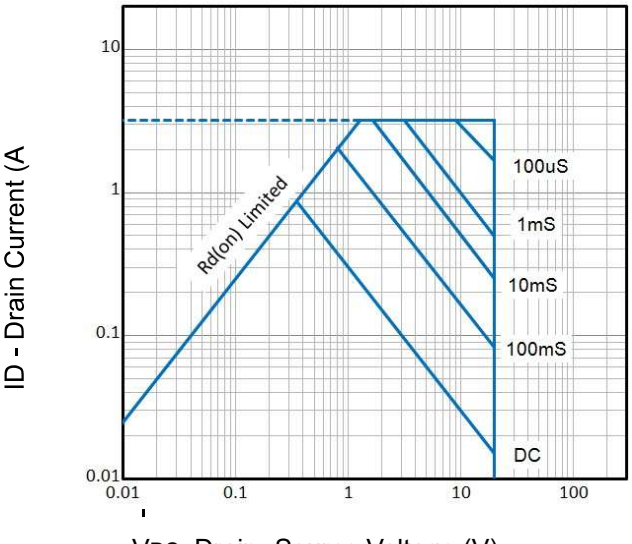


Fig6. Maximum Safe Operating Area

Typical Characteristics

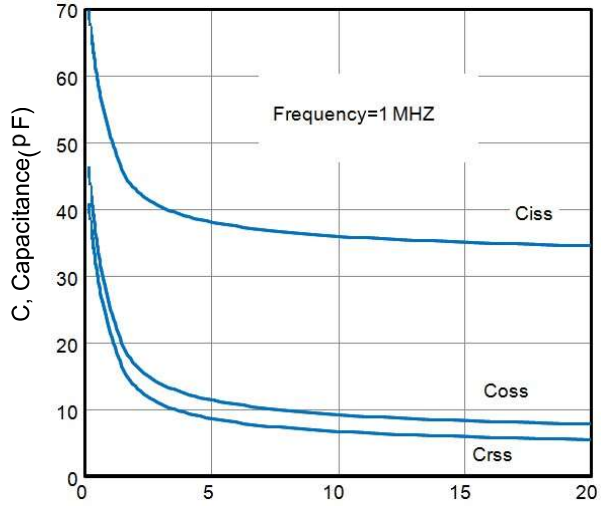


Fig7. Typical Capacitance Vs. Drain-Source Voltage

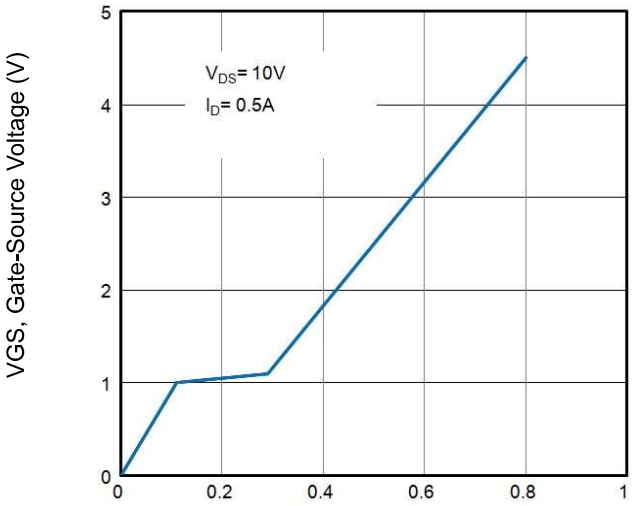


Fig8. Typical Gate Charge Vs. Gate-Source Voltage

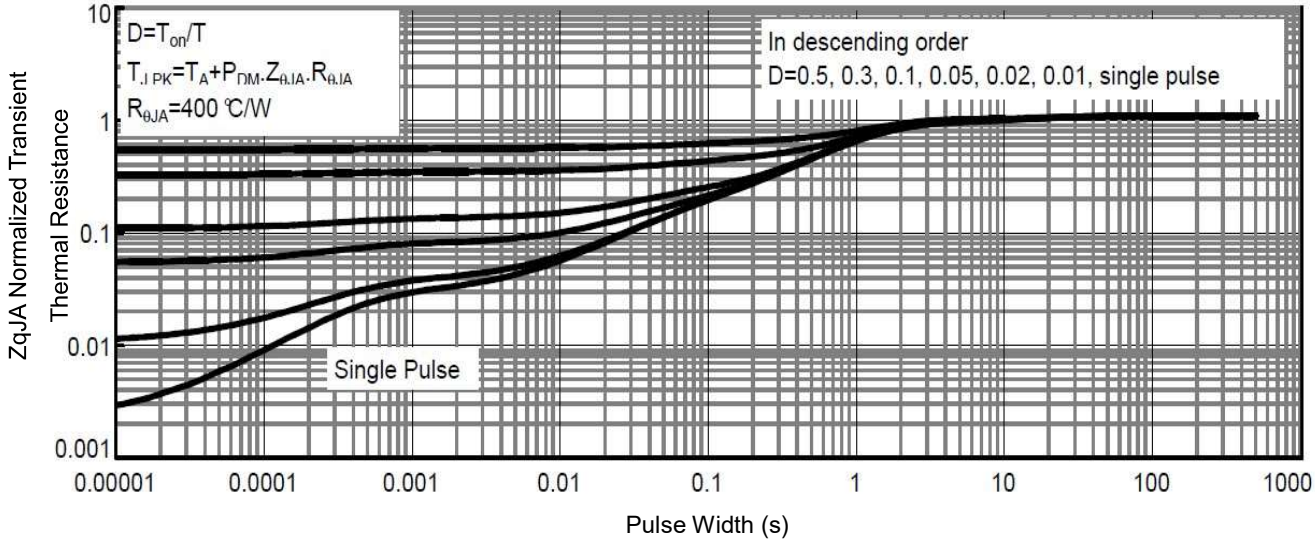


Fig9. Normalized Maximum Transient Thermal Impedance

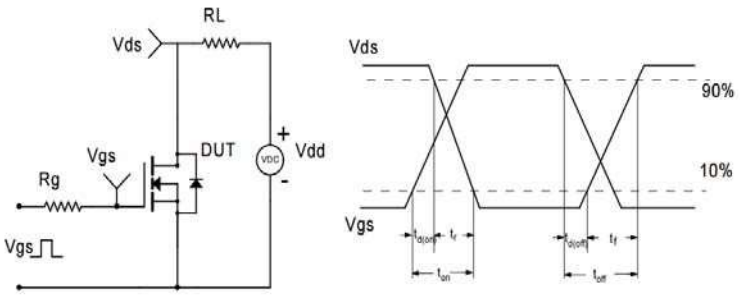
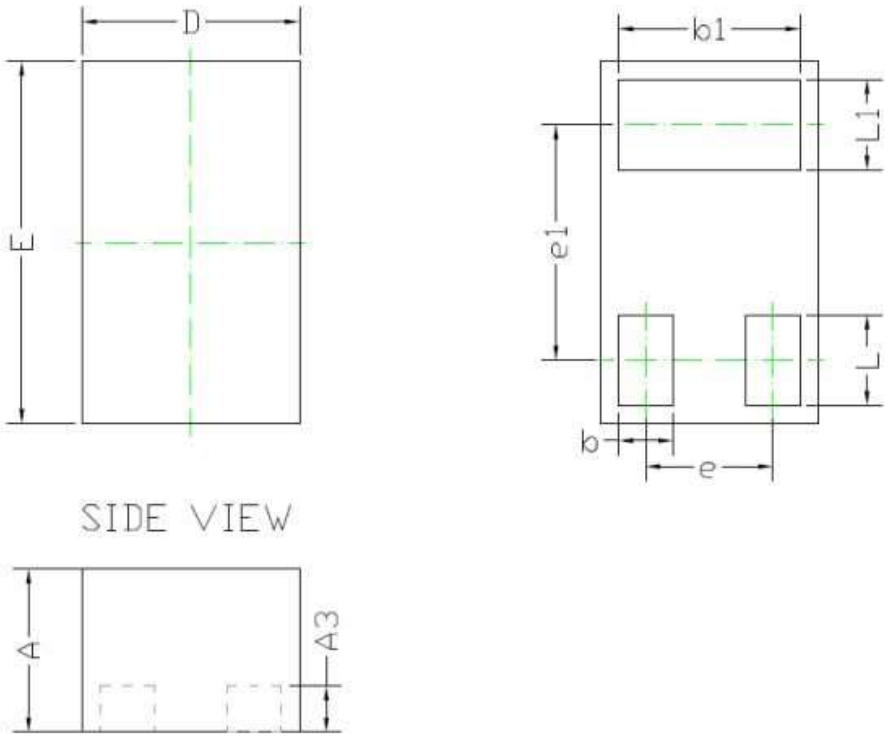


Fig10. Switching Time Test Circuit and waveforms

SOT-883 Package outline



SYMBOL	COMMON DIMENSIONS MILLIMETER		
	MIN	NOM.	MAX
A	0.40	0.45	0.50
A3	0.127 BSC		
D	0.55	0.60	0.65
E	0.95	1.00	1.05
e	0.35 BSC		
e1	0.65 BSC		
b	0.13	0.15	0.18
b1	0.45	0.50	0.55
L	0.20	0.25	0.30
L1	0.20	0.25	0.30

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