

# DP6B20KC

## DP6B20KC -20V/-0.6A P Channel Small Signal MOSFET

### General description

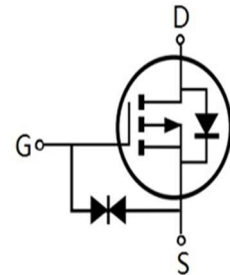
-20V/-0.6A P Channel Small Signal MOSFET

#### Features:

- Low RDS(on) @VGS=-4.5V
- -3.3V Logic Level Control
- P Channel SOT-883 Package
- ESD Protection
- Pb-Free, RoHS Compliant

#### Applications

- High-side Load Switch• Switching Circuits
- High Speed line Driver
- Relay Driver



### SOT-883

V <sub>(BR)DSS</sub>	R <sub>DS(ON)</sub> Typ	I <sub>D</sub> Max
-20V	510mΩ @ 4.5V	-0.6A
	570mΩ @ 3.3V	

### Absolute Maximum Ratings (TA=25°C unless otherwise noted)

Symbol	Parameter	Rating	Unit	
<b>Common Ratings (TA=25°C Unless Otherwise Noted)</b>				
V <sub>GS</sub>	Gate-Source Voltage	±8	V	
V <sub>(BR)DSS</sub>	Drain-Source Breakdown Voltage	-20	V	
T <sub>J</sub>	Maximum Junction Temperature	150	°C	
T <sub>STG</sub>	Storage Temperature Range	-50 to 150	°C	
<b>Mounted on Large Heat Sink</b>				
I <sub>DM</sub>	Pulse Drain Current Tested①	T <sub>A</sub> =25°C	-2.4	A
I <sub>D</sub>	Continuous Drain Current	T <sub>A</sub> =25°C	-0.6	A
		T <sub>A</sub> =70°C	-0.48	
P <sub>D</sub>	Maximum Power Dissipation	T <sub>A</sub> =25°C	0.3	W
		T <sub>A</sub> =70°C	0.24	
R <sub>JA</sub>	Thermal Resistance Junction-Ambient	400	°C/W	

# DP6B20KC

Symbol	Parameter	Condition	Min	Typ	Max	Unit
<b>Static Electrical Characteristics @ T<sub>J</sub> = 25°C (unless otherwise stated)</b>						
V <sub>(BR)DSS</sub>	Drain-Source Breakdown Voltage	V <sub>GS</sub> =0V I <sub>D</sub> =-250μA	-20	--	--	V
I <sub>DSS</sub>	Zero Gate Voltage Drain Current(T <sub>A</sub> =25°C)	V <sub>DS</sub> =-20V, V <sub>GS</sub> =0V	--	--	-1	μA
	Zero Gate Voltage Drain Current(T <sub>A</sub> =125°C)	V <sub>DS</sub> =-16V, V <sub>GS</sub> =0V	--	--	-100	uA
I <sub>GSS</sub>	Gate-Body Leakage Current	V <sub>GS</sub> =±8V, V <sub>DS</sub> =0V	--	--	±10	uA
V <sub>GS(TH)</sub>	Gate Threshold Voltage	V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> =-250μA	-0.35	-0.6	-1.0	V
R <sub>DS(ON)</sub>	Drain-Source On-State Resistance <sup>②</sup>	V <sub>GS</sub> =-4.5V, I <sub>D</sub> =-0.5A	--	510	650	mΩ
R <sub>DS(ON)</sub>	Drain-Source On-State Resistance <sup>②</sup>	V <sub>GS</sub> =-3.3V, I <sub>D</sub> =-0.3A	--	570	700	mΩ
R <sub>DS(ON)</sub>	Drain-Source On-State Resistance <sup>②</sup>	V <sub>GS</sub> =-2.5V, I <sub>D</sub> =-0.1A	--	600	800	mΩ
<b>Dynamic Electrical Characteristics @ T<sub>J</sub> = 25°C (unless otherwise stated)</b>						
C <sub>iss</sub>	Input Capacitance	V <sub>DS</sub> =-10V, V <sub>GS</sub> =0V, f=1MHz	--	39	--	pF
C <sub>oss</sub>	Output Capacitance		--	6.4	--	pF
C <sub>rss</sub>	Reverse Transfer Capacitance		--	4.2	--	pF
Q <sub>g</sub>	Total Gate Charge	V <sub>DS</sub> =-10V I <sub>D</sub> =-0.5A, V <sub>GS</sub> =-4.5V	--	1.1	--	nC
Q <sub>gs</sub>	Gate Source Charge		--	0.1	--	nC
Q <sub>gd</sub>	Gate Drain Charge		--	0.3	--	nC
<b>Switching Characteristics</b>						
t <sub>d(on)</sub>	Turn on Delay Time	V <sub>DD</sub> =-10V, I <sub>D</sub> =-0.5A, R <sub>G</sub> =3.3Ω, V <sub>GS</sub> =-4.5V	--	16	--	ns
t <sub>r</sub>	Turn on Rise Time		--	32	--	ns
t <sub>d(off)</sub>	Turn Off Delay Time		-	85	--	ns
t <sub>f</sub>	Turn Off Fall Time		--	68	--	ns
<b>Source Drain Diode Characteristics</b>						
I <sub>SD</sub>	Source drain current(Body Diode)	T <sub>A</sub> =25°C	--	--	-0.3	A
V <sub>SD</sub>	Forward on voltage <sup>②</sup>	T <sub>J</sub> =25°C, I <sub>SD</sub> =-0.3A, V <sub>GS</sub> =0V	--	-0.89	-1.2	V

**Notes:**

- ① Pulse width limited by maximum allowable junction temperature
- ② Pulse test ; Pulse width≤300μs, duty cycle≤2%

## Typical Characteristics

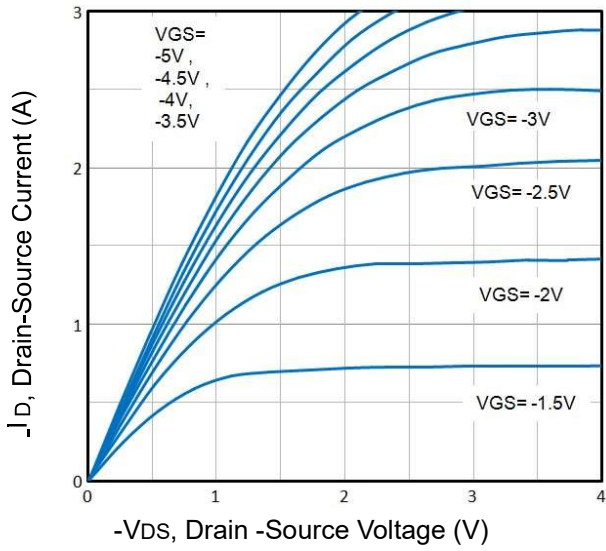


Fig1. Typical Output Characteristics

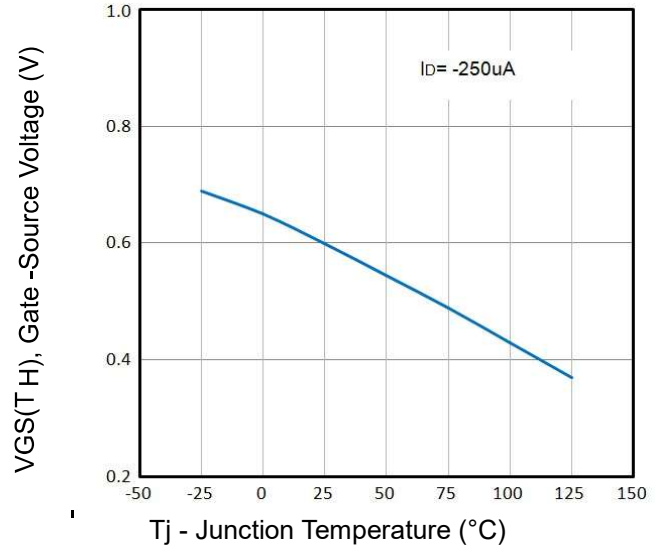


Fig2. Normalized Threshold Voltage Vs. Temperature

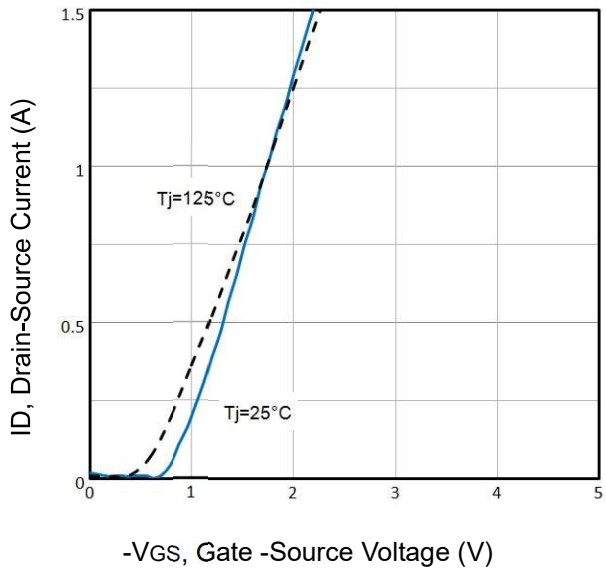


Fig3. Typical Transfer Characteristics

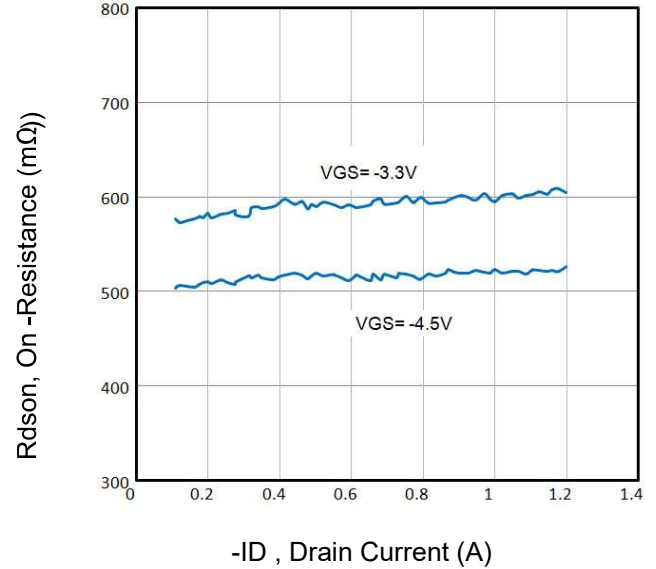


Fig4. On-Resistance vs. Drain Current and Gate

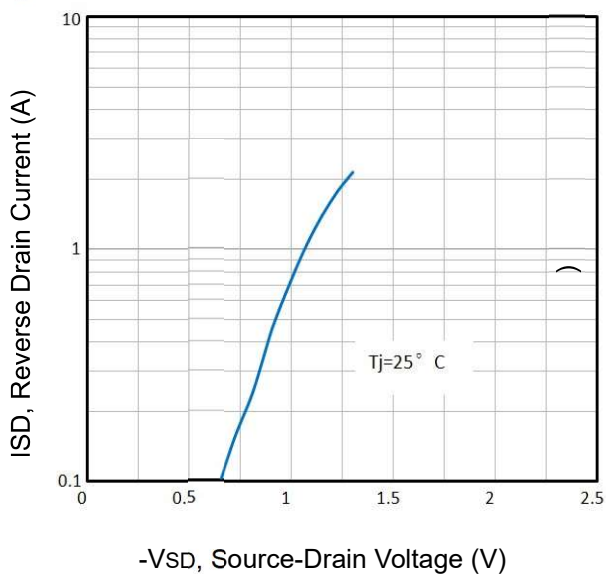


Fig5. Typical Source-Drain Diode Forward Voltage

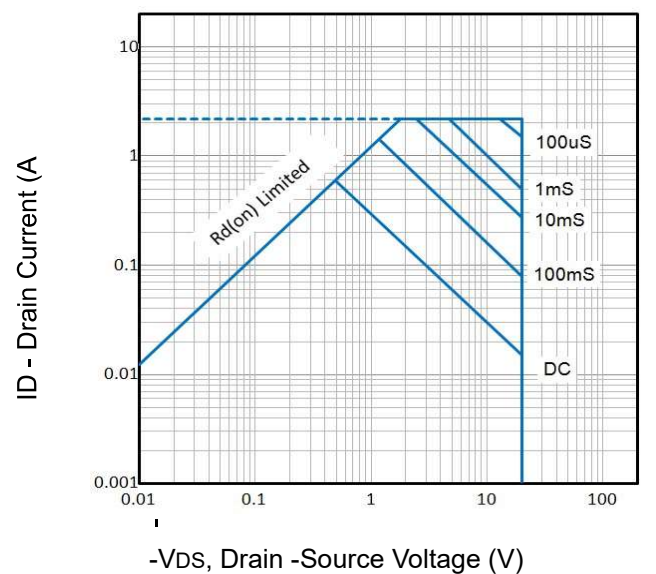


Fig6. Maximum Safe Operating Area

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## Typical Characteristics

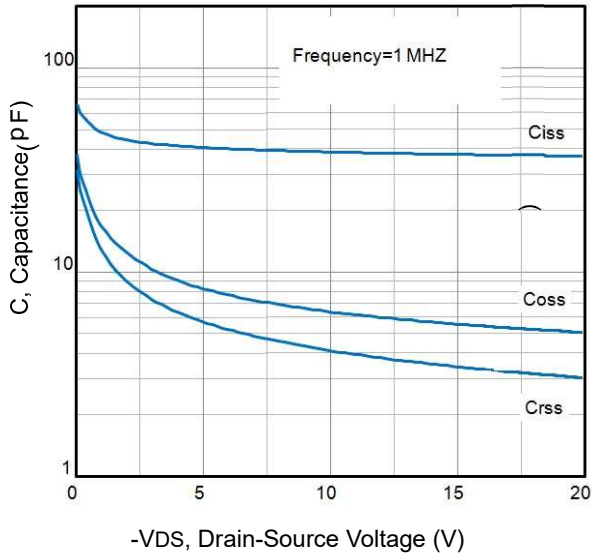


Fig7. Typical Capacitance Vs. Drain-Source Voltage

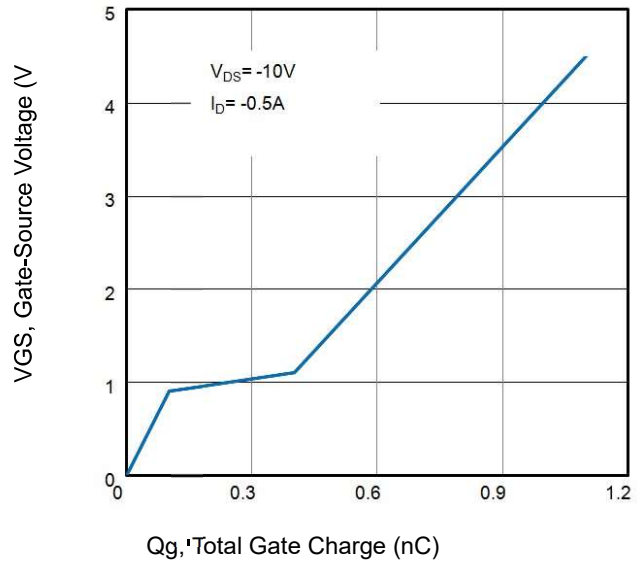


Fig8. Typical Gate Charge Vs. Gate-Source Voltage

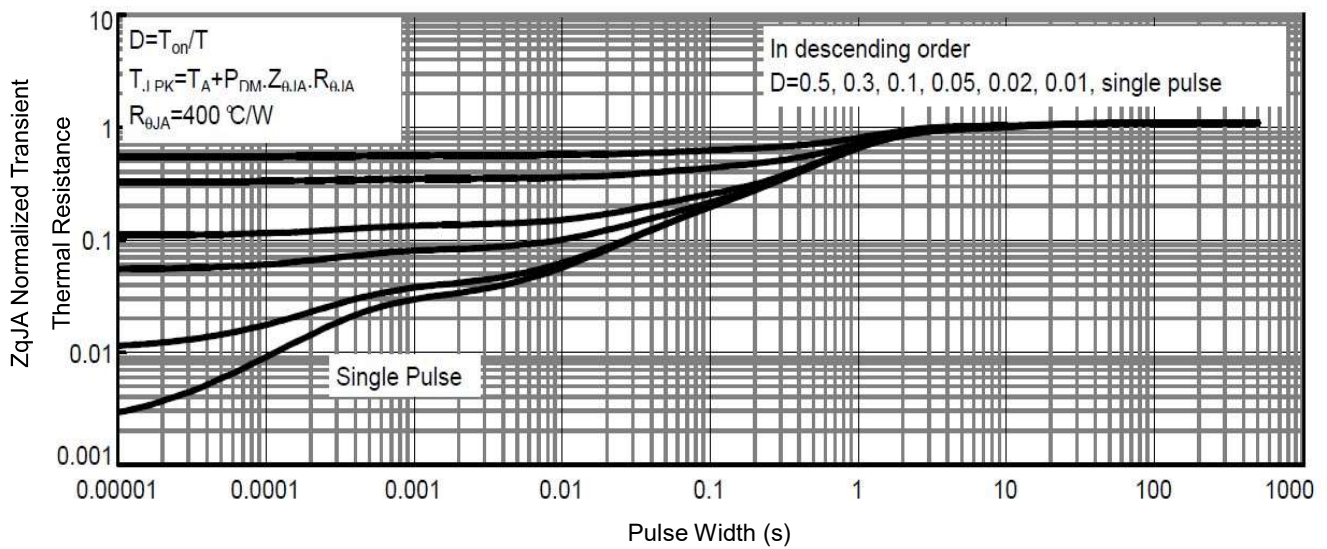


Fig9. Normalized Maximum Transient Thermal Impedance

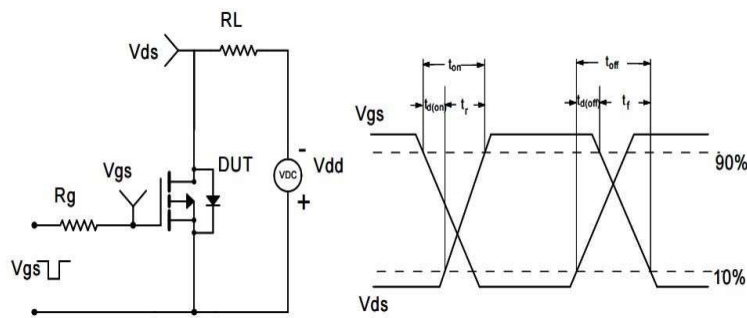
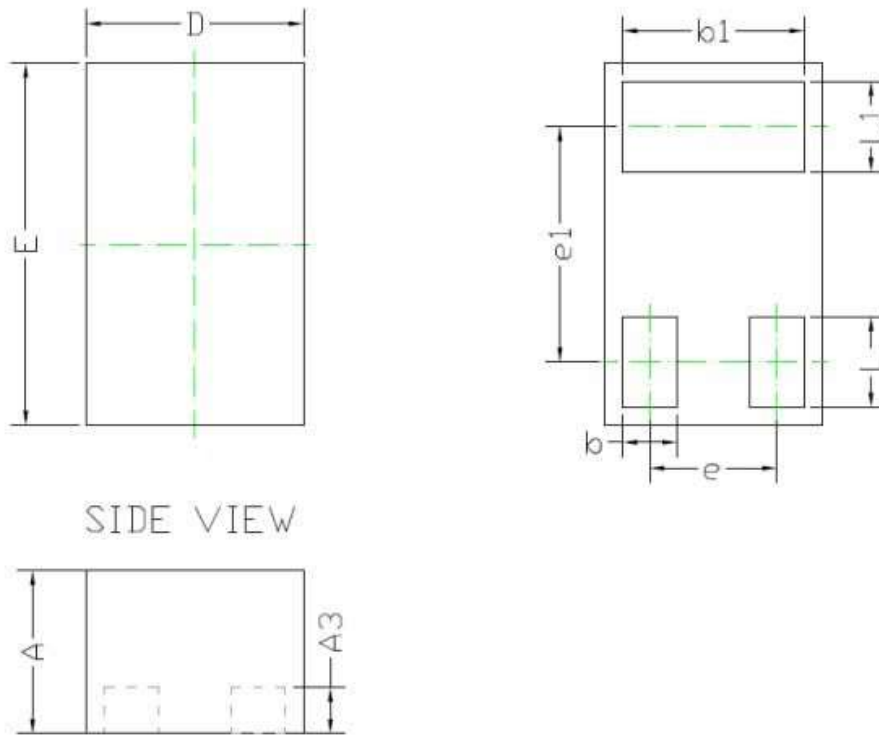


Fig10. Switching Time Test Circuit and waveforms

## 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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[IPS60R360PFD7SAKMA1](#) [IPS60R600PFD7SAKMA1](#)