

## Complementary PowerTrench MOSFET

### KDC6020C(FDC6020C)

#### Features

N-Channel :  $V_{DS}=20V$   $I_D=5.9A$

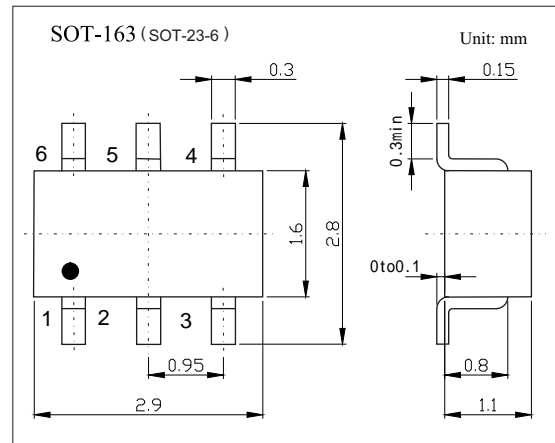
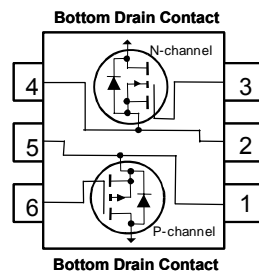
$$R_{DS(ON)} < 27m \quad (V_{GS} = 4.5V)$$

$$R_{DS(ON)} < 39m \quad (V_{GS} = 2.5V)$$

P-Channel :  $V_{DS}=-20V$   $I_D=-4.2A$

$$R_{DS(ON)} < 55m \quad (V_{GS} = -4.5V)$$

$$R_{DS(ON)} < 82m \quad (V_{GS} = -2.5V)$$



#### Absolute Maximum Ratings $T_a = 25$

Parameter	Symbol	N-Channel	P-Channel	Unit
Drain-Source Voltage	$V_{DS}$	20	-20	V
Gate-Source Voltage	$V_{GS}$	$\pm 12$	$\pm 12$	
Continuous Drain Current	$I_D$	5.9	-4.2	A
Pulsed Drain Current	$I_{DM}$	20	-20	
Power Dissipation for Dual Operation	$P_D$	1.6		W
Power Dissipation for single Operation		1.8		
Thermal Resistance.Junction- to-Ambient	$R_{thJA}$	68		/W
Thermal Resistance.Junction- to-Case	$R_{thc}$	1		
Junction and Storage Temperature Range	$T_J, T_{STG}$	-55 to 150		

## KDC6020C(FDC6020C)

Electrical Characteristics Ta = 25

Parameter	Symbol	Testconditions	Type	Min	Typ	Max	Unit
Drain-Source Breakdown Voltage	V <sub>DSS</sub>	I <sub>D</sub> =250 μA, V <sub>GS</sub> =0V	N-CH	20			V
		I <sub>D</sub> =-250 μA, V <sub>GS</sub> =0V	P-CH	-20			
Zero Gate Voltage Drain Current	I <sub>DSS</sub>	V <sub>DS</sub> =16V, V <sub>GS</sub> =0V	N-CH			1	μA
		V <sub>DS</sub> =-16V, V <sub>GS</sub> =0V	P-CH			-1	
Gate-Body leakage current	I <sub>GSS</sub>	V <sub>DS</sub> =0V, V <sub>GS</sub> = ± 12V	N-CH			± 100	nA
		V <sub>DS</sub> =0V, V <sub>GS</sub> = ± 12V	P-CH			± 100	
Gate Threshold Voltage	V <sub>GS(th)</sub>	V <sub>DS</sub> =V <sub>GS</sub> I <sub>D</sub> =250 μA	N-CH	0.6	1	1.5	V
		V <sub>DS</sub> =V <sub>GS</sub> I <sub>D</sub> =-250 μA	P-CH	-0.6	-1	-1.5	
Static Drain-Source On-Resistance	R <sub>DS(on)</sub>	V <sub>GS</sub> =4.5V, I <sub>D</sub> =5.9A	N-CH		23	27	m
		V <sub>GS</sub> =4.5V, I <sub>D</sub> =5.9A T <sub>J</sub> =125			31	39	
		V <sub>GS</sub> =2.5V, I <sub>D</sub> =4.9A			33	39	
		V <sub>GS</sub> =-4.5V, I <sub>D</sub> =-4.2A	P-CH		45	55	
		V <sub>GS</sub> =-4.5V, I <sub>D</sub> =-4.2A T <sub>J</sub> =125			58	75	
		V <sub>GS</sub> =-2.5V, I <sub>D</sub> =-3.4A			65	82	
Forward Transconductance	g <sub>FS</sub>	V <sub>DS</sub> =5V, I <sub>D</sub> =5.9A	N-CH		23		S
		V <sub>DS</sub> =-5V, I <sub>D</sub> =-4.2A	P-CH		13		
Input Capacitance	C <sub>iss</sub>	N-Channel:	N-CH		677		pF
			P-CH		753		
Output Capacitance	C <sub>oss</sub>	V <sub>GS</sub> =0V, V <sub>DS</sub> =10V, f=1MHz P-Channel:	N-CH		171		
			P-CH		163		
Reverse Transfer Capacitance	C <sub>rss</sub>	V <sub>GS</sub> =0V, V <sub>DS</sub> =-10V, f=1MHz	N-CH		91		
			P-CH		83		
Gate resistance	R <sub>g</sub>	V <sub>GS</sub> =15mV, f=1MHz	N-CH		2.2		
			P-CH		8		
Total Gate Charge	Q <sub>g</sub>	N-Channel:	N-CH		6	8	nC
			P-CH		7	10	
Gate Source Charge	Q <sub>gs</sub>	V <sub>GS</sub> =4.5V, V <sub>DS</sub> =10V, I <sub>D</sub> =5.9A P-Channel:	N-CH		1.5		
			P-CH		1.6		
Gate Drain Charge	Q <sub>gd</sub>	V <sub>GS</sub> =-4.5V, V <sub>DS</sub> =-10V, I <sub>D</sub> =-4.2A	N-CH		1.8		
			P-CH		1.9		
Turn-On DelayTime	t <sub>d(on)</sub>	N-Channel:	N-CH		11	20	ns
			P-CH		13	23	
Turn-On Rise Time	t <sub>r</sub>	V <sub>GS</sub> =4.5V, V <sub>DS</sub> =10V, I <sub>D</sub> =1A, R <sub>GEN</sub> =6	N-CH		16	29	
			P-CH		8	16	
Turn-Off DelayTime	t <sub>d(off)</sub>	P-Channel:	N-CH		18	32	
			P-CH		26	42	
Turn-Off Fall Time	t <sub>f</sub>	V <sub>GS</sub> =-4.5V, V <sub>DS</sub> =-10V, I <sub>D</sub> =-1A, R <sub>GEN</sub> =6	N-CH		7	14	
			P-CH		14	52	
Body Diode Reverse Recovery Time	t <sub>rr</sub>	I <sub>F</sub> =5.9A, dI/dt=100A/μs	N-CH		15		
		I <sub>F</sub> =-4.2A, dI/dt=100A/μs	P-CH		17		
Body Diode Reverse Recovery Charge	Q <sub>rr</sub>	I <sub>F</sub> =5.9A, dI/dt=100A/μs	N-CH		4		nC
		I <sub>F</sub> =-4.2A, dI/dt=100A/μs	P-CH		6		
Maximum Body-Diode Continuous Current	I <sub>S</sub>		N-CH			1.3	A
			P-CH			-1.3	
Diode Forward Voltage	V <sub>SD</sub>	I <sub>S</sub> =1.3A, V <sub>GS</sub> =0V	N-CH		0.7	1.2	V
		I <sub>S</sub> =-1.3A, V <sub>GS</sub> =0V	P-CH		-0.8	-1.2	