YK8205

N-Channel Enhancement Mode Field Effect Transistor

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HORNBY ELECTRONIC

General Description

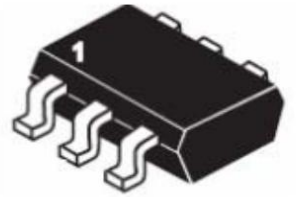
The YK8205 uses advanced trench technology to provide excellent $R_{DS(ON)}$, low gate charge and operation with gate voltages as low as 2.5V. This device is suitable for use as a Battery protection or in other Switching application.

Application

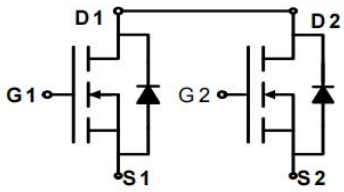
- Battery protection
- Load switch
- Power management

Features

- V_{DS} = 20V,I_D = 5A
  $R_{DS(ON)}$ <32mΩ @V_{GS}=2.5V
  $R_{DS(ON)}$ <25mΩ @V_{GS}=4.5V
- High Power and current handing capability
- Lead free product is acquired
- Surface mount package



SOT23-6L top view



Schematic diagram

Package Marking and Ordering Information

Device Marking	Device	Device Package	Reel Size	Tape width	Quantity
8205	YK8205	SOT-23 -6L	Ø180mm	8mm	3000 units

Absolute Maximum Ratings (T_A=25°Cunless otherwise noted)

Parameter	Symbol	Maximum	Units
Drain-Source Voltage	V_{DSS}	20	V
Gate-Source Voltage	V_{GSS}	±12	V
Drain Current-Continuous V_{GS}=4.5V，@Ta=25°C	I_D	5	A
Maximum Power Dissipation @Ta=25°C	P_D	1.25	W
Operating Junction and Storage Temperature Range	T_J	-55 ~ +150	°C

Thermal Characteristics

Thermal Resistance,Junction-to-Ambient[Note2]	$R_{\theta JA}$	100	°C/W

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Electrical Characteristics (T_A=25°C unless otherwise noted)

Parameter	Symbol	Condition	Min	Typ	Max	Unit
Off Characteristics						
Drain-Source Breakdown Voltage	BV_{DSS}	V_{GS}= 0V, I_D= 250μA	20		-	V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS} = 20V, V_{GS}= 0V	-	-	1	μA
Gate-Body Leakage Current	I_{GSS}	V_{GS} = ±12V,V_{DS} = 0V	-	-	±100	nA
On Characteristics (Note 3)						
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS}= V_{GS}, I_{DS}= 250μA	0.5	0.8	1.2	V
Drain-Source On-State Resistance	$R_{DS(ON)}$	V_{GS}= 2.5V, I_{DS}=2A	-	26	32	mΩ
		V_{GS} =4.5V, I_{DS}= 2A	-	20	25	
Forward Transconductance	g_{FS}	V_{DS} =5V, I_D=5A	-	10	-	S
Dynamic Characteristics (Note4)						
Input Capacitance	C_{iss}	V_{DS}= 10V , V_{GS} = 0V, F =1.0MHz	-	550	-	pF
Output Capacitance	C_{oss}		-	125	-	
Reverse Transfer Capacitance	C_{rss}		-	64	-	
Switching Characteristics (Note 4)						
Turn-on Delay Time	$T_{d(on)}$	VDD=10V,ID=5A VGS=4V,RGEN=10Ω	-	9	-	ns
Turn-on Rise Time	T_r		-	10	-	
Turn-Off Delay Time	$T_{d(OFF)}$		-	32	-	
Turn-Off Fall Time	T_f		-	24	-	
Total Gate Charge	Q_g	VDS=10V,ID=5A, VGS=4.5V	-	9.5	-	nC
Gate-Source Charge	Q_{gs}		-	2.1	-	
Gate-Drain Charge	Q_{gd}		-	1.4	-	
Drain-Source Diode Characteristics						
Diode Forward Voltage (Note 3)	V_{SD}	I_S =5A, V_{GS}=0V Tj = 25°C	-	-	1.2	V
Diode Forward Current (Note 2)	I_S		-	-	5	A

Notes:

1. Repetitive Rating: Pulse width limited by maximum junction temperature.
2. Surface Mounted on FR4 Board, t ≤ 10 sec.
3. Pulse Test: Pulse Width ≤ 300μs, Duty Cycle ≤ 2%.
4. Guaranteed by design, not subject to production

Typical Electrical and Thermal Characteristics

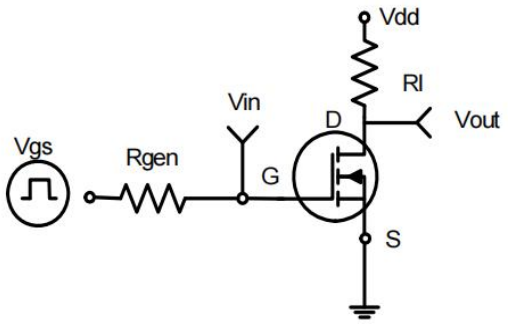

Figure 1:Switching Test Circuit

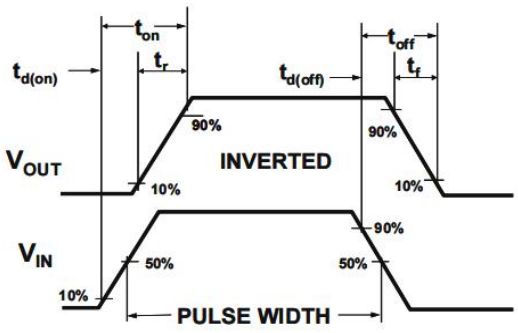

Figure 2:Switching Waveforms

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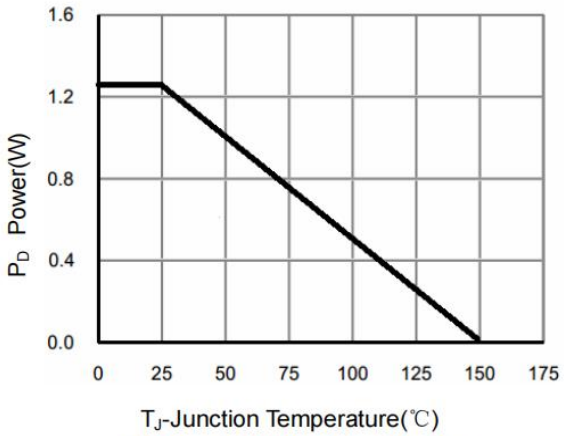

Figure 3 Power Dissipation

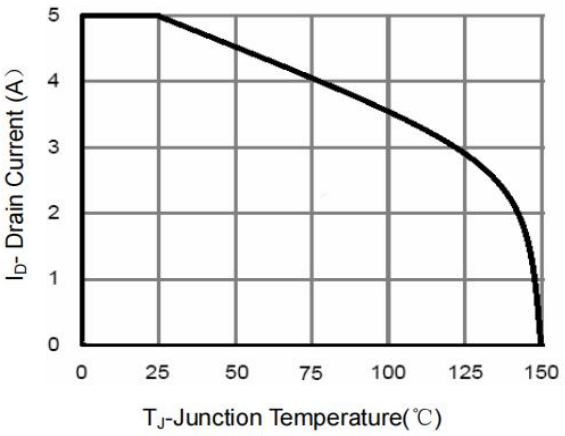

Figure 4 Drain Current

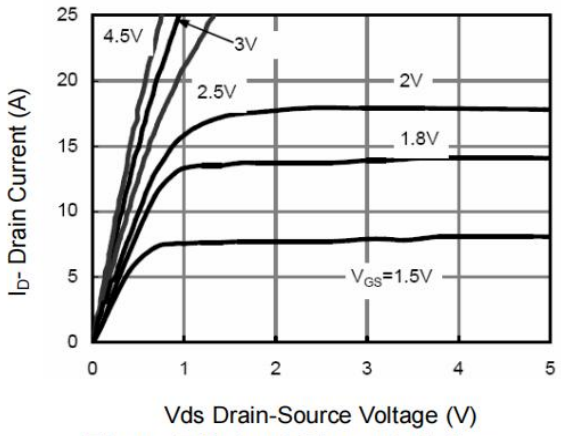

Figure 5 Output Characteristics

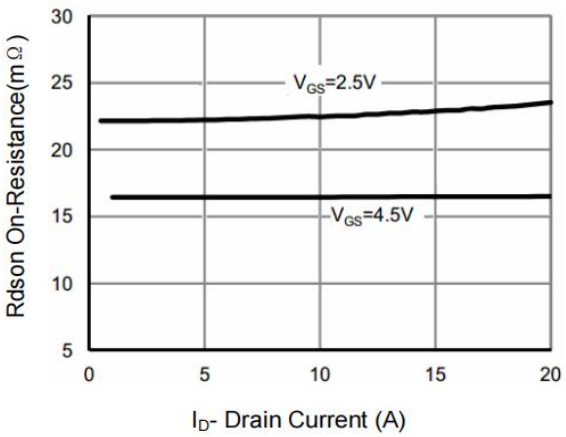

Figure 6 Drain-Source On-Resistance

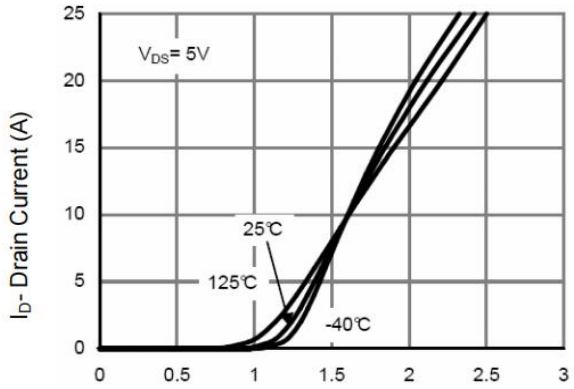

Figure 7 Transfer Characteristics

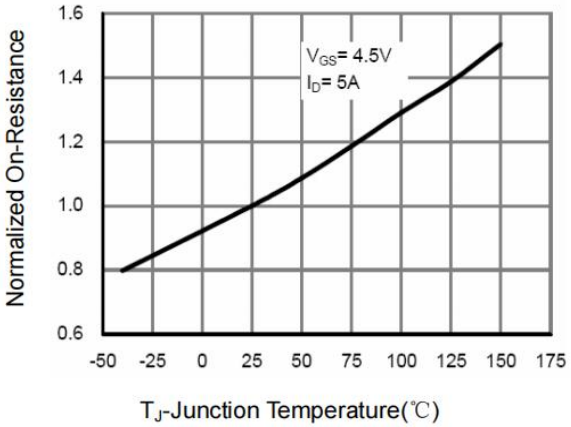

Figure 8 Drain-Source On-Resistance

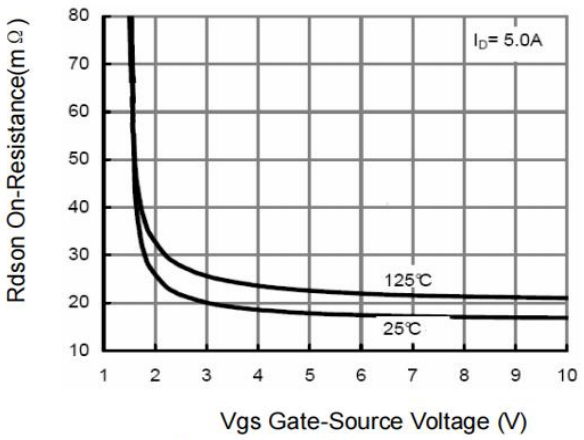

Figure 9 Rdson vs Vgs

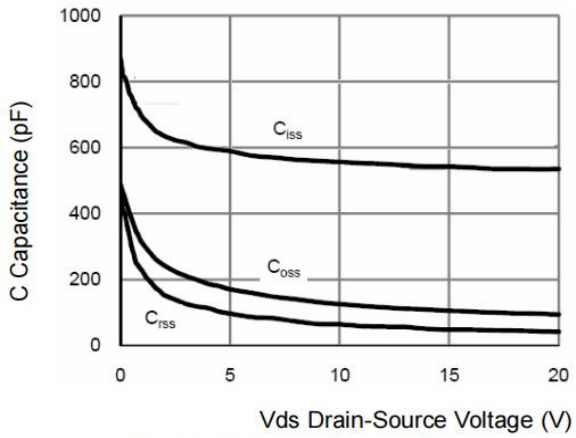

Figure 10 Capacitance vs Vds

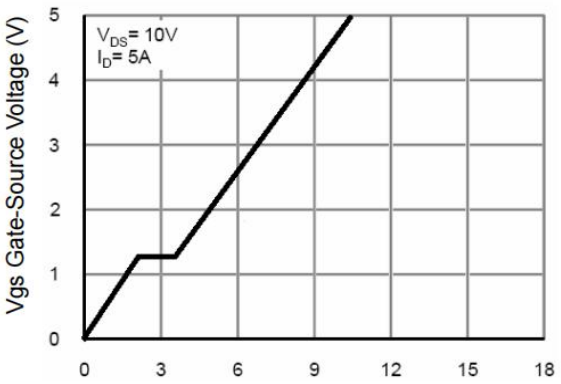

Figure 11 Gate Charge

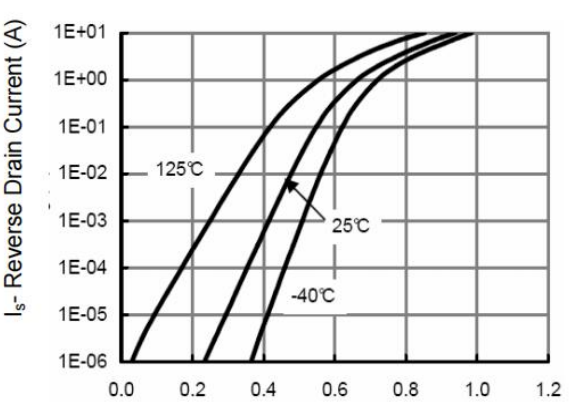

Figure 12 Source- Drain Diode Forward

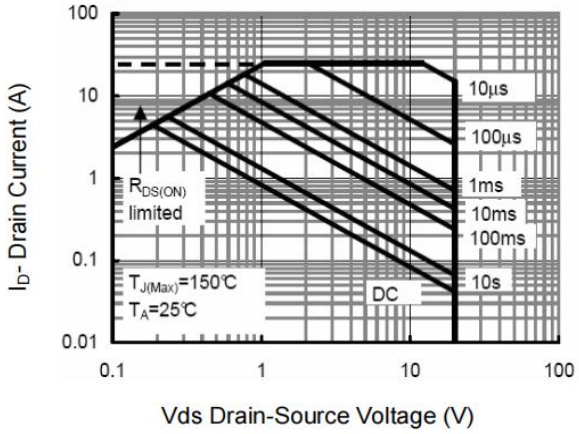

Figure 13 Safe Operation Area

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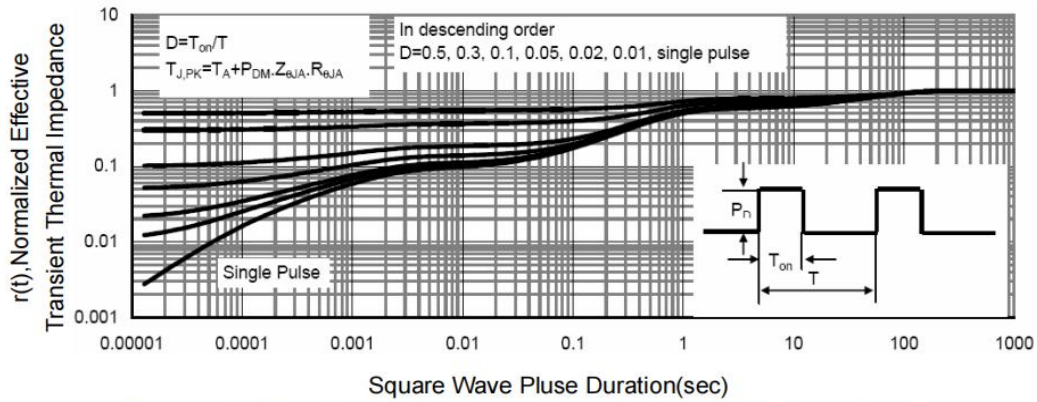

Figure 14 Normalized Maximum Transient Thermal Impedance

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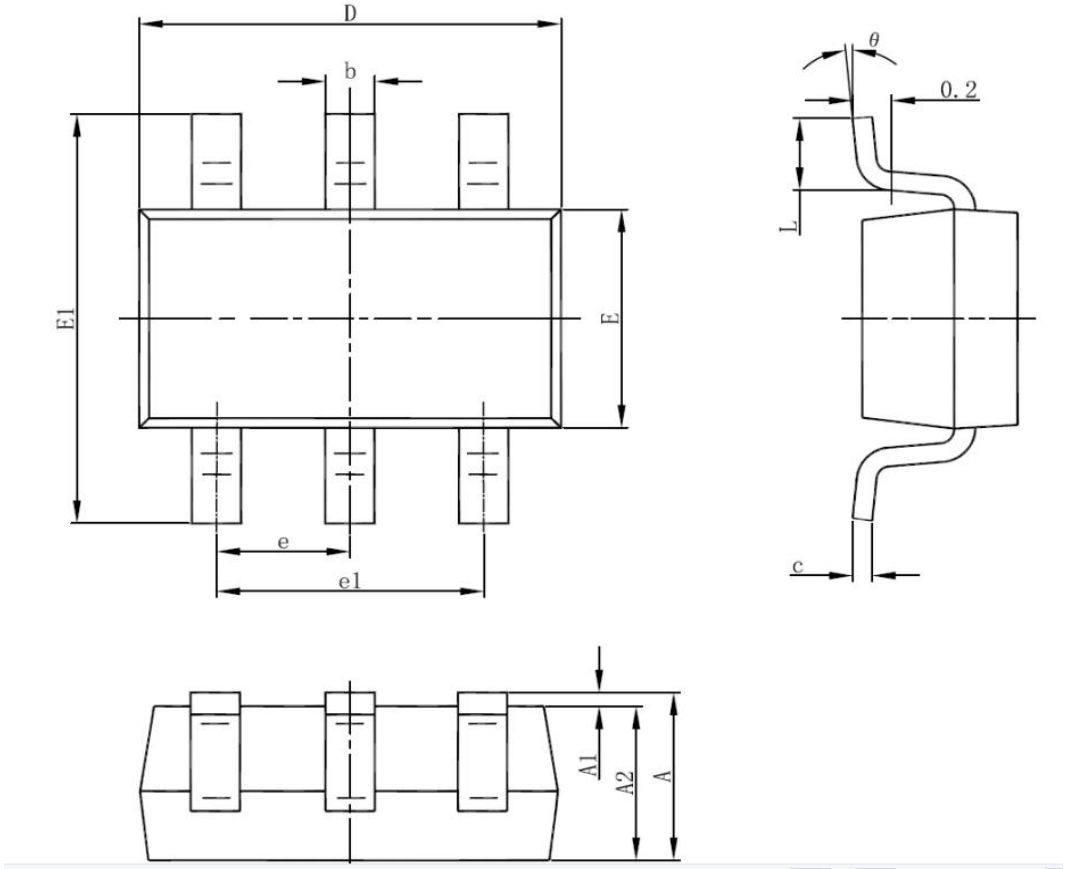
SOT-23-6L Package Information



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	1.050	1.250	0.041	0.049
A1	0.000	0.100	0.000	0.004
A2	1.050	1.150	0.041	0.045
b	0.300	0.500	0.012	0.020
c	0.100	0.200	0.004	0.008
D	2.820	3.020	0.111	0.119
E	1.500	1.700	0.059	0.067
E1	2.650	2.950	0.104	0.116
e	0.950(BSC)		0.037(BSC)	
e1	1.800	2.000	0.071	0.079
L	0.300	0.600	0.012	0.024
θ	0°	8°	0°	8°