

## DESCRIPTION

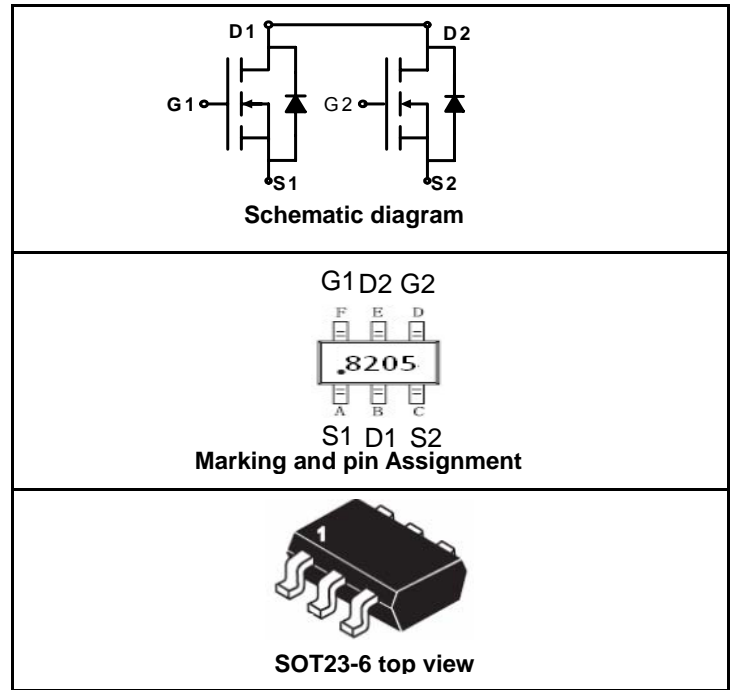
The FNK8205 uses advanced trench technology to provide excellent  $R_{DS(ON)}$ , low gate charge and operation with gate voltages as low as 2.5V. This device is suitable for use as a Battery protection or in other Switching application.

## GENERAL FEATURES

- $V_{DS} = 20V, I_D = 4A$   
 $R_{DS(on)} < 38m\Omega @ V_{GS}$   
 $R_{DS(on)} < 29m\Omega @ V_{GS}=4.5V$
- High Power and current handing capability
- Lead free product is acquired
- Surface Mount Package

## Application

- Battery protection
- Load switch
- Power management



## PACKAGE MARKING AND ORDERING INFORMATION

Device Marking	Device	Device Package	Reel Size	Tape width	Quantity
8205	FNK8205	SOT23-6	Ø180mm	8mm	3000 units

## ABSOLUTE MAXIMUM RATINGS(TA=25°C unless otherwise noted)

Parameter	Symbol	Limit	Unit
Drain-Source Voltage	$V_{DS}$	20	V
Gate-Source Voltage	$V_{GS}$	±10	V
Drain Current-Continuous@ Current-Pulsed (Note 1)	$I_D$	4	A
	$I_{DM}$	25	A
Maximum Power Dissipation	$P_D$	1.25	W
Operating Junction and Storage Temperature Range	$T_J, T_{STG}$	-55 To 150	°C

## THERMAL CHARACTERISTICS

Thermal Resistance, Junction-to-Ambient (Note 2)	$R_{\theta JA}$	100	°C/W
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## ELECTRICAL CHARACTERISTICS (TA=25°C unless otherwise noted)

Parameter	Symbol	Condition	Min	Typ	Max	Unit
<b>OFF CHARACTERISTICS</b>						
Drain-Source Breakdown Voltage	$BV_{DSS}$	$V_{GS}=0V, I_D=250\mu A$	20			V
Zero Gate Voltage Drain Current	$I_{DSS}$	$V_{DS}=16V, V_{GS}=0V$			1	μA
Gate-Body Leakage Current	$I_{GSS}$	$V_{GS}=\pm 10V, V_{DS}=0V$			±100	nA
<b>ON CHARACTERISTICS (Note 3)</b>						
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=250\mu A$	0.5	0.8	1.2	V
Drain-Source On-State Resistance	$R_{DS(ON)}$	$V_{GS}=4V, I_D=4A$		22	29	mΩ
		$V_{GS}=2.5V, I_D=3A$		33	38	mΩ
Forward Transconductance	$g_{FS}$	$V_{DS}=5V, I_D=4A$		10		S

### DYNAMIC CHARACTERISTICS (Note4)

Input Capacitance	$C_{iss}$	$V_{DS}=8V, V_{GS}=0V,$ $F=1.0MHz$	810		PF
Output Capacitance	$C_{oss}$		157		PF
Reverse Transfer Capacitance	$C_{rss}$		115		PF

### SWITCHING CHARACTERISTICS (Note 4)

Turn-on Delay Time	$t_{d(on)}$	$V_{DD}=10V, I_D=1A$ $V_{GS}=4V, R_{GEN}=10\Omega$	17.5		nS
Turn-on Rise Time	$t_r$		4.8		nS
Turn-Off Delay Time	$t_{d(off)}$		33.5		nS
Turn-Off Fall Time	$t_f$		20		nS
Total Gate Charge	$Q_g$	$V_{DS}=10V, I_D=4A,$ $V_{GS}=4V$	13		nC
Gate-Source Charge	$Q_{gs}$		2.2		nC
Gate-Drain Charge	$Q_{gd}$		2.5		nC

### DRAIN-SOURCE DIODE CHARACTERISTICS

Diode Forward Voltage (Note 3)	$V_{SD}$	$V_{GS}=0V, I_S=2A$	0.8	1.2	V
Diode Forward Current (Note 2)	$I_S$			2	A

### NOTES:

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

## TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS

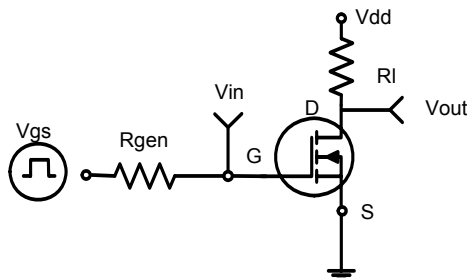


Figure 1: Switching Test Circuit

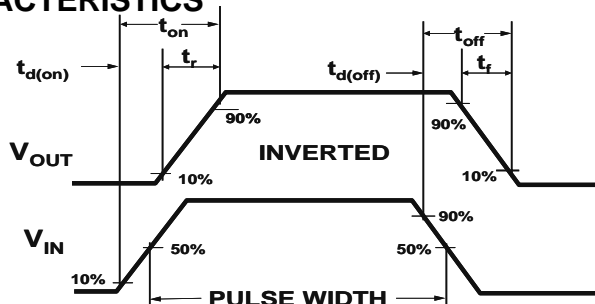


Figure 2: Switching Waveforms

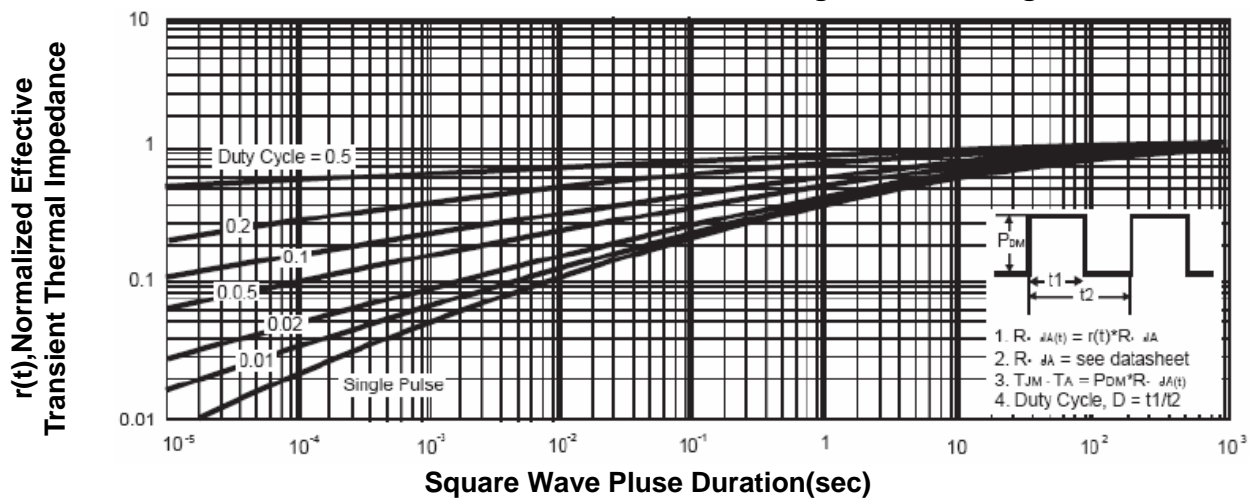
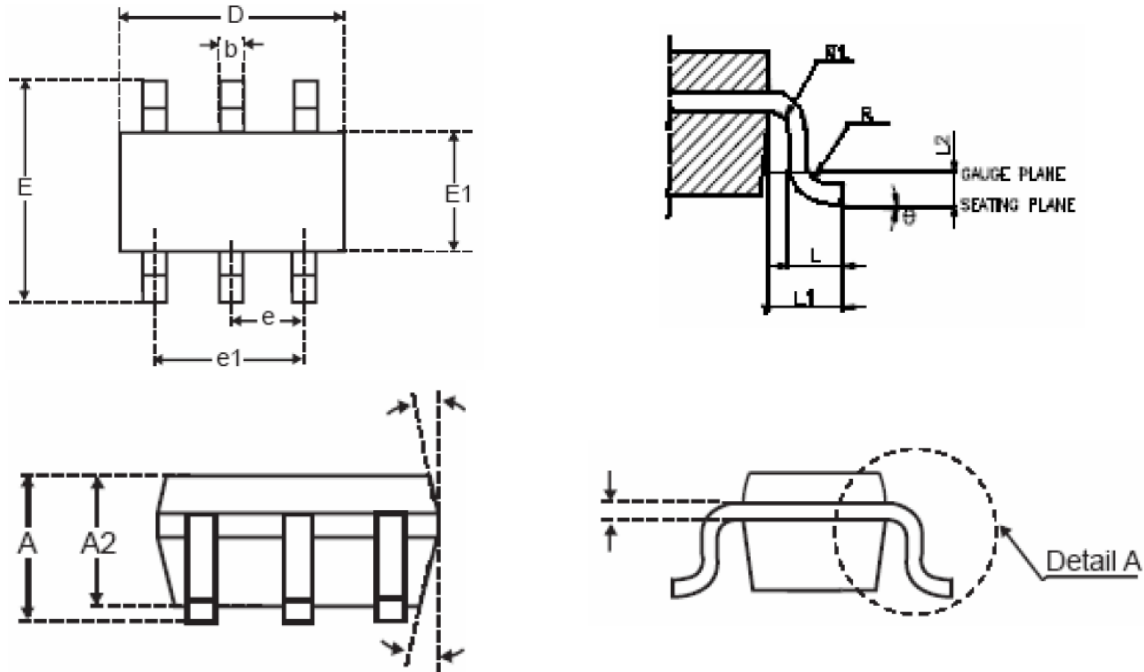


Figure 3: Normalized Maximum Transient Thermal Impedance

## SOT23-6 PACKAGE INFORMATION

Dimensions in Millimeters (UNIT:mm)



SYMBOLS	MILLIMETERS		
	MIN.	NOM.	MAX.
A			1.45
A1			0.15
A2	0.90	1.15	1.30
b	0.30		0.50
c	0.08		0.22
D	2.90 BSC.		
E	2.80 BSC.		
E1	1.60 BSC.		
e	0.95 BSC.		
e1	1.90 BSC.		
L	0.30	0.45	0.60
L1	0.60 REF		
L2	0.25 BSC.		
R	0.10		
R1	0.10		0.25
$\theta$	0°	4°	8°
$\theta$ 1	5°	10°	15°

### NOTES:

1. All dimensions are in millimeters.
2. Dimensions are inclusive of plating
3. Package body sizes exclude mold flash and gate burrs. Mold flash at the non-lead sides should be less than 6 mils.
4. Dimension L is measured in gauge plane.
5. Controlling dimension is millimeter, converted inch dimensions are not necessarily exact.