

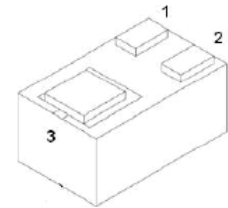
N-Channel MOSFET

2KK6013DFN

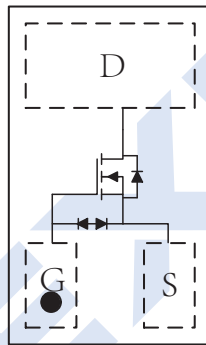
■ Features

- $V_{DS} (V) = 50 V$
- $I_D = 0.3 A$
- $R_{DS(ON)} (at V_{GS} = 10 V) = 1.2 \Omega$
- $R_{DS(ON)} (at V_{GS} = 4.5 V) = 1.4 \Omega$
- $R_{DS(ON)} (at V_{GS} = 1.8 V) = 4.0 \Omega$
- ESD Protected

DFN1006-3



- 1.GATE
- 2.SOURCE
- 3.DRAIN



■ Absolute Maximum Ratings ($T_a = 25^\circ C$ unless otherwise noted)

Parameter	Symbol	Rating	Unit
Drain-Source Voltage	V_{DS}	50	V
Gate-Source Voltage	V_{GS}	± 20	
Continuous Drain Current (Note 1)	I_D	0.3	A
Pulsed Drain Current ($t_p=10\mu s$)	I_{DM}	0.9	
Power Dissipation (Note 1)	P_D	0.25	mW
Thermal Resistance, Junction-to-Ambient (Note 1)	$R_{\theta JA}$	500	$^\circ C/W$
Junction Temperature	T_J	150	$^\circ C$
Storage Temperature Range	T_{stg}	-55 to 150	

Note 1.Surface mounted on FR4 board using the minimum recommended pad size.

2KK6013DFN

■ Electrical Characteristics ($T_a = 25^\circ\text{C}$ unless otherwise specified)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
STATIC PARAMETERS						
Drain-Source Breakdown Voltage	BV_{DS}	$I_D = 250\ \mu\text{A}$, $V_{GS} = 0\text{V}$	50			V
Zero Gate Voltage Drain Current	I_{BSS}	$V_{DS} = 30\text{V}$, $V_{GS} = 0\text{V}$			1	μA
Gate to Source Leakage Current	I_{GSS}	$V_{DS} = 0\text{V}$, $V_{GS} = \pm 20\text{V}$			± 5	
Gate to Source Threshold Voltage (Note 2)	$V_{GS(th)}$	$V_{DS} = V_{GS}$, $I_D = 250\ \mu\text{A}$	0.8		1.5	V
Static Drain-Source On-Resistance (Note 2)	$R_{DS(on)}$	$V_{GS} = 10\text{V}$, $I_D = 0.45\text{A}$		1.2	1.8	Ω
		$V_{GS} = 4.5\text{V}$, $I_D = 0.25\text{A}$		1.4	2	
		$V_{GS} = 2.5\text{V}$, $I_D = 0.01\text{A}$		2	6	
		$V_{GS} = 1.8\text{V}$, $I_D = 0.01\text{A}$		4		
Forward Transconductance (Note 2)	g_{FS}	$V_{DS} = 15\text{V}$, $I_D = 0.1\text{A}$		0.5		S
Diode Forward Voltage	V_{SD}	$V_{GS} = 0\text{V}$, $I_S = 0.25\text{A}$			1.2	V
DYNAMIC PARAMETERS (Note 4)						
Input Capacitance	C_{iss}	$V_{GS} = 0\text{V}$, $f = 1\text{MHz}$, $V_{DS} = 15\text{V}$,		23		pF
Output Capacitance	C_{oss}			12		
Reverse Transfer Capacitance	C_{rss}			5		
Total Gate Charge	$Q_g(\text{tot})$	$V_{GS} = 10\text{V}$, $V_{DS} = 30\text{V}$, $I_D = 0.1\text{A}$		1.6		nC
Threshold Gate Charge	$Q_g(\text{th})$			0.25		
Gate Source Charge	Q_{gs}			0.4		
Gate Drain Charge	Q_{gd}			0.45		
SWITCHING PARAMETERS (Note 4)						
Turn-On Delay Time (Note 3)	$t_{d(on)}$	$V_{GS} = 5\text{V}$, $V_{DD} = 5\text{V}$, $I_D = 10\text{mA}$, $R_L = 500\ \Omega$, $R_G = 10\ \Omega$		8.6		ns
Turn-On Rise Time (Note 3)	t_r			4		
Turn-Off Delay Time (Note 3)	$t_{d(off)}$			23.8		
Turn-Off Fall Time (Note 3)	t_f			14.2		

Notes:

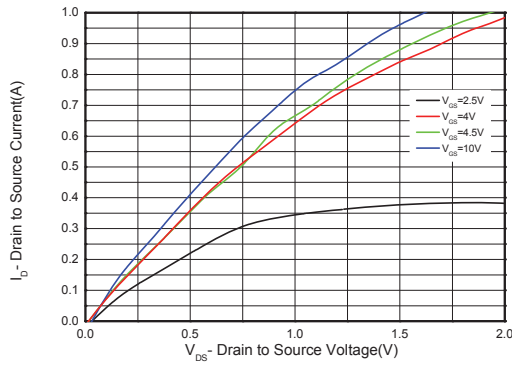
- Pulse Test : Pulse width=300 μs , duty cycle $\leq 2\%$.
- Switching characteristics are independent of operating junction temperatures.
- Granted by design, not subject to producing.

■ Marking

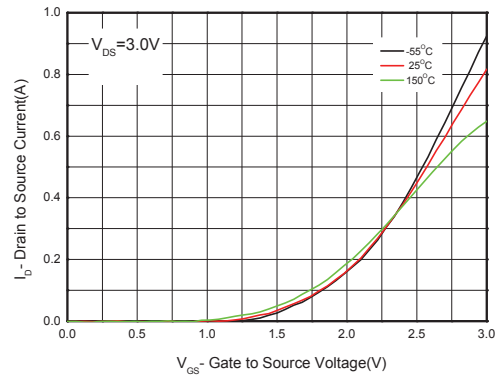
Marking	B
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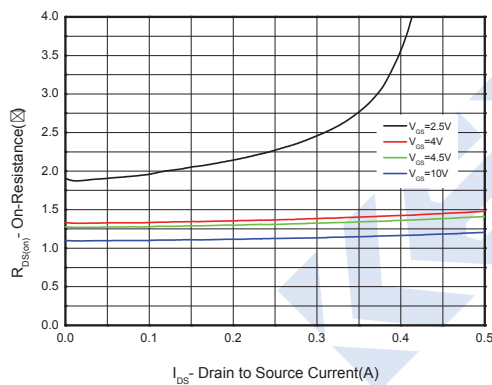
Typical Characteristics



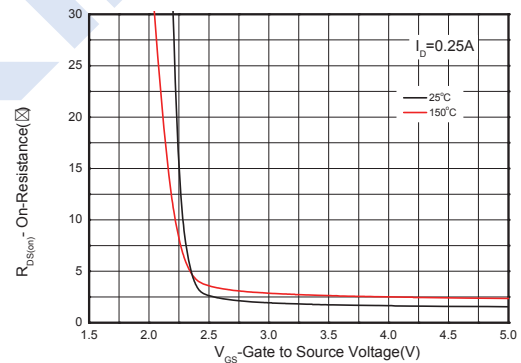
Output characteristics



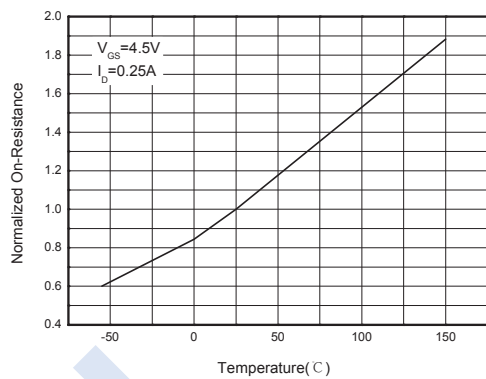
Transfer characteristics



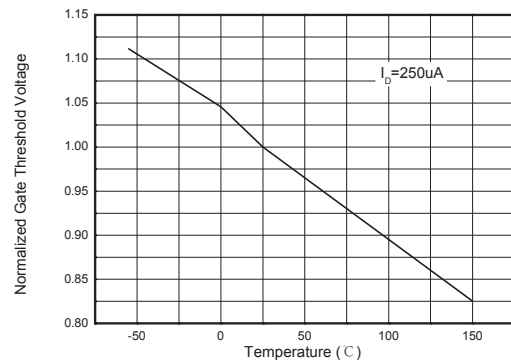
On-Resistance vs. Drain current



On-Resistance vs. Gate-to-Source voltage

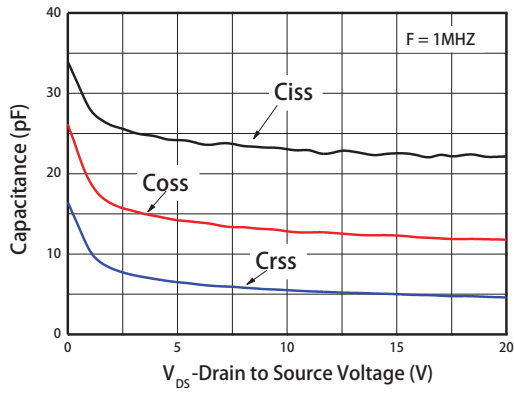


On-Resistance vs. Junction temperature

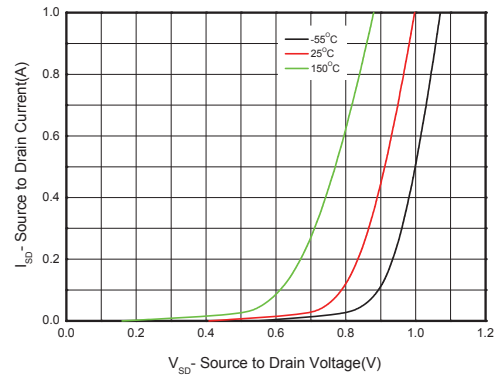


Threshold voltage vs. Temperature

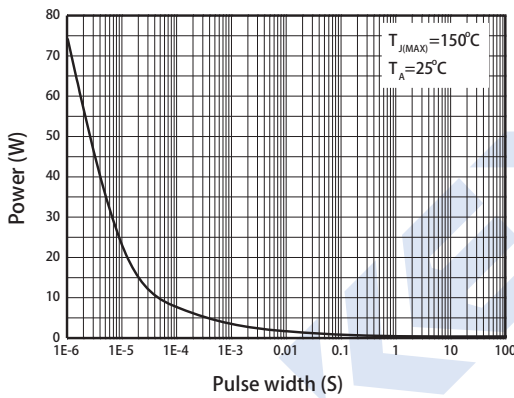
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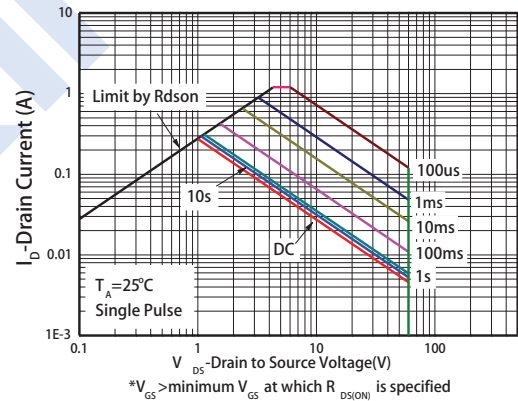
Capacitance



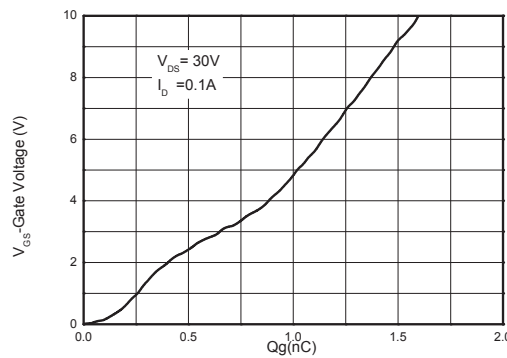
Body diode forward voltage



Single pulse power



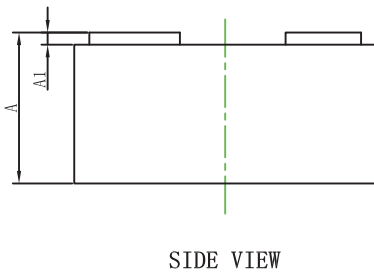
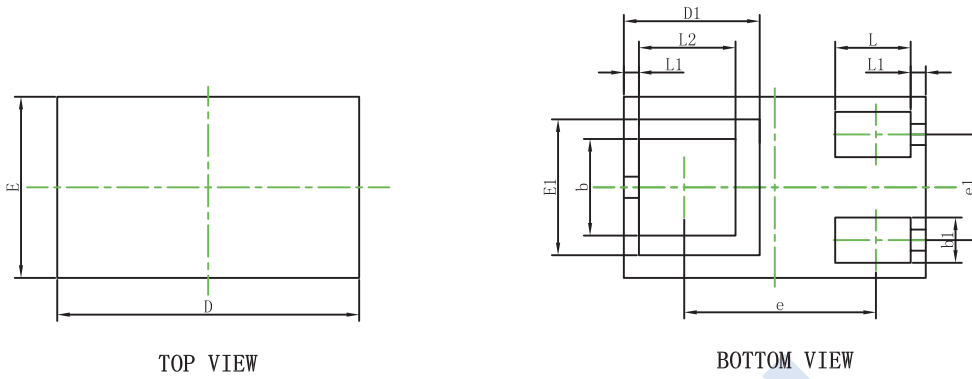
Safe operating power



Gate charge Characteristics

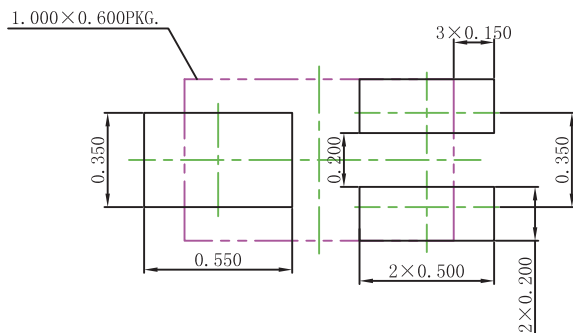
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DFN1006-3 Package Outline Dimensions



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	0.450	0.550	0.018	0.022
A1	0.010	0.100	0.000	0.004
D	0.950	1.050	0.037	0.041
E	0.550	0.650	0.022	0.026
D1	0.450REF.		0.018REF.	
E1	0.450REF.		0.018REF.	
b	0.270	0.370	0.011	0.015
b1	0.100	0.200	0.004	0.008
e	0.635REF.		0.025REF.	
e1	0.300	0.400	0.012	0.016
L	0.200	0.300	0.008	0.012
L1	0.050REF.		0.002REF.	
L2	0.270	0.370	0.011	0.015

DFN1006-3 Suggested Pad Layout



Note:

1. Controlling dimension: in millimeters.
2. General tolerance: ± 0.050 mm.
3. The pad layout is for reference purposes only.