

RoHS  
Compliant



## Features

- $V_{DS}$  (V) = 60V
- $I_D$  = 3.7A ( $V_{GS}$  = 10V)
- $R_{DS(ON)} < 100m\Omega$  ( $V_{GS}$  = 10V)
- $R_{DS(ON)} < 120m\Omega$  ( $V_{GS}$  = 4.5V)

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

Parameter	Symbol	Rating	Unit
Drain-Source Voltage	$V_{DS}$	60	V
Gate-Source Voltage	$V_{GS}$	+20	
Continuous Drain Current	$I_D$	3.7	A
Pulsed Drain Current	$I_{DM}$	25	
Power Dissipation	$P_D$	1.4	W
Thermal Resistance Junction- to-Ambient	$R_{thJA}$	55	°C/W
Junction Temperature	$T_J$	150	°C
Storage Temperature Range	$T_{stg}$	-55 to 150	

## Electrical Characteristics (TA = 25°C)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
<b>Off Characteristics</b>						
Drain-Source Breakdown Voltage	$V_{DSS}$	$I_D = -250\mu A, V_{GS} = 0V$	-60			V
Zero Gate Voltage Drain Current	$I_{DSS}$	$V_{DS} = -60V, V_{GS} = 0V$			1	$\mu A$
Gate-Body leakage current	$I_{GSS}$	$V_{DS} = 0V, V_{GS} = \pm 20V$			$\pm 100$	nA
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = -250\mu A$	1		3	V
Static Drain-Source On-Resistance	$R_{DS(on)}$	$V_{GS} = -10V, I_D = -3.9A$			100	m $\Omega$
		$V_{GS} = -4.5V, I_D = -3.7A$			120	
Forward Transconductance	$g_{FS}$	$V_{DS} = -15V, I_D = -10A$	35			S
On State Drain Current	$I_{D(ON)}$	$V_{GS} = 5V, V_{DS} = 10V$	8			A
Forward Transconductance	$g_{FS}$	$V_{DS} = 5V, I_D = 3.7A$	3	9		S

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Input Capacitance	$C_{iss}$	$V_{GS}=0V, V_{DS}=-25V, f=1MHz$			800	pF
Output Capacitance	$C_{oss}$				250	
Reverse Transfer Capacitance	$C_{rss}$				60	
Total Gate Charge	$Q_g$	$V_{DS}=-10V, V_{DS}=40V, I_D=-3.7A$		9	12	nC
Gate Source Charge	$Q_{gs}$			2		
Gate Drain Charge	$Q_{gd}$			6		
Turn-On Delay Time	$t_{d(on)}$	$I_D=1A, V_{DS}=25V, R_{GEN}=6\Omega$		15	20	nS
Turn-On Rise Time	$t_r$			18	20	
Turn-Off Delay Time	$t_{d(off)}$			40	50	
Turn-Off Fall Time	$t_f$			16	20	
Maximum Body-Diode Continuous Current	$I_S$	$I_{SD}=-12A, V_{GS}=0V$			2.5	A
Diode Forward Current	$V_{SD}$	$I_S=1.5A, V_{GS}=0V$			1.2	V

## Typical Characteristics

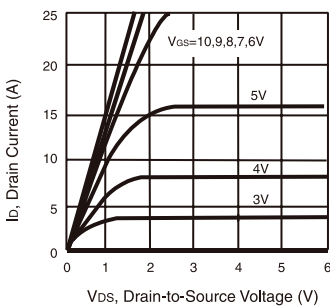


Figure 1. Output Characteristics

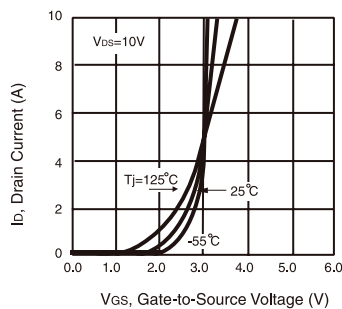


Figure 2. Transfer Characteristics

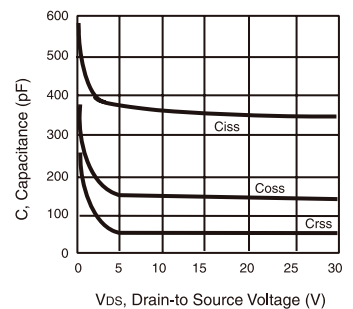


Figure 3. Capacitance

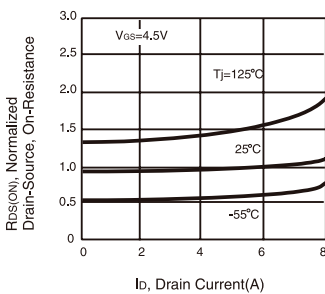


Figure 4. On-Resistance Variation with Drain Current and Temperature

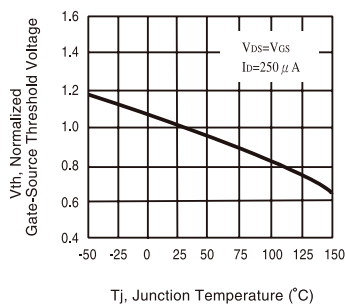


Figure 5. Gate Threshold Variation with Temperature

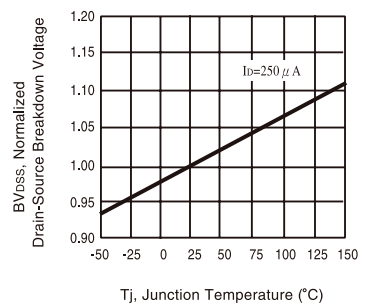


Figure 6. Breakdown Voltage Variation with Temperature

## Typical Characteristics

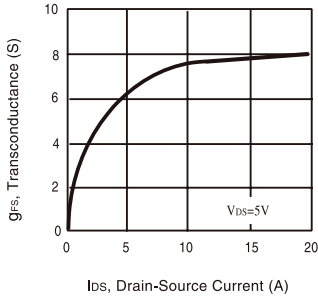


Figure 7. Transconductance Variation with Drain Current

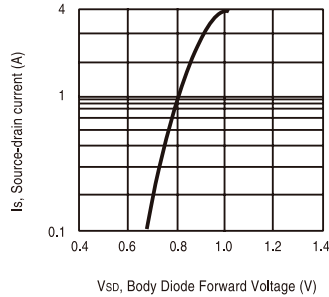


Figure 8. Body Diode Forward Voltage Variation with Source Current

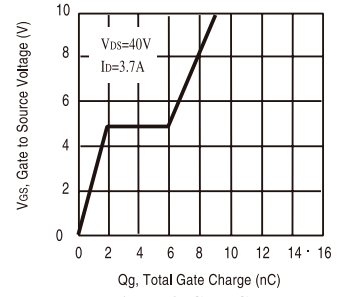


Figure 9. Gate Charge

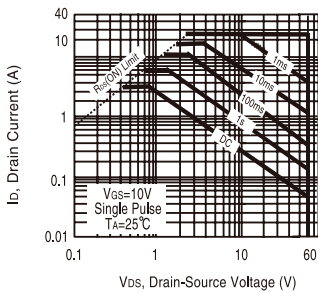


Figure 10. Maximum Safe Operating Area

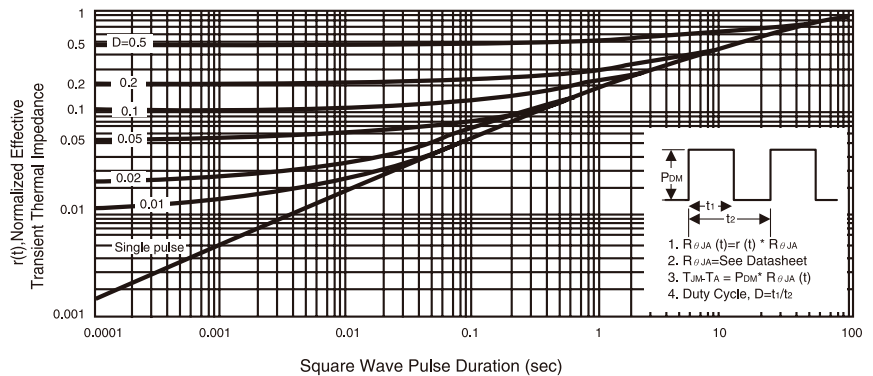
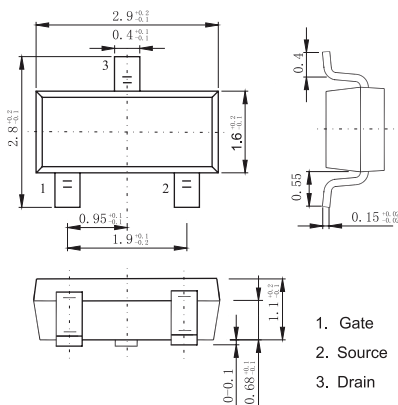


Figure 11. Normalized Thermal Transient Impedance Curve

## Diagram



1. Gate
2. Source
3. Drain

Dimensions : Millimetres

## Part Number Table

Description	Part Number
N Channel MOSFET, 3.7A, 60V, SOT23-3	2KK5013

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