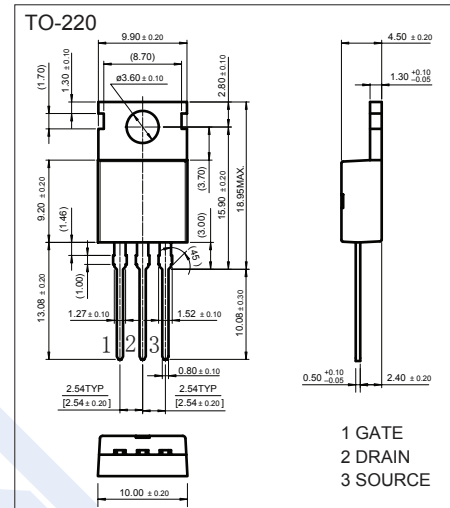
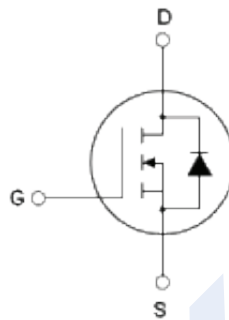


## N-Channel MOSFET

### 2KK6018

#### ■ Features

- $BV_{DSS} = 60\text{ V}$
- $I_D = 120\text{ A}$
- $R_{DS(on)} < 3.5\text{m}\Omega @ V_{GS} = 10\text{V}$
- $R_{DS(on)} < 5\text{m}\Omega @ V_{GS} = 4.5\text{V}$



#### ■ Absolute Maximum Ratings (T<sub>c</sub> = 25°C, unless otherwise specified) (Note 1)

Parameter	Symbol	Rating	Unit
Drain-Source Voltage	V <sub>DS</sub>	60	V
Gate-Source Voltage	V <sub>GS</sub>	±20	
Continuous Drain Current (Note 2)	I <sub>D</sub>	T <sub>c</sub> = 25°C	A
		T <sub>c</sub> = 100°C	
Pulsed Drain Current (Note 3)	I <sub>DM</sub>	320	A
Avalanche Current (Note 3)	I <sub>AR</sub>	120	
Single Pulse Avalanche Energy (Note 4)	E <sub>AS</sub>	432	mJ
Power Dissipation	P <sub>D</sub>	160	W
Thermal Resistance. Junction- to-Ambient	R <sub>θJA</sub>	62.5	°C/W
Thermal Resistance. Junction- to-Case	R <sub>θJC</sub>	0.94	
Operating Junction and Storage Temperature Range	T <sub>J</sub> , T <sub>stg</sub>	-55 to 175	°C

Notes 1. Absolute maximum ratings are those values beyond which the device could be permanently damaged.

2. Drain current limited by maximum junction temperature.
3. Repetitive Rating: Pulse width limited by maximum junction temperature.
4. L = 0.06mH, I<sub>AS</sub> = 120A, V<sub>DD</sub> = 50V, R<sub>G</sub> = 25Ω, Starting T<sub>J</sub> = 25°C.

## N-Channel MOSFET

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■ Electrical Characteristics (T<sub>c</sub> = 25°C, unless otherwise specified)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Drain-Source Breakdown Voltage	BV <sub>DSS</sub>	I <sub>D</sub> =250μA, V <sub>GS</sub> =0V	60			V
Zero Gate Voltage Drain Current	I <sub>DSS</sub>	V <sub>DS</sub> =60V, V <sub>GS</sub> =0V			1	μA
Gate-Body Leakage Current	I <sub>GSS</sub>	V <sub>DS</sub> =0V, V <sub>GS</sub> =±20V			±100	nA
Gate Threshold Voltage	V <sub>GS(th)</sub>	V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> =250μA	1.1		2.2	V
Static Drain-Source On-Resistance	R <sub>DS(on)</sub>	V <sub>GS</sub> =10V, I <sub>D</sub> =40A		3.0	3.5	mΩ
		V <sub>GS</sub> =4.5V, I <sub>D</sub> =40A		3.5	5.0	mΩ
Input Capacitance	C <sub>iss</sub>	V <sub>GS</sub> =0V, V <sub>DS</sub> =25V, f=1MHz		2650		pF
Output Capacitance	C <sub>oss</sub>			1100		
Reverse Transfer Capacitance	C <sub>rss</sub>			55		
Turn-on Delay Time	t <sub>d(on)</sub>	V <sub>DD</sub> =30V, I <sub>D</sub> =40A, R <sub>G</sub> =4.7Ω, V <sub>GS</sub> = 10 V (Note 1,2)		21		ns
Turn-On Rise Time	t <sub>r</sub>			38		
Turn-Off Delay Time	t <sub>d(off)</sub>			61		
Turn-Off Fall Time	t <sub>f</sub>			20		
Total Gate Charge	Q <sub>g</sub>	V <sub>DD</sub> =30V, I <sub>D</sub> =80A, V <sub>GS</sub> =10V (Note 1,2)		44		nC
Gate Source Charge	Q <sub>gs</sub>			15		
Gate Drain Charge	Q <sub>gd</sub>			12		
Body Diode Voltage	V <sub>SD</sub>	I <sub>S</sub> =80A, V <sub>GS</sub> =0V			1.2	V
Body Diode Reverse Recovery Time	t <sub>rr</sub>	I <sub>SD</sub> = 80 A, dI/dt = 100 A/μs, V <sub>DD</sub> =48V		48		ns
Body Diode Reverse Recovery Charge	Q <sub>rr</sub>			60		nC

Notes 1. Pulse Test: Pulse width ≤ 300μs, Duty cycle ≤ 2%

2. Essentially independent of operating temperature typical characteristics

## ■ Marking

2KK6018	K6018 KC***
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# N-Channel MOSFET

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■ Electrical Characteristics (curves)

Figure 1: Safe operating area

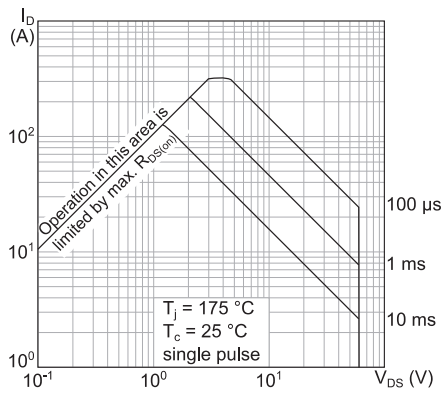


Figure 2: Thermal impedance

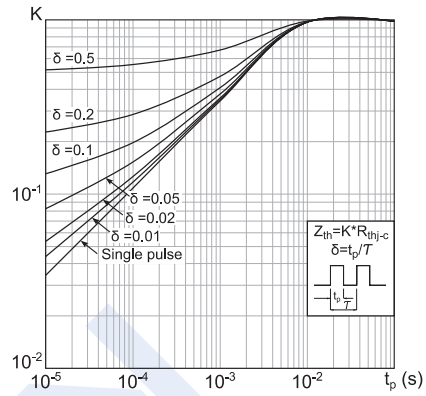


Figure 3: Output characteristics

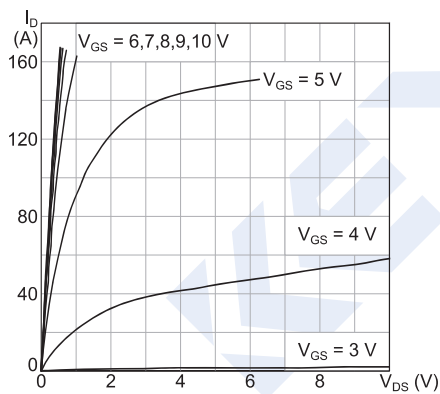


Figure 4: Transfer characteristics

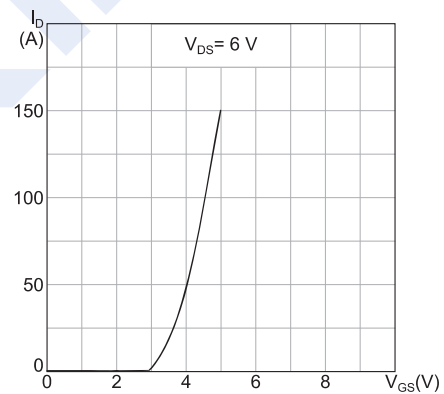


Figure 5: Gate charge vs gate-source voltage

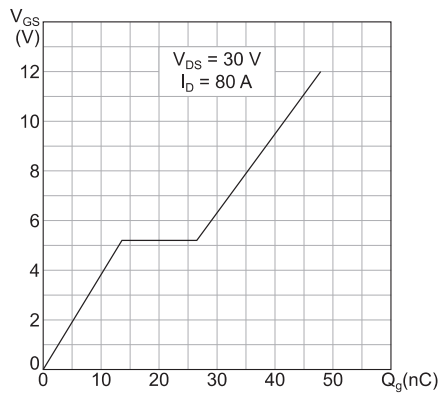
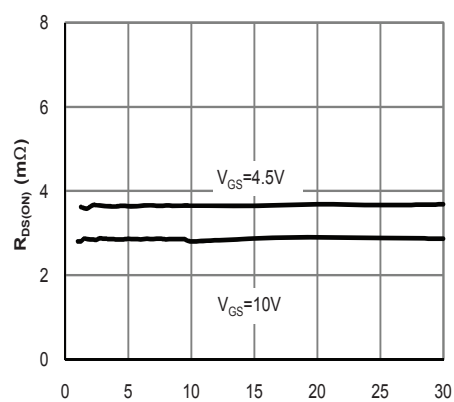


Figure 6: Static drain-source on-resistance



# N-Channel MOSFET

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Figure 7: Capacitance variations

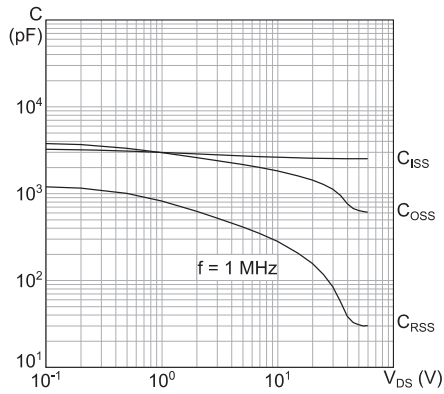


Figure 8: Normalized gate threshold voltage vs temperature

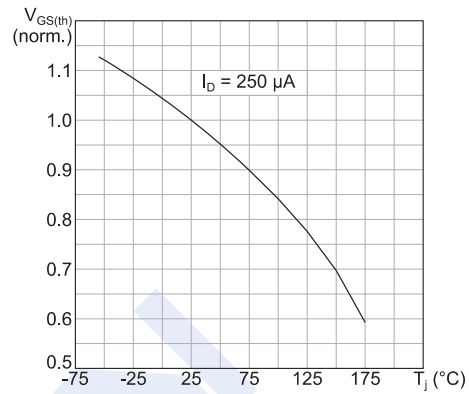


Figure 9 : Normalized on-resistance vs temperature

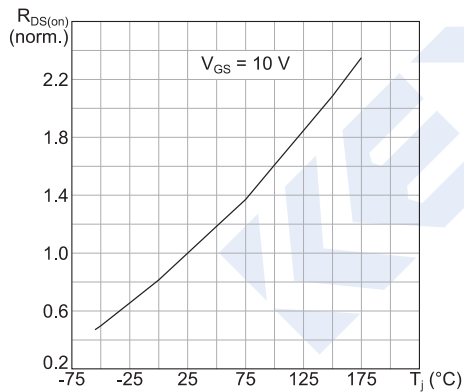


Figure 10: Normalized V(BR)DSS vs temperature

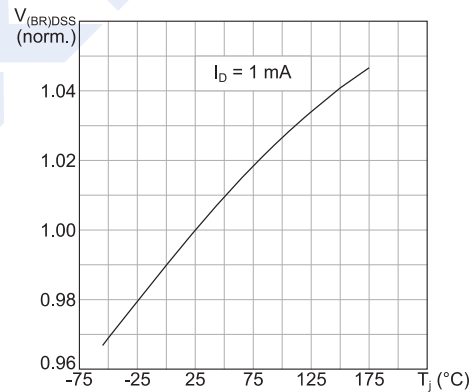
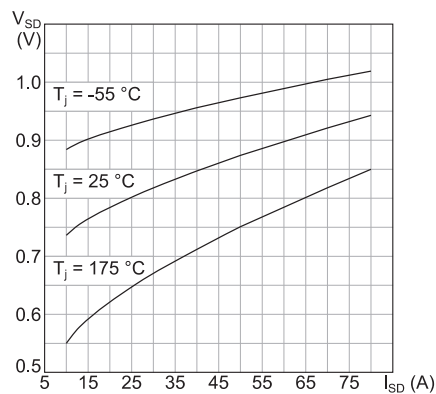


Figure 11: Source-drain diode forward characteristics

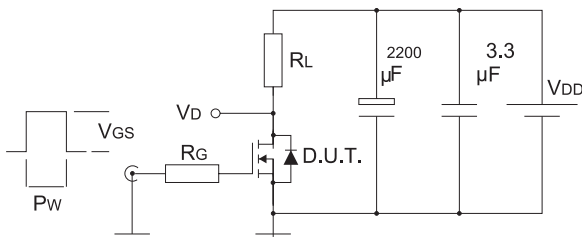


# N-Channel MOSFET

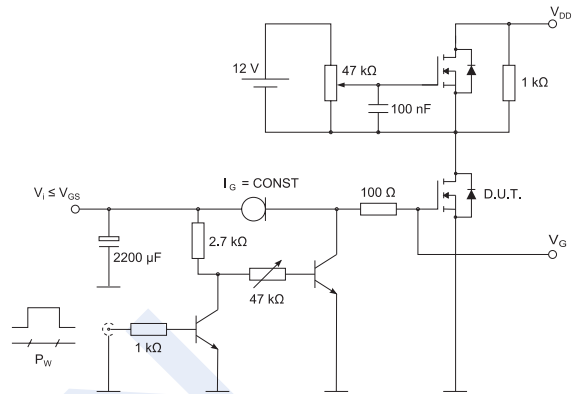
## 2KK6018

■ Test circuits

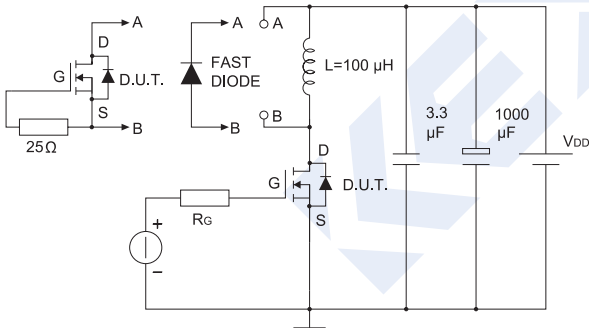
**Figure 12: Switching times test circuit for resistive load**



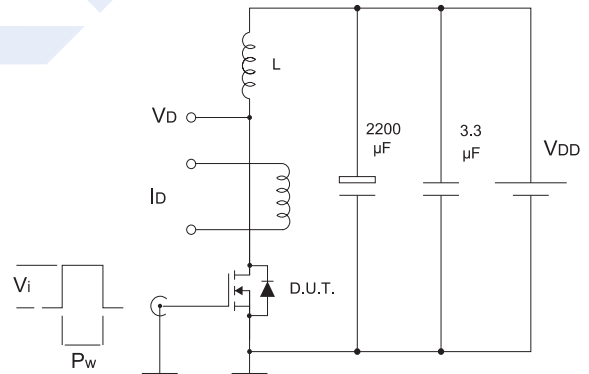
**Figure 13: Gate charge test circuit**



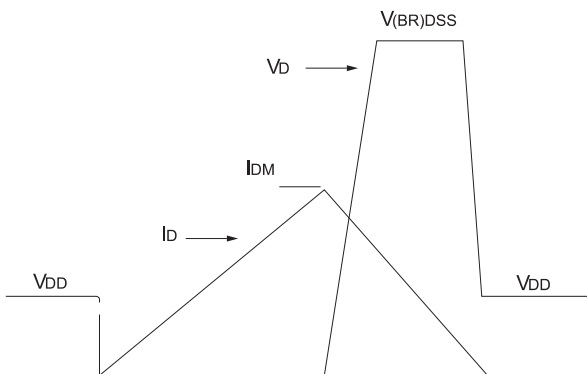
**Figure 14 Test circuit for inductive load switching and diode recovery times**



**Figure 15: Unclamped inductive load test circuit**



**Figure 16: Unclamped inductive waveform**



**Figure 17: Switching time waveform**

