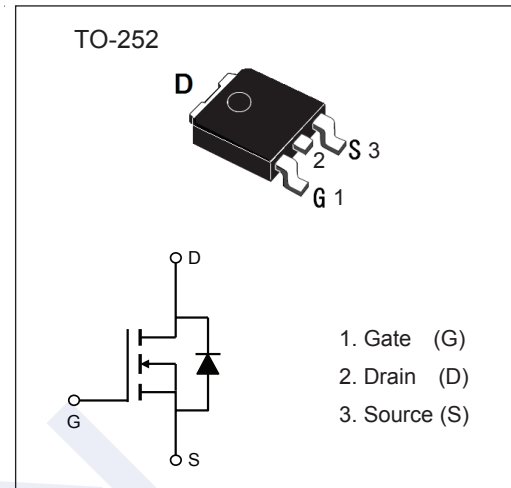


## N-Channel MOSFET

## 2KK5056

## ■ Features

- $V_{DS} (V) = 40 V$
- $I_D = 60 A$
- $R_{DS(ON)}$  (at  $V_{GS} = 10 V$ )  $< 8 m\Omega$
- $R_{DS(ON)}$  (at  $V_{GS} = 4.5 V$ )  $< 10.5 m\Omega$

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

Parameter	Symbol	Rating	Unit
Drain-Source Voltage	$V_{DS}$	40	V
Gate-Source Voltage	$V_{GS}$	$\pm 20$	
Continuous Drain Current	$I_D$	60	A
Pulsed Drain Current (Note 1)	$I_{DM}$	200	
Single Pulse Avalanche Energy (Note 2)	$E_{AS}$	142	mJ
Peak Diode Recovery $dv/dt$ (Note 3)	$dv/dt$	7	V/ns
Power Dissipation	$P_D$	40	W
Thermal Resistance, Junction- to-Ambient	$R_{\theta JA}$	110	$^\circ C/W$
Thermal Resistance, Junction- to-Case	$R_{\theta JC}$	3.125	
Junction Temperature	$T_J$	150	$^\circ C$
Storage Temperature Range	$T_{stg}$	-55 to 150	

## Notes:

1. Repetitive Rating: Pulse width limited by maximum junction temperature.
2.  $V_{DD}=25V, L=0.1mH, I_{AS}=53.2A, R_G=25\Omega$ , Starting  $T_J = 25^\circ C$ .
3.  $I_{SD} \leq 30A, di/dt \leq 200A/\mu s, V_{DD} \leq BV_{DSS}$ , Starting  $T_J = 25^\circ C$ .

## N-Channel MOSFET

## 2KK5056

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

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Off Characteristics						
Drain-Source Breakdown Voltage	BV <sub>DSS</sub>	I <sub>D</sub> = 250 μA, V <sub>GS</sub> = 0V	40			V
Zero Gate Voltage Drain Current	I <sub>DSS</sub>	V <sub>DS</sub> = 40 V, V <sub>GS</sub> = 0 V			1	μA
		V <sub>DS</sub> = 32 V, V <sub>GS</sub> = 0 V, T <sub>J</sub> = 125°C			10	
Gate to Source Leakage Current	I <sub>GSS</sub>	V <sub>DS</sub> = 0 V, V <sub>GS</sub> = ±20 V			±100	nA
On Characteristics (Note 1)						
Gate to Source Threshold Voltage	V <sub>GS(th)</sub>	V <sub>DS</sub> = V <sub>GS</sub> , I <sub>D</sub> = 250μA	1.0		2.5	V
Static Drain-Source On-Resistance	R <sub>DS(on)</sub>	V <sub>GS</sub> = 10 V, I <sub>D</sub> = 25 A			8	mΩ
		V <sub>GS</sub> = 4.5 V, I <sub>D</sub> = 20 A			10.5	
Dynamic Characteristics (Note 1)						
Input Capacitance	C <sub>iss</sub>	V <sub>GS</sub> = 0 V, V <sub>DS</sub> = 20 V, f = 1 MHz		4500		pF
Output Capacitance	C <sub>oss</sub>			800		
Reverse Transfer Capacitance	C <sub>rss</sub>			350		
Switching Characteristics (Note 1)						
Total Gate Charge	Q <sub>g</sub>	V <sub>GS</sub> = 10V, V <sub>DS</sub> = 32 V, I <sub>D</sub> = 50 A (Note 2)		82		nC
Gate Source Charge	Q <sub>gs</sub>			24		
Gate Drain Charge	Q <sub>gd</sub>			18		
Turn-On Delay Time	t <sub>d(on)</sub>	V <sub>GS</sub> = 10V, V <sub>DD</sub> = 20 V, I <sub>D</sub> = 50A, R <sub>G</sub> = 25 Ω (Note 2)		40		ns
Turn-On Rise Time	t <sub>r</sub>			50		
Turn-Off Delay Time	t <sub>d(off)</sub>			204		
Turn-Off Fall Time	t <sub>f</sub>			120		
Drain-Source Diode Characteristics						
Body Diode Reverse Recovery Time	t <sub>rr</sub>	I <sub>S</sub> = 30A, di/dt = 100 A/μs		53		ns
Body Diode Reverse Recovery Charge	Q <sub>rr</sub>			80		nC
Maximum Body-Diode Continuous Current	I <sub>S</sub>	V <sub>G</sub> =V <sub>D</sub> =0V, Force Current			50	A
Diode Forward Voltage	V <sub>SD</sub>	V <sub>GS</sub> = 0 V, I <sub>S</sub> = 1 A			1	V

## Notes:

1. Pulse Test: Pulse Width ≤ 300μs, Duty Cycle ≤ 2%.
2. Essentially independent of operating ambient temperature.

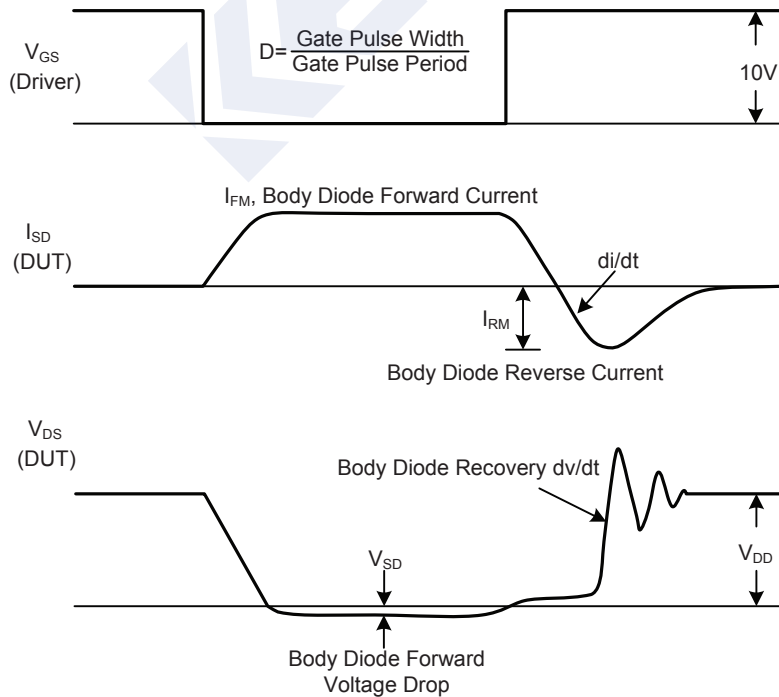
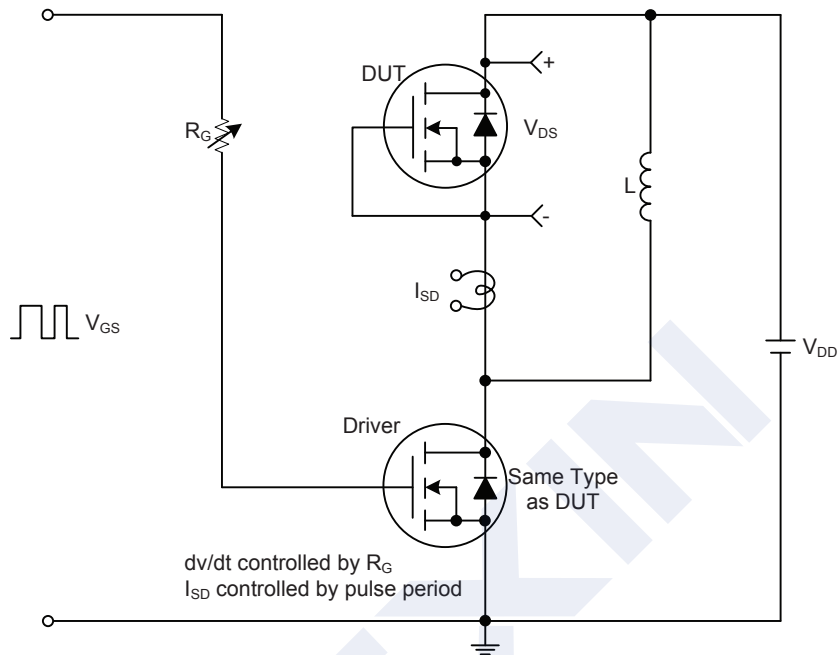
## ■ Marking

Marking	K5056 KC***
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### N-Channel MOSFET

### 2KK5056

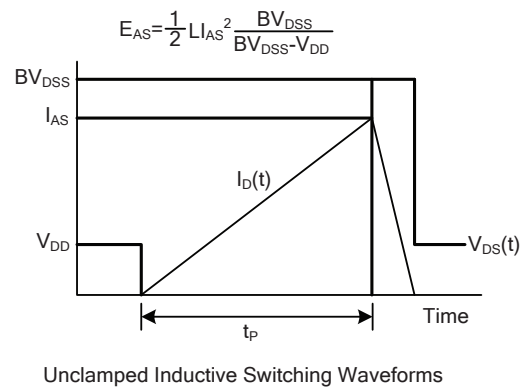
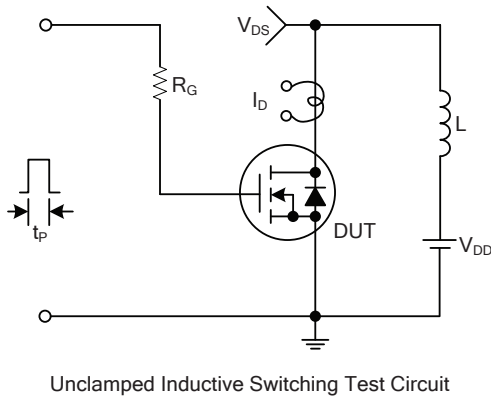
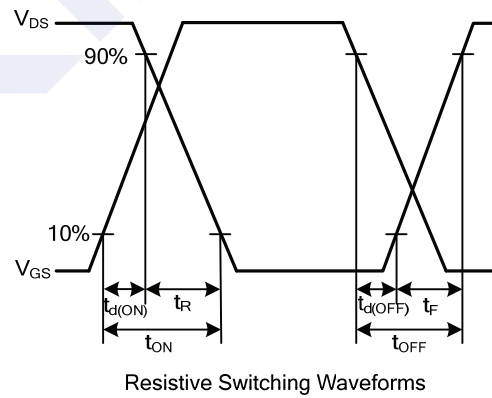
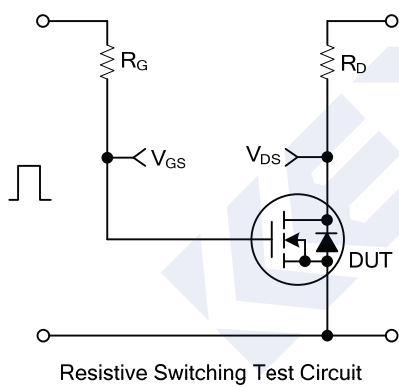
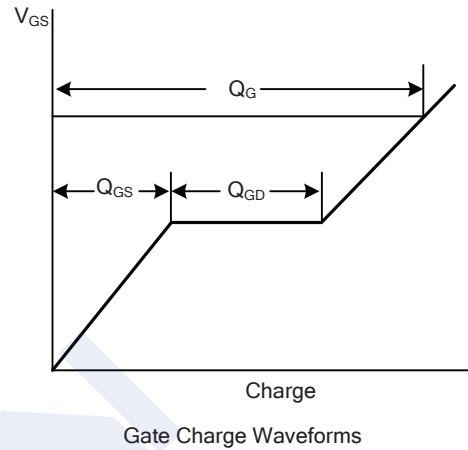
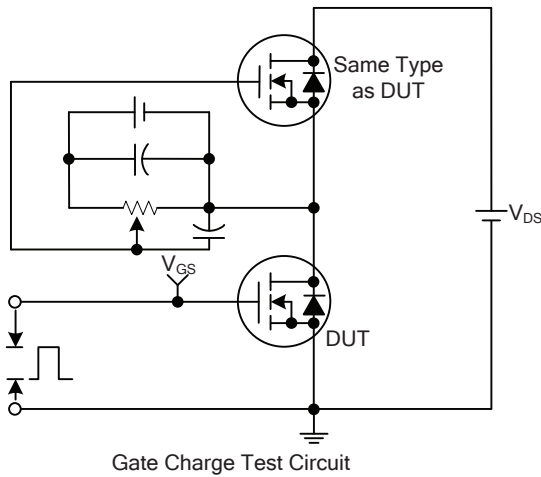
■ Test Circuits And Waveforms



Peak Diode Recovery dv/dt Test Circuit and Waveforms

### N-Channel MOSFET

### 2KK5056



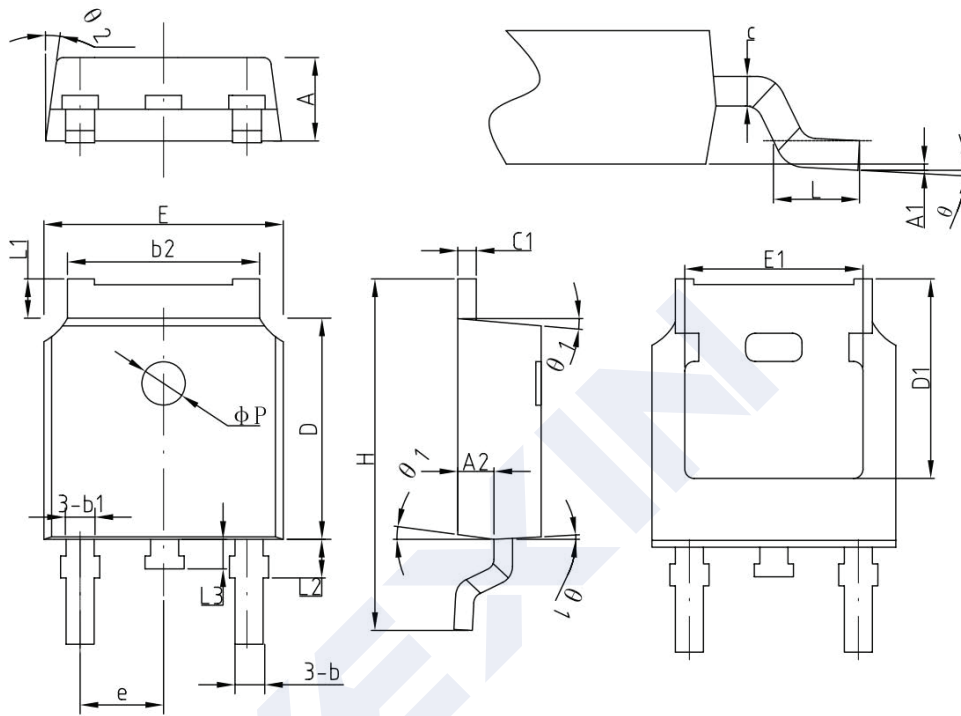
## N-Channel MOSFET

## 2KK5056

## ■ Package Dimension

TO-252

Units: mm



COMMON DIMENSIONS  
(UNITS OF MEASURE=MILLIMETER)

SYMBOL	MIN	NOM	MAX
A	2.2	2.30	2.38
A1	0	—	0.10
A2	0.90	1.01	1.10
b	0.71	0.76	0.86
b1		0.76	
b2	5.13	5.33	5.46
c	0.47	0.50	0.60
c1	0.47	0.50	0.60
D	6.0	6.10	6.20
D1	—	5.30	—
E	6.50	6.60	6.70
E1	—	4.80	—
e	2.286BSC		
H	9.70	10.10	10.40
L	1.40	1.50	1.70
L1	0.90	—	1.25
L2		1.05	
L3		0.8	
φP		1.2	
θ	0°	—	8°
θ1	5°	7°	9°
θ2	5°	7°	9°