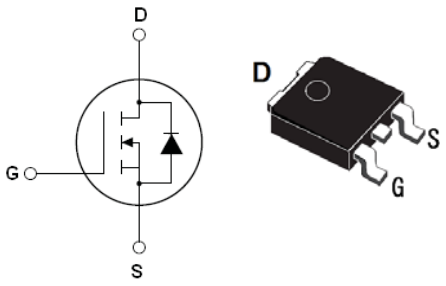
N-Channel MOSFET

2KK5053

■ Features

- $V_{DS\ (V)}$ = 250 V
- I_D = 18 A
- $R_{DS(ON)}$ (at V_{GS} = 10 V) <230 mΩ
- Low gate charge
- Low Crss (typical 12.2pF)
- Fast switching
- 100% avalanche tested
- Improved dv/dt capability

TO-252



■ Absolute Maximum Ratings (T_C = 25℃ unless otherwise noted)

Parameter		Symbol	Rating	Unit
Drain-Source Voltage		V_{DS}	250	V
Gate-Source Voltage		V_{GS}	±30	
Continuous Drain Current (Note 1)	T_C = 25℃	I_D	18	A
	T_C = 100℃		10.97	
Pulsed Drain Current (Note 1)		I_{DM}	72	
Single Pulse Avalanche Energy (Note 2)		E_{AS}	607.5	mJ
Avalanche Current（Note 1）		I_{AR}	18	A
Repetitive Avalanche Current（Note 1）		E_{AR}	3.21	mJ
Peak Diode Recovery dv/dt（Note 3）		dv/dt	4.3	V/ns
Power Dissipation		P_D	120	W
Thermal Resistance, Junction- to-Case		$R_{\theta JC}$	1.04	℃/W
Thermal Resistance, Junction- to-Ambient		$R_{\theta JA}$	110	
Junction Temperature		T_J	150	℃
Storage Temperature Range		T_{stg}	-55 to 150	

Notes:

1. Drain current limited by maximum junction temperature
2. L=3mH, I_{AS}=18A, V_{DD}=50V, R_G=25 Ω ,Starting T_J=25℃
3. I_{SD} ≤40A,di/dt ≤300A/μs,V_{DD}≤BV_{DSS}, Starting T_J=25℃

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■ Electrical Characteristics (T_C = 25℃ unless othewise specified)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Off Characteristics						
Drain-Source Breakdown Voltage	BV_{DSS}	I_D = 250 μA, V_{GS} = 0V	250			V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS} = 250 V, V_{GS} = 0 V			1	μA
		V_{DS} = 200 V, V_{GS} = 0 V, T_J = 125°C			10	
Gate to Source Leakage Current	I_{GSS}	V_{DS} = 0 V, V_{GS} = ±30 V			±100	nA
On Characteristics						
Gate to Source Threshold Voltage	$V_{GS(th)}$	V_{DS} = V_{GS} , I_D = 250μA	2		4	V
Static Drain-Source On-Resistance	$R_{DS(ON)}$	V_{GS} = 10 V, I_D = 9 A		160	230	mΩ
Forward Transconductance (Note 4)	g_{FS}	V_{DS} = 40 V, I_D = 18 A		9.7		S
Dynamic Characteristics						
Input Capacitance	C_{iss}	V_{GS} = 0 V, V_{DS} = 25 V, f = 1 MHz		703.4	1150	pF
Output Capacitance	C_{oss}			178.8	285	
Reverse Transfer Capacitance	C_{rss}			12.2	21.4	
Switching Characteristics						
Total Gate Charge	Q_g	V_{GS} = 10V, V_{DS} = 200 V, I_D = 18 A (Note 4,5)		17.5	25.4	nC
Gate Source Charge	Q_{gs}			4.08		
Gate Drain Charge	Q_{gd}			9.12		
Turn-On DelayTime	$t_{d(on)}$	V_{GS} = 10V, V_{DD} = 125 V, I_D = 18A, R_G = 25 Ω (Note 4,5)		8	22	ns
Turn-On Rise Time	t_r			46	93.5	
Turn-Off DelayTime	$t_{d(off)}$			39	76.1	
Turn-Off Fall Time	t_f			37.4	69.1	
Drain-Source Diode Characteristics						
Body Diode Reverse Recovery Time	t_{rr}	I_F = 18 A, dI/dt = 100 A/μs, V_{GS} = 0V (Note 4)		157		ns
Body Diode Reverse Recovery Charge	Q_{rr}			0.89		nC
Diode Forward Voltage	V_{SD}	V_{GS} = 0 V, Is = 18 A			1.4	V

Notes:

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

■ Marking

Marking	K5053

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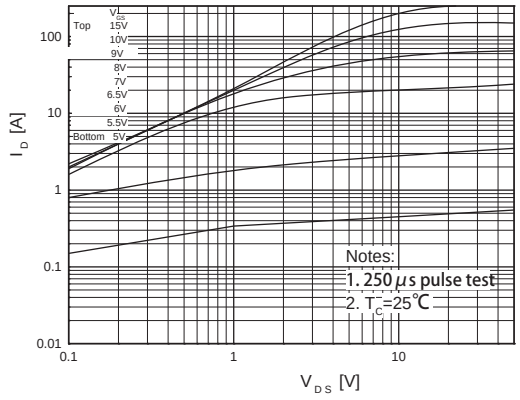
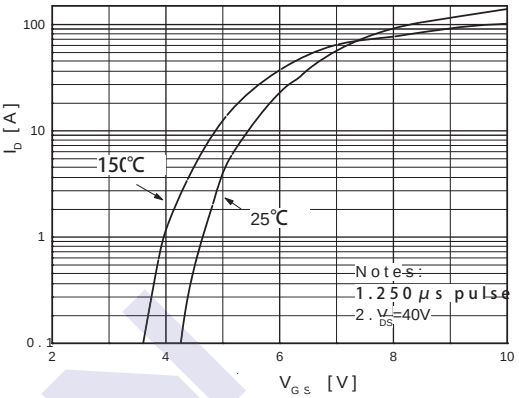
■ Typical Characterisitics

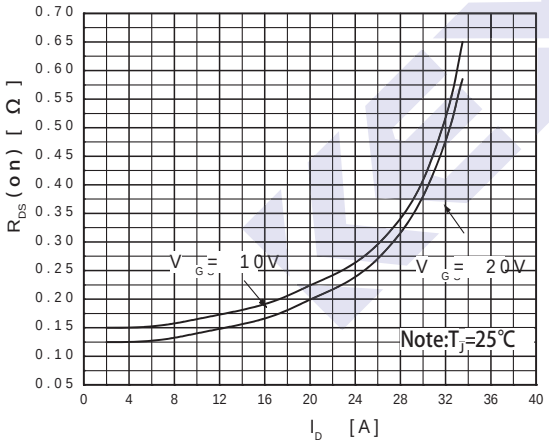
On-Region Characteristics



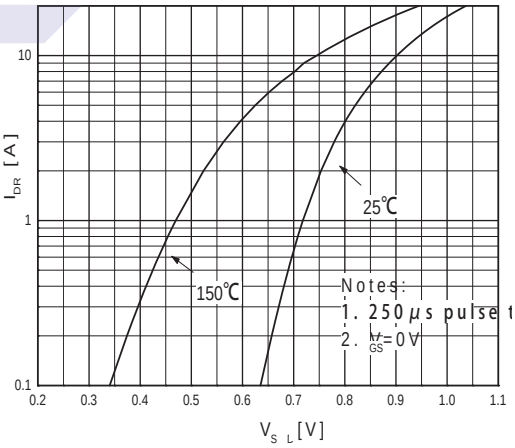
Transfer Characteristics



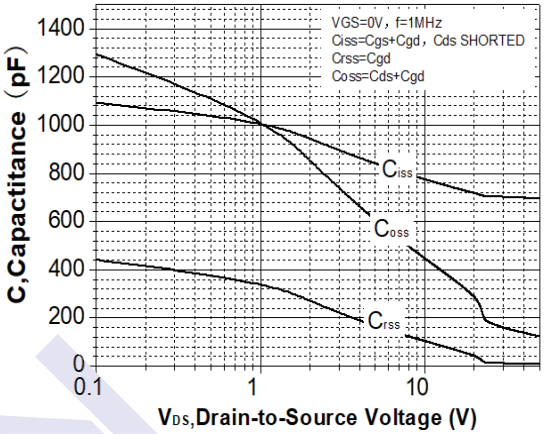
On-Resistance Variation vs. Drain Current and Gate Voltage



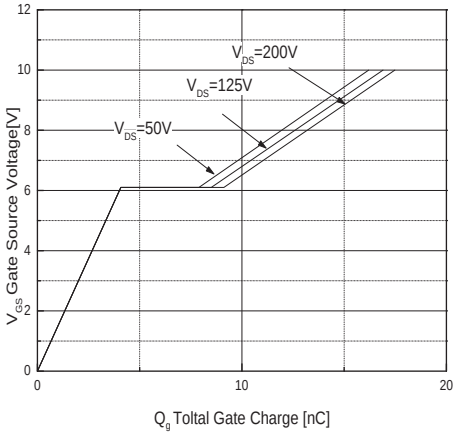
Body Diode Forward Voltage Variation vs. Source Current and Temperature



Capacitance Characteristics



Gate Charge Characteristics



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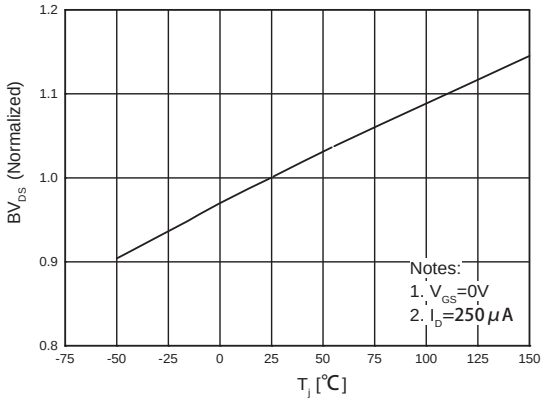
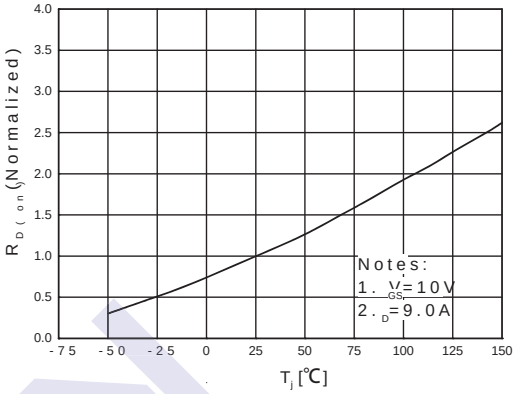
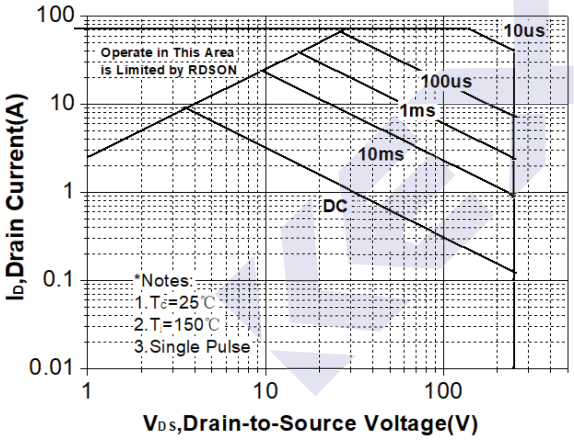
Breakdown Voltage Variation vs. Temperature



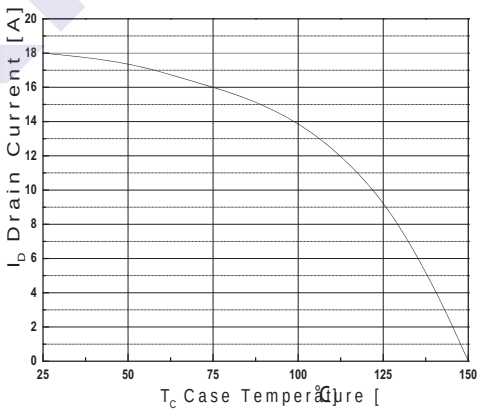
On-Resistance Variation vs. Temperature



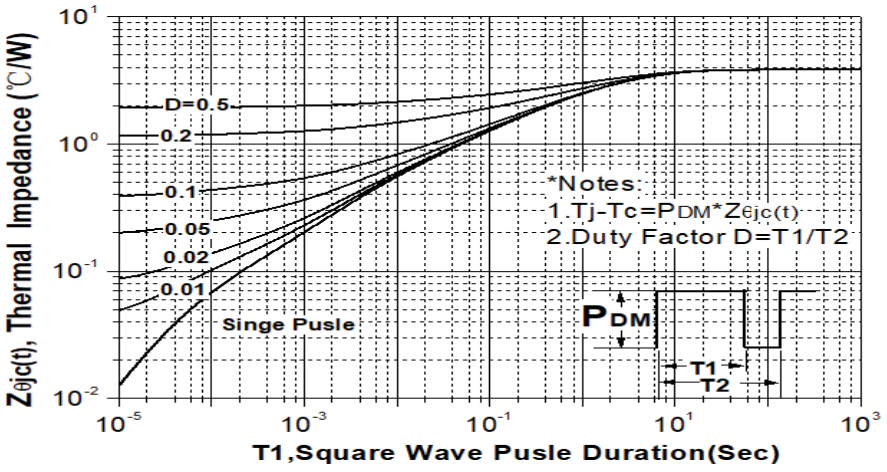
Maximum Safe Operating Area



Maximum Drain Current vs. Case Temperature



Transient Thermal Response Curve



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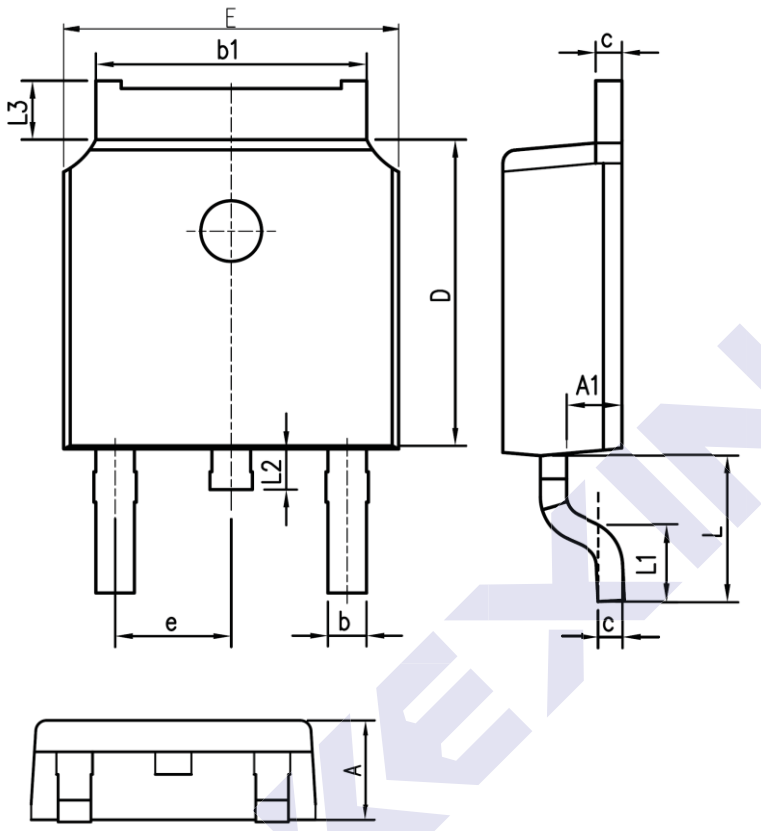
■ Package Outline Dimensions

Unit:mm



SYMBOL	mm	
	MIN	MAX
A	2.10	2.50
A1	0.97	1.17
b	0.63	0.93
b1	5.13	5.53
c	0.40	0.60
D	5.80	6.40
E	6.30	6.90
e	2.286BSC	
L	2.50	3.30
L1	1.20	1.80
L2	0.60	1.00
L3	0.85	1.30