

SK05N120B-TF

1200V N-CHANNEL MOSFET

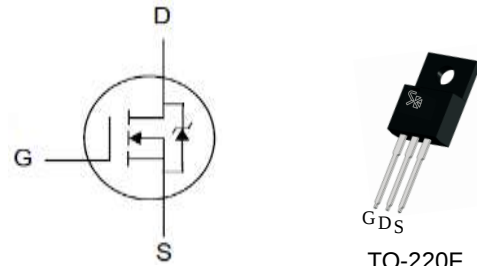
Description

- Proprietary Trench Gate Device Design and Processes
- High Reliability Capability
- RoHS Compliant

BV_{DSS}	$R_{DS(ON),typ.}$	I_D
1200V	3.0Ω	5A

Features

- $BV_{DSS} \geq 1200V$
- $I_D = 5A$
- $R_{DS(ON)} \leq 4.9\Omega @ V_{GS}=10V$
- Low Gate Charge Minimize Switching Loss



Package No to Scale

Applications

- Power switching application
- Hard Switched and High Frequency Circuits
- Uninterruptible Power Supply

Ordering Information

Part Number	Package
SK05N120B-TF	TO-220F

Absolute Maximum Ratings

$T_A=25^\circ\text{C}$ unless otherwise specified

Symbol	Parameter		SK05N120B-TF	Unit
V_{DSS}	Drain-to-Source Voltage		1200	V
V_{GSS}	Gate-to-Source Voltage		± 30	V
I_D	Continuous Drain Current		5	A
P_D	Power Dissipation ^[2]	$T_C = 25^\circ\text{C}$	37	W
T_J & T_{STG}	Operating and Storage Temperature Range		-55 to +150	$^\circ\text{C}$

Caution: Stresses greater than those listed in the "Absolute Maximum Ratings" may cause permanent damage to the device.

Thermal Characteristics

Symbol	Parameter	SK05N120B-TF	Unit
$R_{\theta JC}$	Thermal Resistance, Junction-to-Case	3.37	$^\circ\text{C/W}$



Electrical Characteristics

OFF Characteristics $T_J = 25^\circ\text{C}$ unless otherwise specified

Symbol	Parameter	Min.	Typ.	Max.	Unit	Test Conditions
BV_{DSS}	Drain-to-Source Breakdown Voltage	1200	--	--	V	$V_{GS}=0V, I_D=250\mu A$
I_{DSS}	Drain-to-Source Leakage Current	--	--	1	μA	$V_{DS}=1200V, V_{GS}=0V$
I_{GSS}	Gate-to-Source Leakage Current	--	--	+100	nA	$V_{GS}=+30V, V_{DS}=0V$
		--	--	-100		$V_{GS}=-30V, V_{DS}=0V$

ON Characteristics $T_J = 25^\circ\text{C}$ unless otherwise specified

Symbol	Parameter	Min.	Typ.	Max.	Unit	Test Conditions
$R_{DS(ON)}$	Static Drain-to-Source On-Resistance	--	3.0	4.9	Ω	$V_{GS}=10V, I_D=1A$
$V_{GS(TH)}$	Gate Threshold Voltage	2.5	3.5	4.5	V	$V_{DS}=V_{GS}, I_D=250\mu A$
gfs	Forward Transconductance	--	5	--	S	$V_{DS}=15V, I_D=1.75A$

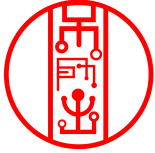
Dynamic Characteristics Essentially independent of operating temperature

Symbol	Parameter	Min.	Typ.	Max.	Unit	Test Conditions
Rg	Gate Resistance	--	2.0	--	Ω	
C_{iss}	Input Capacitance	--	1780	--	pF	$V_{GS}=0V,$ $V_{DS}=25V,$ $f=1MHz$
C_{rss}	Reverse Transfer Capacitance	--	12	--		
C_{oss}	Output Capacitance	--	110	--		
Q_g	Total Gate Charge	--	43	--	nC	$V_{DS}=900V,$ $I_D=3.5A, V_{GS}=10V$
Q_{gs}	Gate-to-Source Charge	--	8	--		
Q_{gd}	Gate-to-Drain (Miller) Charge	--	19	--		

Source-Drain Body Diode Characteristics $T_J = 25^\circ\text{C}$ unless otherwise specified

Symbol	Parameter	Min	Typ.	Max.	Unit	Test Conditions
V_{SD}	Diode Forward Voltage	--	0.7	1.5	V	$I_S=1A, V_{GS}=0V$

Note: [1]Current may be limited by junction temperature.
[2]The power dissipation is limited by 150°C junction temperature.



Typical Characteristics

Figure 1. On-Region Characteristics

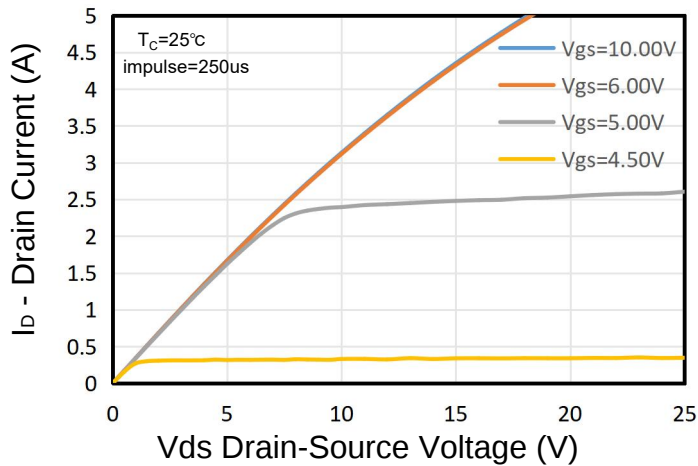


Figure 2. Transfer Characteristics

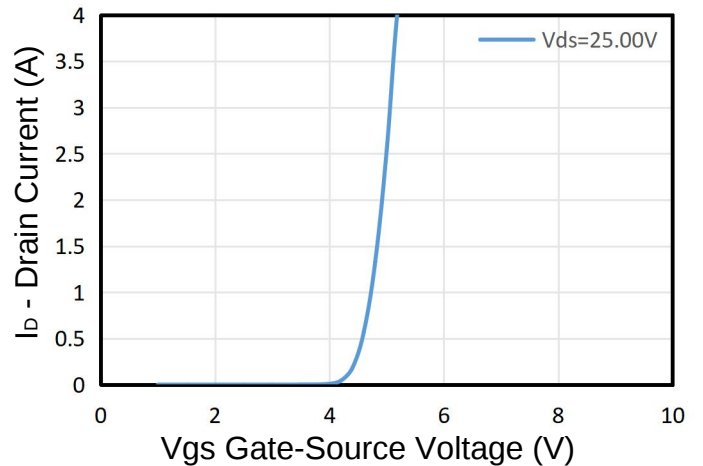


Figure 3. On-Resistance Variation vs Drain Current and Gate Voltage

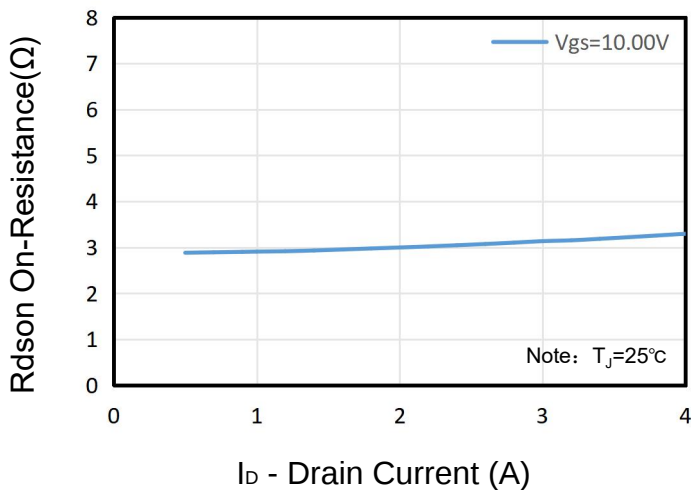


Figure 4. Body Diode Forward Voltage Variation with Source Current

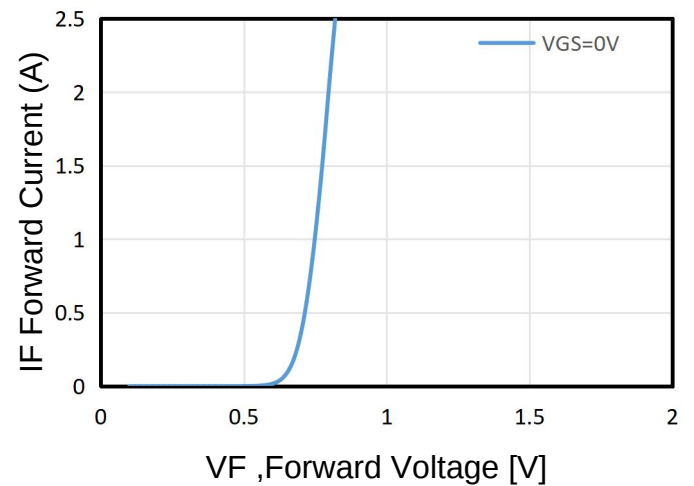


Figure 5. Capacitance Characteristics

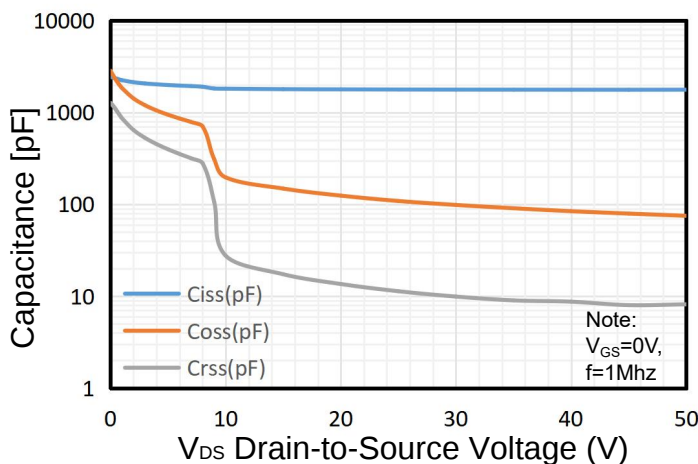
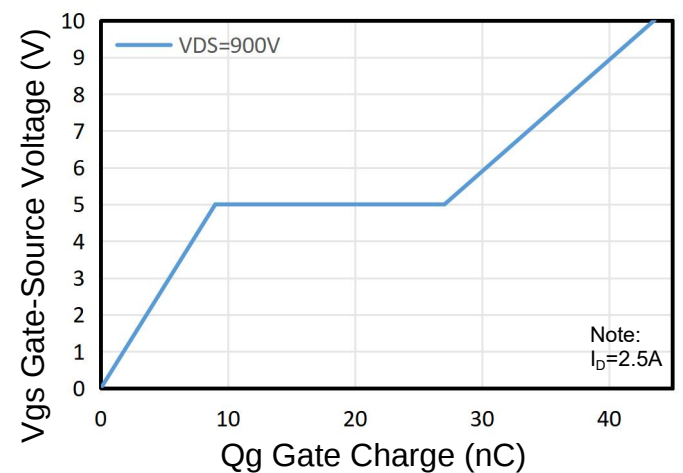
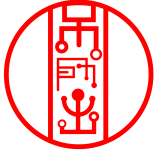


Figure 6. Gate Charge Characteristics





Typical Characteristics

Figure 7. Vds Drain-Source Voltage vs Gate Voltage

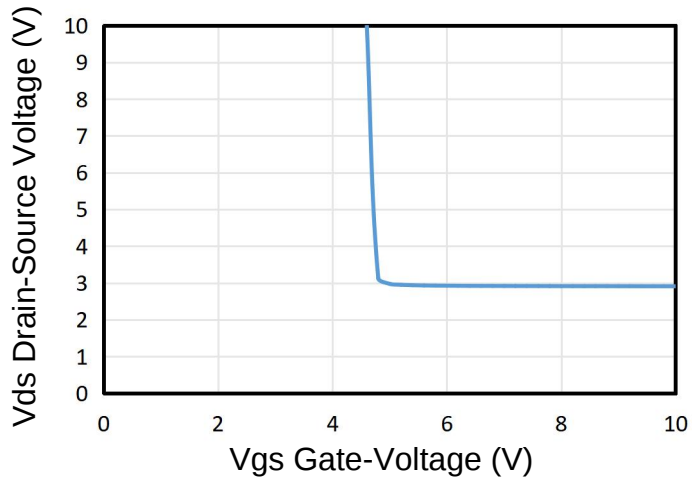
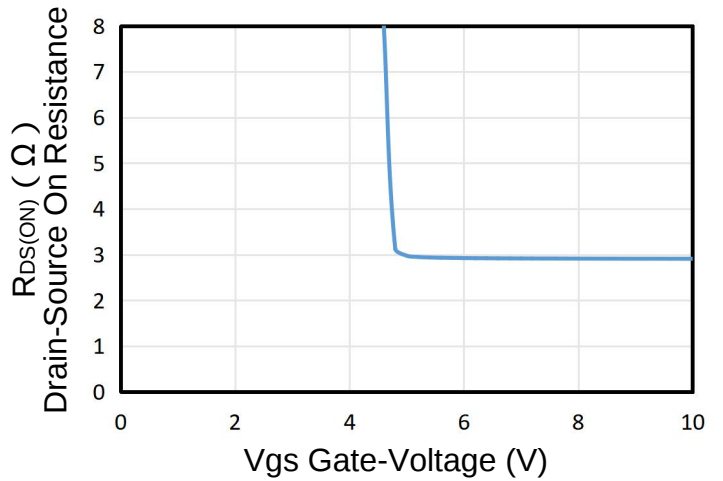
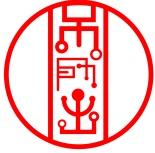


Figure 8. On-Resistance vs Gate Voltage

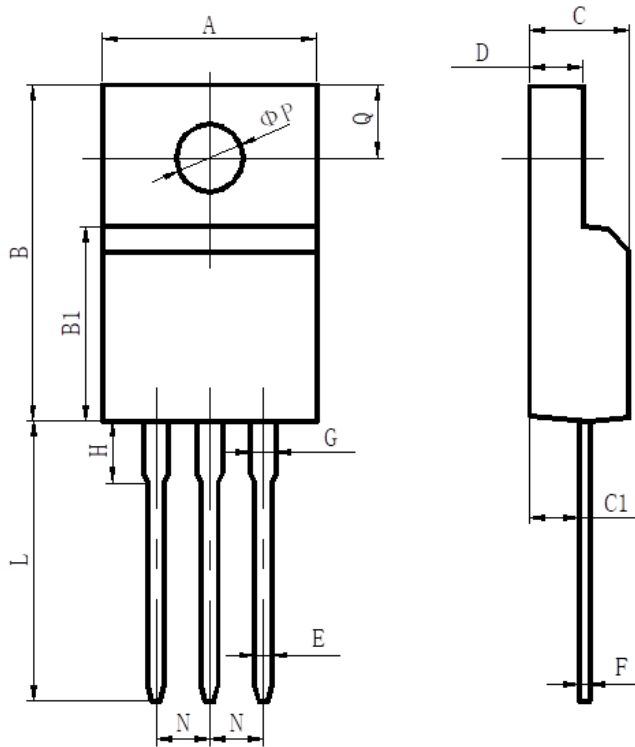




SK05N120B-TF

Package Outline

TO-220F



	Unit (mm)	
	MIN	MAX
A	9.70	10.30
B	15.50	16.10
B1	8.99	9.39
C	4.40	4.80
C1	2.15	2.55
D	2.50	2.90
E	0.70	0.90
F	0.40	0.60
G	1.12	1.42
H	3.40	3.80
L	12.6	13.6
N	2.34	2.74
Q	3.15	3.55
Φ P	3.00	3.30