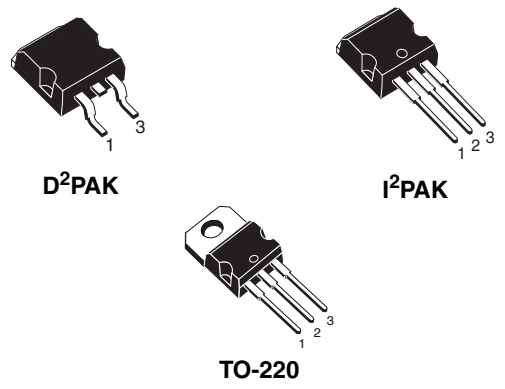
STP55NF06L
STB55NF06L - STB55NF06L-1

N-channel 60V - 0.014Ω - 55A TO-220/D^2PAK/I^2PAK
STripFET™ II Power MOSFET

General features

Type	V_{DSS}	$R_{DS(on)}$	I_D
STP55NF06L	60V	<0.018Ω	55A
STB55NF06L	60V	<0.018Ω	55A
STB55NF06L-1	60V	<0.018Ω	55A

- Exceptional dv/dt capability
- 100% avalanche tested
- Application oriented characterization



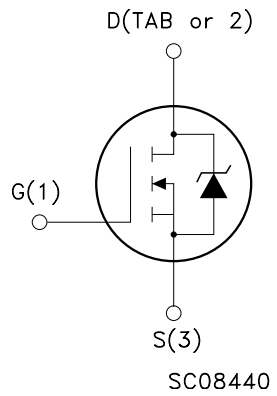
Description

This Power MOSFET is the latest development of STMicroelectronis unique "Single Feature Size™" strip-based process. The resulting transistor shows extremely high packing density for low on-resistance, rugged avalanche characteristics and less critical alignment steps therefore a remarkable manufacturing reproducibility.

Applications

- Switching application

Internal schematic diagram



Order codes

Part number	Marking	Package	Packaging
STP55NF06L	P55NF06L	TO-220	Tube
STB55NF06LT4	B55NF06L	D^2PAK	Tape & reel
STB55NF06L-1	B55NF06L	I^2PAK	Tube

1 Electrical ratings

Table 1. Absolute maximum ratings

Symbol	Parameter	Value	Unit
V_{DS}	Drain-source voltage (V_{GS} = 0)	60	V
V_{GS}	Gate-source voltage	± 16	V
I_D	Drain current (continuous) at T_C = 25°C	55	A
I_D	Drain current (continuous) at T_C = 100°C	39	A
I_{DM}(1)	Drain current (pulsed)	220	A
P_{TOT}	Total dissipation at T_C = 25°C	95	W
	Derating factor	0.63	W/°C
dv/dt(2)	Peak diode recovery voltage slope	20	V/ns
E_{AS}(3)	Single pulse avalanche energy	300	mJ
T_J T_{stg}	Operating junction temperature Storage temperature	-55 to 175	°C

1. Pulse width limited by safe operating area
2. I_{SD} ≤55A, di/dt ≤200A/µs, V_{DD} ≤$V_{(BR)DSS}$, T_j ≤T_{JMAX}.
3. Starting T_j = 25 °C, I_D = 27.5A, V_{DD}= 30V.

Table 2. Thermal data

$R_{thj-case}$	Thermal resistance junction-case max	1.58	°C/W
R_{thj-a}	Thermal resistance junction-ambient max	62.5	°C/W
T_l	Maximum lead temperature for soldering purpose	300	°C

2 Electrical characteristics

(T_{CASE}=25°C unless otherwise specified)

Table 3. On/off states

Symbol	Parameter	Test conditions	Min.	Typ.	Max.	Unit
$V_{(BR)DSS}$	Drain-source breakdown voltage	I_D = 250µA, V_{GS}= 0	60			V
I_{DSS}	Zero gate voltage drain current (V_{GS} = 0)	V_{DS} = Max rating, V_{DS} = Max rating @125°C			1 10	µA µA
I_{GSS}	Gate body leakage current (V_{DS} = 0)	V_{GS} = ±16V			±100	nA
$V_{GS(th)}$	Gate threshold voltage	V_{DS}= V_{GS}, I_D = 250µA	1	1.7		V
$R_{DS(on)}$	Static drain-source on resistance	V_{GS}= 5V, I_D= 27.5A V_{GS}= 10V, I_D= 27.5A		0.016 0.014	0.020 0.018	Ω Ω

Table 4. Dynamic

Symbol	Parameter	Test conditions	Min.	Typ.	Max.	Unit
g_{fs} (1)	Forward transconductance	V_{DS} =15V, I_D = 27.5A		30		S
C_{iss} C_{oss} C_{rss}	Input capacitance Output capacitance Reverse transfer capacitance	V_{DS} =25V, f=1 MHz, V_{GS}=0		1700 300 105		pF pF pF
Q_g Q_{gs} Q_{gd}	Total gate charge Gate-source charge Gate-drain charge	V_{DD}=48V, I_D = 55A V_{GS} =4.5V		27 7 10	37	nC nC nC

1. Pulsed: pulse duration=300µs, duty cycle 1.5%

Table 5. Switching times

Symbol	Parameter	Test conditions	Min.	Typ.	Max.	Unit
$t_{d(on)}$ t_r	Turn-on delay time Rise time	V_{DD}=30 V, I_D=27.5A, R_G=4.7Ω, V_{GS}= 4.5V		20 100		ns ns
$t_{d(off)}$ t_f	Turn-off delay time Fall time	V_{DD}=30V, I_D=27.5A, R_G=4.7Ω, V_{GS}=4.5V		40 20		ns ns

Table 6. Source drain diode

Symbol	Parameter	Test conditions	Min	Typ.	Max	Unit
I_{SD}	Source-drain current				12	A
I_{SDM}(1)	Source-drain current (pulsed)				48	A
V_{SD}(2)	Forward on voltage	I_{SD} = 55A, V_{GS}=0			1.6	V
t_{rr} Q_{rr} I_{RRM}	Reverse recovery time Reverse recovery charge Reverse recovery current	I_{SD} = 55A, di/dt = 100A/µs, V_{DD} = 30V, Tj = 150°C		80 200 5		ns nC A

1. Pulse width limited by safe operating area
2. Pulsed: pulse duration=300µs, duty cycle 1.5%

2.1 Electrical characteristics (curves)

Figure 1. Safe operating area

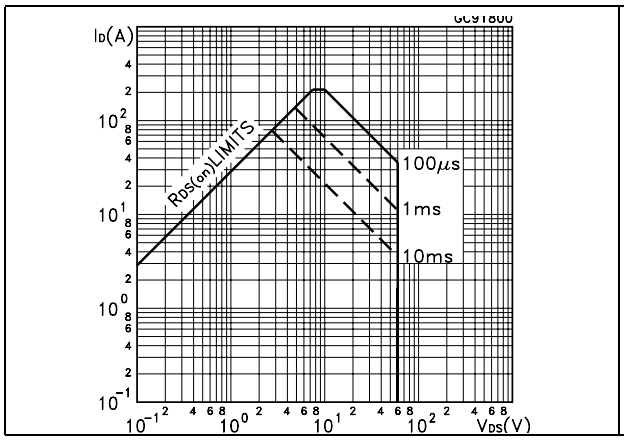


Figure 2. Thermal impedance

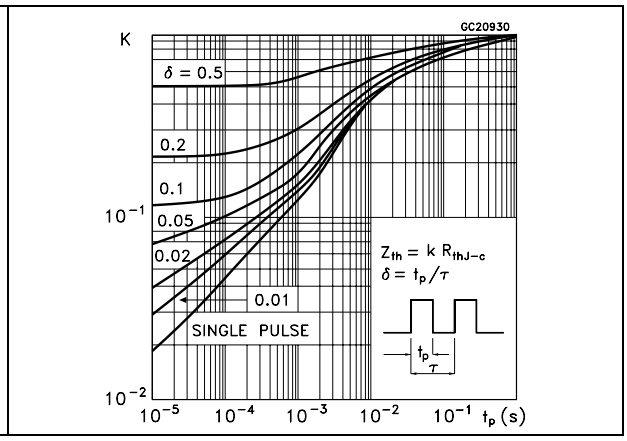


Figure 3. Output characterisics

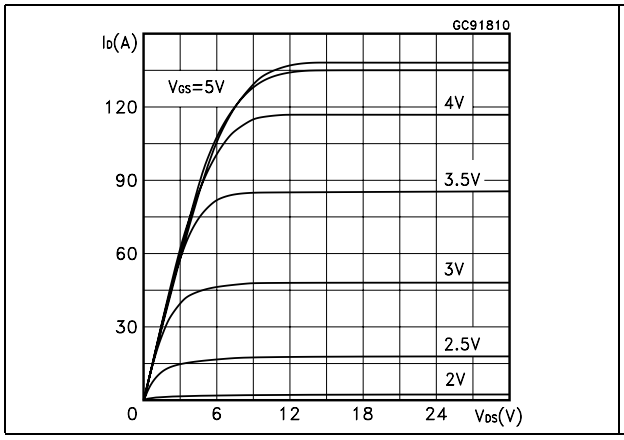


Figure 4. Transfer characteristics

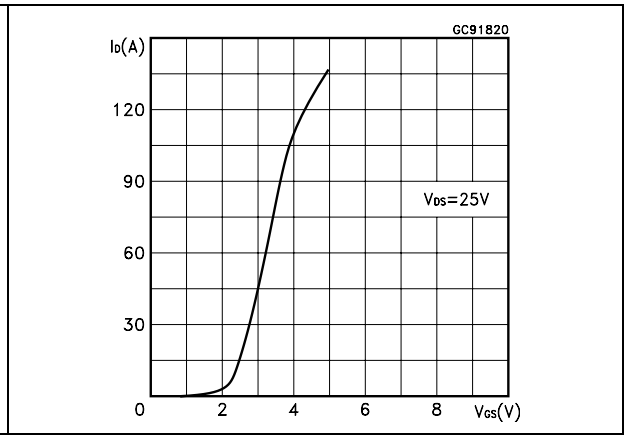


Figure 5. Transconductance

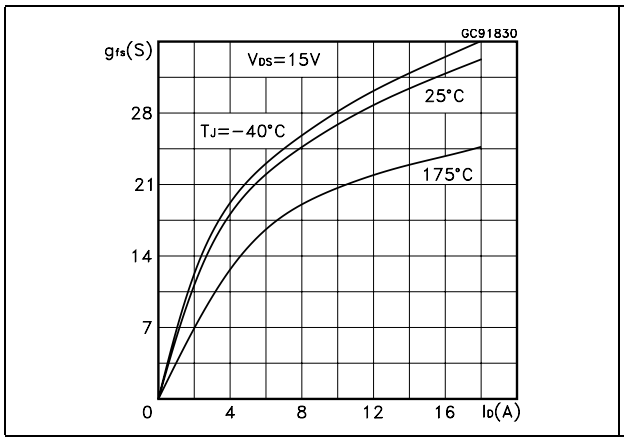


Figure 6. Static drain-source on resistance