

N-channel 60V - 0.032Ω - 30A - TO-220 - D²PAK
 STripFET™ II Power MOSFET

General features

Type	V _{DSS}	R _{DS(on)}	I _D
STP36NF06L	60V	< 0.04Ω	30A
STB36NF06L	60V	< 0.04Ω	30A

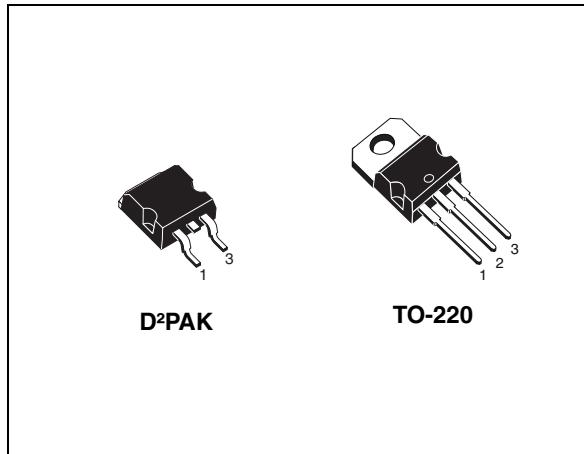
- Exceptional dv/dt capability
- 100% avalanche tested
- Low threshold drive

Description

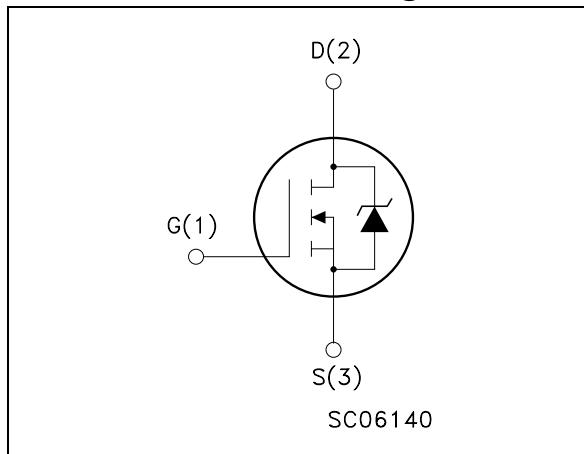
This Power MOSFET is the latest development of STMicroelectronics unique "Single Feature Size™" strip-based process. The resulting transistor shows extremely high packing density for low on-resistance, rugged avalanche characteristics and less critical alignment steps therefore a remarkable manufacturing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

Applications

- Switching application



Internal schematic diagram



Order codes

Sales type	Marking	Package	Packaging
STP36NF06L	P36NF06L	TO-220	Tube
STB36NF06L	B36NF06	D ² PAK	Tape & reel

1 Electrical ratings

Table 1. Absolute maximum ratings

Symbol	Parameter	Value	Unit
V_{DS}	Drain-source Voltage ($V_{GS}=0$)	60	V
V_{DGR}	Drain-gate voltage ($R_{GS}=20K\Omega$)	60	V
V_{GS}	Gate-source voltage	± 18	V
I_D	Drain-current (continuos) at $T_c=25^\circ C$	30	A
I_D	Drain-current (continuos) at $T_c=100^\circ C$	21	A
$I_{DM}^{(1)}$	Drain-current (pulsed)	120	A
P_{TOT}	Total dissipation at $T_c=25^\circ C$	70	W
	Derating factor	0.47	W/ $^\circ C$
$dv/dt^{(2)}$	Peak diode recovery voltage slope	10	V/ns
$E_{AS}^{(3)}$	Single pulse avalanche energy	225	mJ
T_j T_{stg}	Operating junction temperature Storage temperature	-55 to 175	$^\circ C$

1. Pulse width limited by safe operating area.
2. $I_{SD} \leq 30A$, $di/dt \leq 400A/\mu s$, $V_{DD} \leq V_{(BR)DSS}$. $T_j \leq T_{jmax}$
3. Starting $T_j=25^\circ C$, $I_D=15A$, $V_{DD}=30V$

Table 2. Thermal resistance

Symbol	Parameter	Value	Unit
$R_{thj-case}$	Thermal resistance junction-case max	2.14	$^\circ C/W$
$R_{thj-amb}$	Thermal resistance junction-ambient (free air) max	62.5	$^\circ C/W$
T_I	Maximum lead temperature for soldering purpose	300	$^\circ C$

2 Electrical characteristics

($T_{CASE}=25^\circ\text{C}$ unless otherwise specified)

Table 3. Static

Symbol	Parameter	Test conditions	Min.	Typ.	Max.	Unit
$V_{(BR)DSS}$	Drain-source breakdown voltage	$I_D=250\mu\text{A}, V_{GS}=0$	60			V
I_{DSS}	Zero gate voltage drain current ($V_{GS}=0$)	$V_{DS}=\text{Max rating}$ $V_{DS}=\text{Max rating } T_c=125^\circ\text{C}$			1 10	μA μA
I_{GSS}	Gate-body leakage current ($V_{DS}=0$)	$V_{GS}=\pm 18\text{V}$			± 100	nA
$V_{GS(th)}$	Gate Threshold Voltage	$V_{DS}=V_{GS}, I_D=250\mu\text{A}$	1		2.5	V
$R_{DS(on)}$	Static drain-source on resistance	$V_{GS}=10\text{V}, I_D=15\text{A}$ $V_{GS}=5\text{V}, I_D=15\text{A}$		0.032 0.045	0.04 0.05	Ω Ω

Table 4. Dynamic

Symbol	Parameter	Test conditions	Min	Typ	Max	Unit
g_{fs}	Forward transconductance	$V_{DS}=15\text{V}, I_D=15\text{A}$		15		S
C_{iss} C_{oss} C_{rss}	Input capacitance Output capacitance Reverse transfer capacitance	$V_{DS}=25\text{V}, f=1\text{MHz}, V_{GS}=0$		660 170 70		pF pF pF
Q_g Q_{gs} Q_{gd}	Total gate charge Gate-source charge Gate-drain charge	$V_{DD}=30\text{V}, I_D=30\text{A}$ $V_{GS}=5\text{V}$		13 4.2 7.8	17	nC nC nC

Table 5. Switching on/off (inductive load)

Symbol	Parameter	Test condicions	Min.	Typ.	Max.	Unit
$t_{d(on)}$ t_r	Turn-on delay Time Rise time	$V_{DD}=30V$, $I_D=15A$ $R_G=4.7\Omega$, $V_{GS}=5V$		10 80		ns ns
$t_{d(off)}$ t_f	Turn-off delay time Fall time	$V_{DD}=30V$, $I_D=15A$ $R_G=4.7\Omega$, $V_{GS}=5V$		19 13		ns ns

Table 6. Source Drain Diode

Symbol	Parameter	Test condicions	Min.	Typ.	Max.	Unit
I_{SD} $I_{SDM}^{(1)}$	Source-drain current Source-drain current (pulsed)				30 120	A A
$V_{SD}^{(2)}$	Forward on voltage	$I_{SD}=24A$, $V_{GS}=0$			1.5	V
t_{rr} Q_{rr} I_{RRM}	Reverse recovery time Reverse recovery charge Reverse recovery current	$I_{SD}=20A$, $V_{DD}=20V$, $di/dt=100A/\mu s$, $T_j=150^\circ C$		55 107 3.9		ns nC A

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

2.1 Electrical characteristics (curves)

Figure 1. Safe operating area

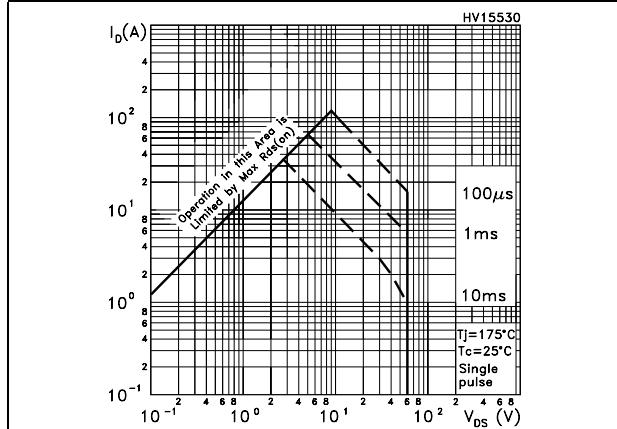


Figure 2. Thermal impedance

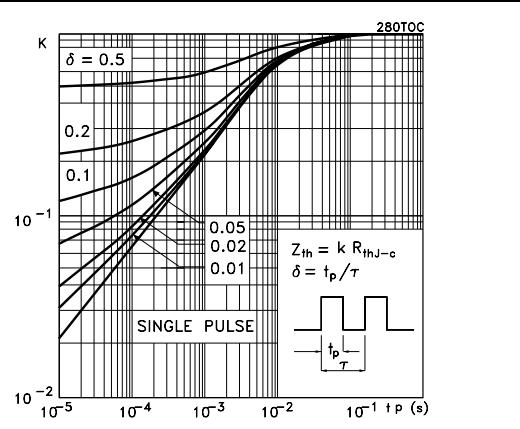


Figure 3. Output characteristics

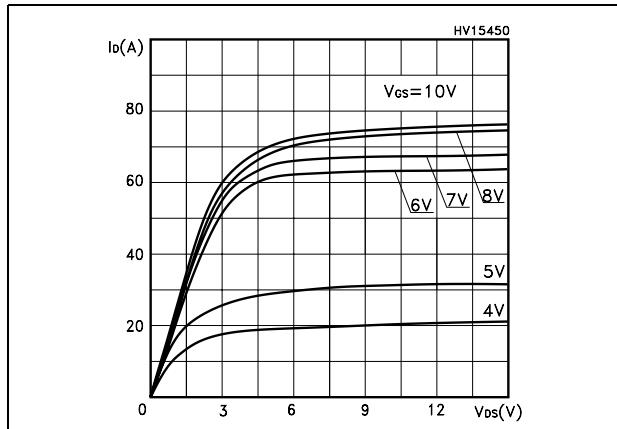


Figure 4. Transfer characteristics

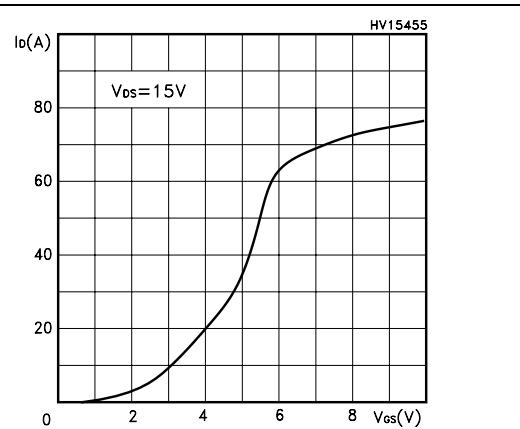


Figure 5. Transconductance

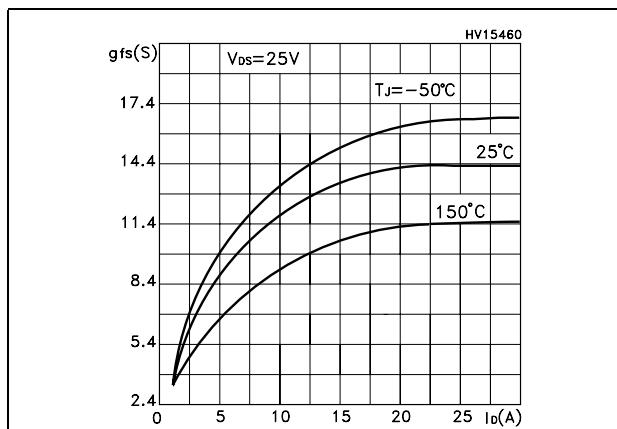


Figure 6. Static drain-source on resistance

