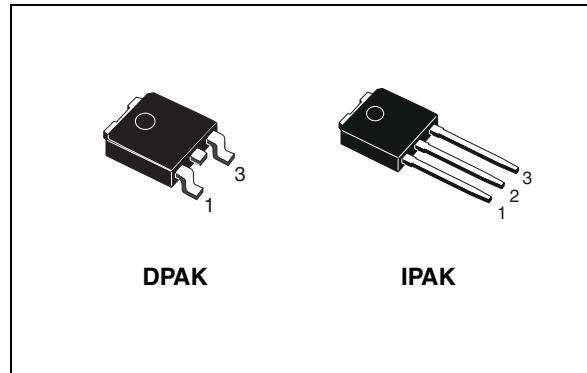


N-channel 60V - 0.08Ω - 12A - DPAK - IPAK
STripFET™ II Power MOSFET

General features

Type	V_{DSS}	$R_{DS(on)}$	I_D
STD12NF06L	60V	<0.1Ω	12A
STD12NF06L-1	60V	<0.1Ω	12A

- Exceptional dv/dt capability
- Low gate charge



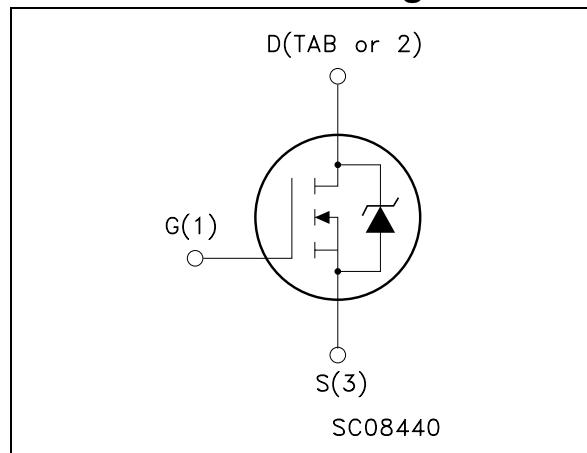
Description

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

Part number	Marking	Package	Packaging
STD12NF06LT4	D12NF06L	DPAK	Tape & reel
STD12NF06L-1	D12NF06L	IPAK	Tube

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	± 16	V
I_D	Drain current (continuous) at $T_C = 25^\circ C$	12	A
I_D	Drain current (continuous) at $T_C = 100^\circ C$	8.5	A
$I_{DM}^{(1)}$	Drain current (pulsed)	48	A
P_{TOT}	Total dissipation at $T_C = 25^\circ C$	30	W
	Derating factor	0.2	W/ $^\circ C$
dv/dt ⁽²⁾	Peak diode recovery voltage slope	15	V/ns
$E_{AS}^{(3)}$	Single pulse avalanche energy	100	mJ
T_{stg}	Storage temperature	$-55 \text{ to } 175$	$^\circ C$
T_J	Max. operating junction temperature		

1. Pulse width limited by safe operating area
2. $I_{SD} \leq 12A$, $di/dt \leq 200A/\mu s$, $V_{DS} \leq 40V$, $T_J \leq T_{JMAX}$
3. Starting $T_J = 25^\circ C$, $I_D = 6A$, $V_{DD} = 30V$

Table 2. Thermal data

Symbol	Parameter	Value	Unit
R_{thJC}	Thermal resistance junction-case Max	5	$^\circ C/W$
R_{thJA}	Thermal resistance junction-ambient Max	100	$^\circ C/W$
T_I	Maximum lead temperature for soldering purpose	275	$^\circ C$

2 Electrical characteristics

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

Table 3. On/off states

Symbol	Parameter	Test conditions	Min.	Typ.	Max.	Unit
$V_{(BR)DSS}$	Drain-source breakdown voltage	$I_D = 25\text{mA}, V_{GS} = 0$	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 ($V_{DS} = 0$)	$V_{GS} = \pm 20\text{V}$			± 100	nA
$V_{GS(\text{th})}$	Gate threshold voltage	$V_{DS} = V_{GS}, I_D = 250\mu\text{A}$	1		2	V
$R_{DS(\text{on})}$	Static drain-source on resistance	$V_{GS} = 10\text{V}, I_D = 6\text{A}$ $V_{GS} = 5\text{V}, I_D = 6\text{A}$		0.08 0.10	0.10 0.12	Ω Ω

Table 4. Dynamic

Symbol	Parameter	Test conditions	Min.	Typ.	Max.	Unit
$g_{fs}^{(1)}$	Forward transconductance	$V_{DS} = 25\text{V}, I_D = 6\text{A}$		7		S
C_{iss} C_{oss} C_{rss}	Input capacitance Output capacitance Reverse transfer capacitance	$V_{DS} = 25\text{V}, f = 1 \text{ MHz}, V_{GS} = 0$		350 75 30		pF pF pF
Q_g Q_{gs} Q_{gd}	Total gate charge Gate-source charge Gate-drain charge	$V_{DD} = 48\text{V}, I_D = 12\text{A}$ $V_{GS} = 5\text{V}$		7.5 2.5 3.0	10	nC nC nC

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

Table 5. Switching times

Symbol	Parameter	Test conditions	Min.	Typ.	Max.	Unit
$t_{d(\text{on})}$ t_r $t_{d(\text{off})}$ t_f	Turn-on delay time Rise time Turn-off delay time Fall time	$V_{DD} = 30\text{V}, I_D = 6\text{A}, R_G = 4.7\Omega, V_{GS} = 4.5\text{V}$		10 35 20 13		ns ns ns ns

Table 6. Source drain diode

Symbol	Parameter	Test conditions	Min	Typ.	Max	Unit
I_{SD}	Source-drain current				12	A
I_{SDM}	Source-drain current (pulsed)				48	A
$V_{SD}^{(1)}$	Forward on voltage	$I_{SD} = 12A, V_{GS} = 0$			1.5	V
t_{rr} Q_{rr} I_{RRM}	Reverse recovery time Reverse recovery charge Reverse recovery current	$I_{SD} = 12A,$ $di/dt = 100A/\mu s,$ $V_{DD} = 16V, T_J = 150^{\circ}C$		50 65 2.5		ns μC A

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

2.1 Electrical characteristics (curves)

Figure 1. Safe operating area

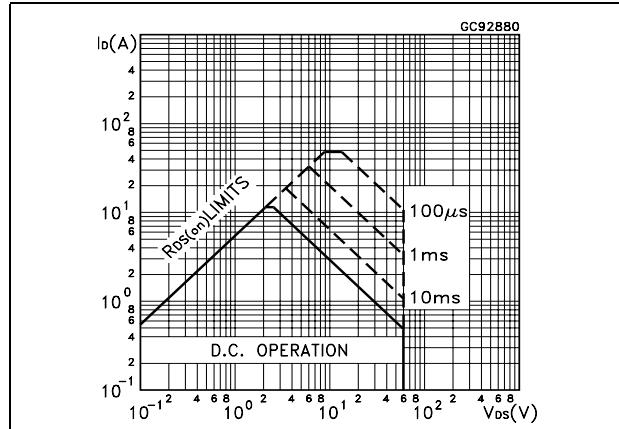


Figure 2. Thermal impedance

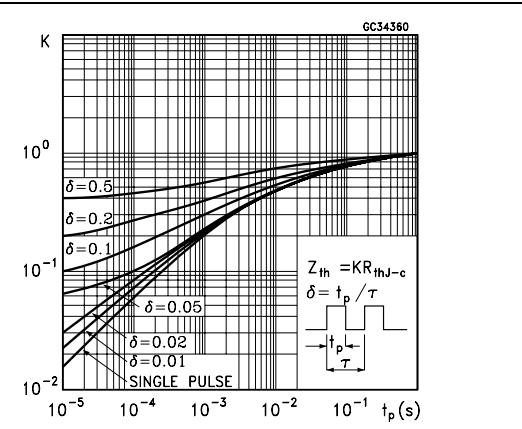


Figure 3. Output characteristics

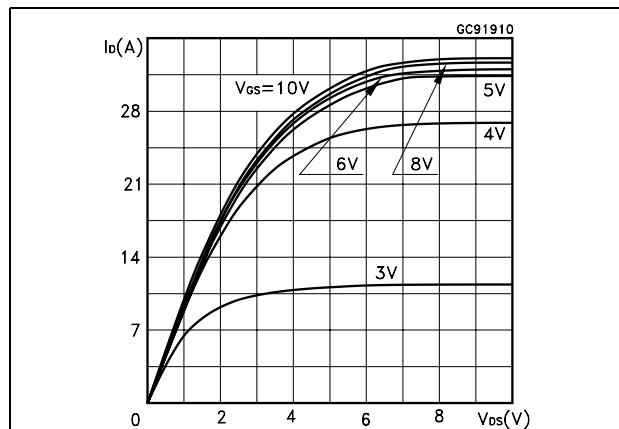


Figure 4. Transfer characteristics

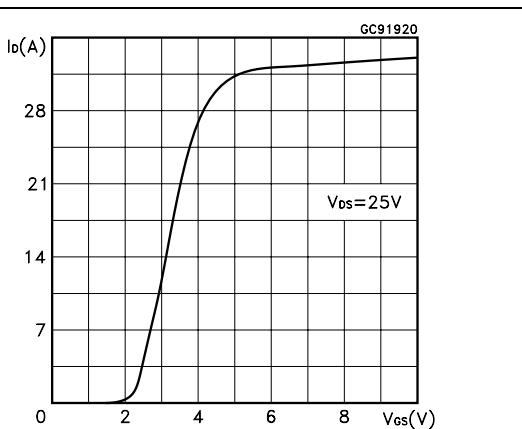


Figure 5. Transconductance

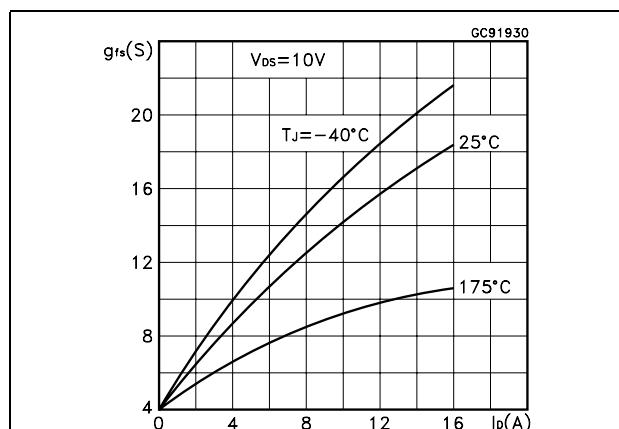


Figure 6. Static drain-source on resistance

