STD10NF10
STD10NF10-1

N-channel 100V - 0.115Ω - 13A - DPAK - IPAK
Low gate charge STripFET™ II Power MOSFET

General features

Type	V_{DSSS}	$R_{DS(on)}$	I_D
STD10NF10	100V	<0.13Ω	13A
STD10NF10-1	100V	<0.13Ω	13A

- Exceptional dv/dt capability
- Application oriented characterization

DPAK IPAK

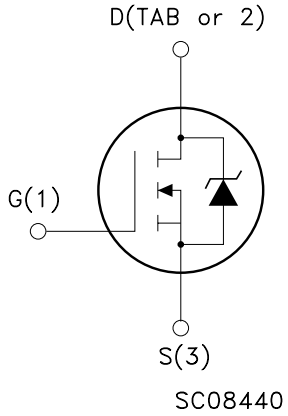
Description

This MOSFET series realized with STMicroelectronics unique STripFET process has specifically been designed to minimize input capacitance and gate charge. It is therefore suitable as primary switch in advanced high-efficiency, high-frequency isolated DC-DC converters for Telecom and Computer applications. It is also intended for any applications with low gate drive requirements.

Applications

- Switching application

Internal schematic diagram



Order codes

Part number	Marking	Package	Packaging
STD10NF10T4	D10NF10	DPAK	Tape & reel
STD10NF10-1	D10NF10	IPAK	Tube

1 Electrical ratings

Table 1. Absolute maximum ratings

Symbol	Parameter	Value	Unit
V_{DS}	Drain-source voltage (V_{GS} = 0)	100	V
V_{DGR}	Drain-gate voltage (R_{GS} = 20KΩ)	100	V
V_{GS}	Gate-source voltage	± 20	V
I_D	Drain current (continuous) at T_C = 25°C	13	A
I_D	Drain current (continuous) at T_C=100°C	9	A
I_{DM} (1)	Drain current (pulsed)	52	A
P_{TOT}	Total dissipation at T_C = 25°C	50	W
	Derating factor	0.33	W/°C
E_{AS} (2)	Single pulse avalanche energy	70	mJ
dv/dt (3)	Peak diode recovery voltage slope	9	V/ns
T_{stg}	Storage temperature	-55 to 175	°C
T_J	Max. operating junction temperature		

1. Pulse width limited by safe operating area
2. Starting T_J = 25 °C, I_D = 15A, V_{DD} = 50V
3. $I_{SD} \leq$13A, di/dt $\leq$300 A/µs, $V_{DS} \leq V_{(BR)DSS}$, $T_J \leq T_{JMAX}$

Table 2. Thermal data

Symbol	Parameter	Value	Unit
R_{thJC}	Thermal resistance junction-case Max	3.0	°C/W
R_{thJA}	Thermal resistance junction-ambient Max	100	°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	100			V
I_{DSS}	Zero gate voltage drain current (V_{GS} = 0)	V_{DS} = Max rating V_{DS} = Max rating, T_C = 125°C			1 10	µA µA
I_{GSS}	Gate body leakage current (V_{DS} = 0)	V_{GS} = ±20V			±100	nA
$V_{GS(th)}$	Gate threshold voltage	V_{DS}= V_{GS}, I_D = 250µA	2	3	4	V
$R_{DS(on)}$	Static drain-source on resistance	V_{GS} = 10V, I_D = 5A		0.115	0.13	Ω

Table 4. Dynamic

Symbol	Parameter	Test conditions	Min.	Typ.	Max.	Unit
g_{fs} (1)	Forward transconductance	V_{DS} = 15V, I_D = 5A		20		S
C_{iss} C_{oss} C_{rss}	Input capacitance Output capacitance Reverse transfer capacitance	V_{DS} = 25V, f = 1 MHz, V_{GS} = 0		460 70 30		pF pF pF
Q_g Q_{gs} Q_{gd}	Total gate charge Gate-source charge Gate-drain charge	V_{DD} = 80V, I_D = 10A V_{GS} = 10V		15.3 3.7 4.7	21	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 $t_{d(off)}$ t_f	Turn-on delay time Rise time Turn-off delay time Fall time	V_{DD} = 27V, I_D = 5A, R_G = 4.7Ω, V_{GS} = 10V		16 25 32 8		ns ns ns ns

Table 6. Source drain diode

Symbol	Parameter	Test conditions	Min	Typ.	Max	Unit
I_{SD}	Source-drain current				13	A
I_{SDM} (1)	Source-drain current (pulsed)				52	A
V_{SD}(2)	Forward on voltage	I_{SD} = 10A, V_{GS} = 0			1.5	V
t_{rr} Q_{rr} I_{RRM}	Reverse recovery time Reverse recovery charge Reverse recovery current	I_{SD} = 10A, di/dt = 100A/µs, V_{DD} = 50V, T_J = 150°C		90 230 5		ns µC 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

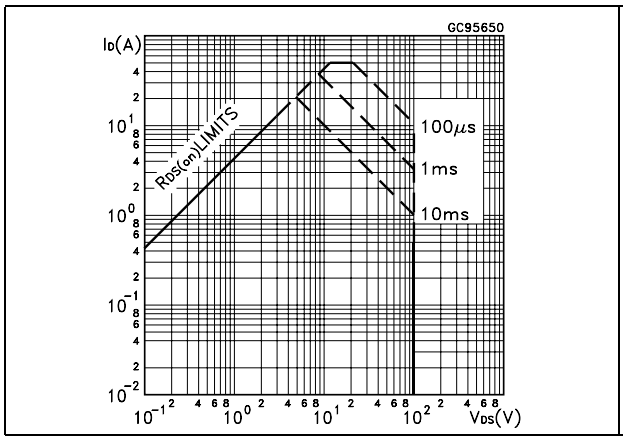


Figure 2. Thermal impedance

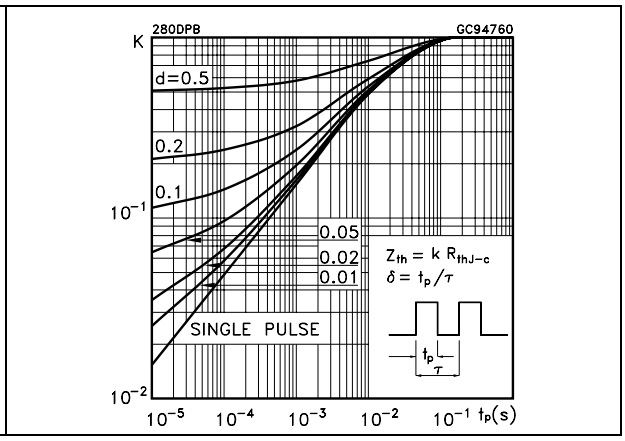


Figure 3. Output characterisics

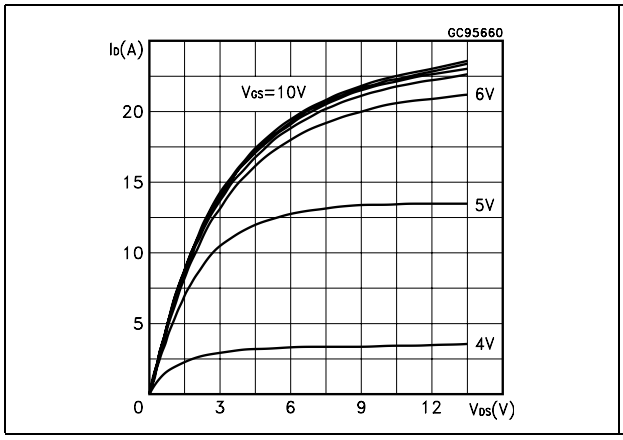


Figure 4. Transfer characteristics

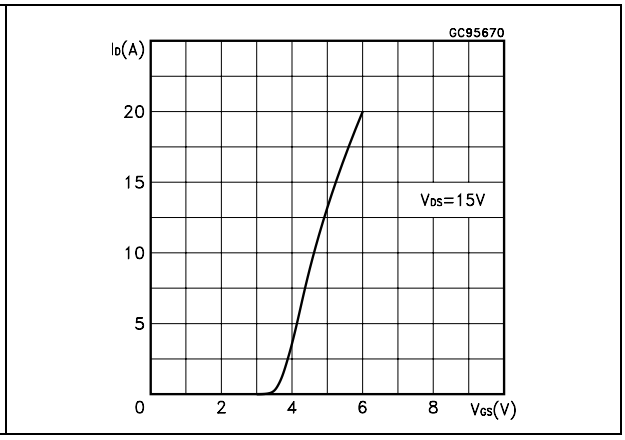


Figure 5. Transconductance

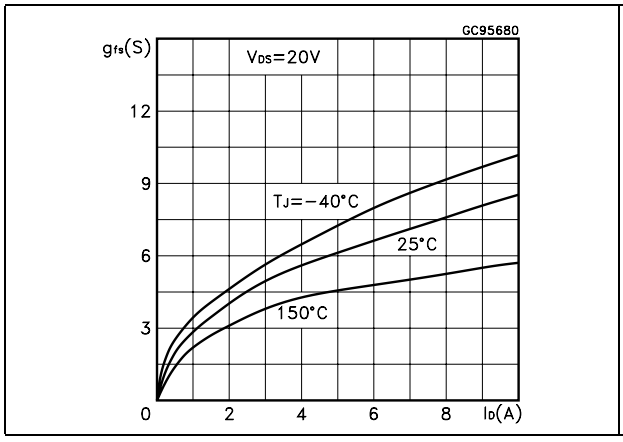


Figure 6. Static drain-source on resistance