FCPF260N65FL1

N-Channel SuperFET® II FRFET® MOSFET

650 V, 15 A, 260 mΩ

Features

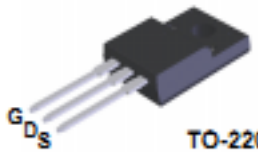
- 700 V @T_J = 150°C
- $R_{DS(on)}$ = 220 mΩ (Typ.)
- Ultra Low Gate Charge (Typ. Q_g = 46 nC)
- Low Effective Output Capacitance (Typ. $C_{oss(eff.)}$ = 223 pF)
- 100% Avalanche Tested
- RoHS Compliant

Applications

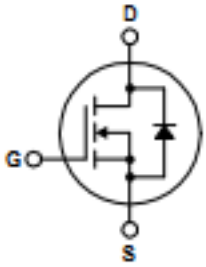
- LCD / LED / PDP TV
- Telecom / Server Power Supplies
- Solar Inverter
- AC - DC Power Supply

Description

SuperFET® II MOSFET is Fairchild Semiconductor's brand-new high voltage super-junction (SJ) MOSFET family that is utilizing charge balance technology for outstanding low on-resistance and lower gate charge performance. This technology is tailored to minimize conduction loss, provide superior switching performance, dv/dt rate and higher avalanche energy. Consequently, SuperFET II MOSFET is very suitable for the switching power applications such as PFC, server/telecom power, FPD TV power, ATX power and industrial power applications. SuperFET II FRFET® MOSFET's optimized body diode reverse recovery performance can remove additional component and improve system reliability.



TO-220F



Absolute Maximum Ratings T_C = 25°C unless otherwise noted.

Symbol	Parameter		FCPF260N65FL1	Unit
V_{DSS}	Drain to Source Voltage		650	V
V_{GSS}	Gate to Source Voltage	- DC	±20	V
		- AC (f > 1 Hz)	±30	
I_D	Drain Current	- Continuous (T_C = 25°C)	15	A
		- Continuous (T_C = 100°C)	9.5	
I_{DM}	Drain Current	- Pulsed (Note 1)	45	A
E_{AS}	Single Pulsed Avalanche Energy	(Note 2)	293	mJ
I_{AR}	Avalanche Current	(Note 1)	3	A
E_{AR}	Repetitive Avalanche Energy	(Note 1)	0.36	mJ
dv/dt	MOSFET dv/dt		100	V/ns
	Peak Diode Recovery dv/dt	(Note 3)	50	
P_D	Power Dissipation	(T_C = 25°C)	36	W
		- Derate Above 25°C	0.29	W/°C
T_J, T_{STG}	Operating and Storage Temperature Range		-55 to +150	°C
T_L	Maximum Lead Temperature for Soldering, 1/8" from Case for 5 Seconds		300	°C

Thermal Characteristics

Symbol	Parameter	FCPF260N65FL1	Unit
$R_{\theta JC}$	Thermal Resistance, Junction to Case, Max.	3.5	°C/W
$R_{\theta JA}$	Thermal Resistance, Junction to Ambient, Max.	62.5	

Package Marking and Ordering Information

Part Number	Top Mark	Package	Packing Method	Reel Size	Tape Width	Quantity
FCPF260N65FL1	FCPF260N65F	TO-220F	Tube	N/A	N/A	50 units

Electrical Characteristics T_C = 25°C unless otherwise noted.

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
Off Characteristics						
BV_{DSS}	Drain to Source Breakdown Voltage	V_{GS} = 0 V, I_D = 10 mA, T_J = 25°C	650	-	-	V
		V_{GS} = 0 V, I_D = 10 mA, T_J = 150°C	700	-	-	V
ΔBV_{DSS} / ΔT_J	Breakdown Voltage Temperature Coefficient	I_D = 10 mA, Referenced to 25°C	-	0.72	-	V/°C
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS} = 650 V, V_{GS} = 0 V	-	-	10	μA
		V_{DS} = 520 V, V_{GS} = 0 V, T_C = 125°C	-	40	-	
I_{GSS}	Gate to Body Leakage Current	V_{GS} = ±20 V, V_{DS} = 0 V	-	-	±100	μA
On Characteristics						
$V_{GS(th)}$	Gate Threshold Voltage	V_{GS} = V_{DS}, I_D = 1.5 mA	3	-	5	V
$R_{DS(on)}$	Static Drain to Source On Resistance	V_{GS} = 10 V, I_D = 7.5 A	-	220	260	mΩ
g_{FS}	Forward Transconductance	V_{DS} = 20 V, I_D = 7.5 A	-	14.2	-	S
Dynamic Characteristics						
C_{iss}	Input Capacitance	V_{DS} = 100 V, V_{GS} = 0 V, f = 1 MHz	-	1760	2340	pF
C_{oss}	Output Capacitance		-	59	80	pF
C_{rss}	Reverse Transfer Capacitance		-	1.0	-	pF
C_{oss}	Output Capacitance	V_{DS} = 380 V, V_{GS} = 0 V, f = 1 MHz	-	34	-	pF
$C_{oss(eff.)}$	Effective Output Capacitance	V_{DS} = 0 V to 400 V, V_{GS} = 0 V	-	223	-	pF
$Q_{g(tot)}$	Total Gate Charge at 10V	V_{DS} = 380 V, I_D = 7.5 A, V_{GS} = 10 V (Note 4)	-	46	60	nC
Q_{gs}	Gate to Source Gate Charge		-	9.8	-	nC
Q_{gd}	Gate to Drain "Miller" Charge		-	20	-	nC
ESR	Equivalent Series Resistance	f = 1 MHz	-	0.52	-	Ω
Switching Characteristics						
$t_{d(on)}$	Turn-On Delay Time	V_{DD} = 380 V, I_D = 7.5 A, V_{GS} = 10 V, R_g = 4.7 Ω (Note 4)	-	21.7	54	ns
t_r	Turn-On Rise Time		-	10.5	32	ns
$t_{d(off)}$	Turn-Off Delay Time		-	54	118	ns
t_f	Turn-Off Fall Time		-	5.8	22	ns
Drain-Source Diode Characteristics						
I_S	Maximum Continuous Drain to Source Diode Forward Current		-	-	15	A
I_{SM}	Maximum Pulsed Drain to Source Diode Forward Current		-	-	45	A
V_{SD}	Drain to Source Diode Forward Voltage	V_{GS} = 0 V, I_{SD} = 7.5 A	-	-	1.2	V
t_{rr}	Reverse Recovery Time	V_{GS} = 0 V, I_{SD} = 7.5 A, dI_F/dt = 100 A/μs	-	98	-	ns
Q_{rr}	Reverse Recovery Charge		-	450	-	nC

Notes:

1. Repetitive rating: pulse width limited by maximum junction temperature.
2. I_{AS} = 3 A, R_G = 25 Ω, Starting T_J = 25°C
3. I_{SD} ≤ 7.5 A, di/dt ≤ 200 A/μs, V_{DD} ≤ 380 V, Starting T_J = 25°C
4. Essentially independent of operating temperature.