FDD13AN06A0

N-Channel PowerTrench® MOSFET
60 V, 50 A, 13 mΩ

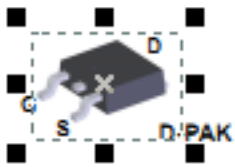
Features

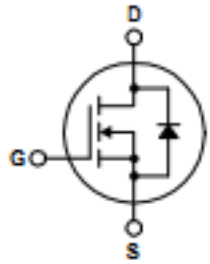
- $R_{DS(on)}$ = 11.5 mΩ (Typ.) @ V_{GS} = 10 V, I_D = 50 A
- $Q_{g(tot)}$ = 22 nC (Typ.) @ V_{GS} = 10 V
- Low Miller Charge
- Low Q_{rr} Body Diode
- UIS Capability (Single Pulse and Repetitive Pulse)

Applications

- Consumer Appliances
- LED TV
- Synchronous Rectification
- Battery Protection Circuit
- Motor Drives and Uninterruptible Power Supplies

Formerly developmental type 82555





MOSFET Maximum Ratings T_C = 25°C unless otherwise noted

Symbol	Parameter	FDD13AN06A0	Unit
V_{DSS}	Drain to Source Voltage	60	V
V_{GS}	Gate to Source Voltage	±20	V
I_D	Drain Current Continuous (T_C < 80°C, V_{GS} = 10V)	50	A
	Continuous (T_A = 25°C, V_{GS} = 10V, $R_{\theta JA}$ = 52°C/W)	9.9	A
	Pulsed	Figure 4	A
E_{AS}	Single Pulse Avalanche Energy (Note 1)	56	mJ
P_D	Power dissipation	115	W
	Derate above 25°C	0.77	W/°C
T_J, T_{STG}	Operating and Storage Temperature	-55 to 175	°C

Thermal Characteristics

$R_{\theta JC}$	Thermal Resistance Junction to Case, Max. D-PAK	1.3	°C/W
R_{θ}	Thermal Resistance Junction to Ambient, Max. D-PAK	100	°C/W
$R_{\theta JA}$	Thermal Resistance Junction to Ambient, Max. D-PAK, 1in² copper pad area	52	°C/W

Package Marking and Ordering Information

Device Marking	Device	Package	Reel Size	Tape Width	Quantity
FDD13AN06A0	FDD13AN06A0	D-PAK	330 mm	16 mm	2500 units

Electrical Characteristics T_C = 25°C unless otherwise noted

Symbol	Parameter	Test Conditions	Min	Typ	Max	Unit
Off Characteristics						
B_{VDSS}	Drain to Source Breakdown Voltage	I_D = 250μA, V_{GS} = 0V	60	•	•	V
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS} = 50V, V_{GS} = 0V	•	•	1	μA
		V_{DS} = 50V, V_{GS} = 0V, T_C = 150°C	•	•	250	
I_{GSS}	Gate to Source Leakage Current	V_{GS} = ±20V	•	•	±100	nA
On Characteristics						
$V_{GS(TH)}$	Gate to Source Threshold Voltage	V_{GS} = V_{DS}, I_D = 250μA	2	•	4	V
$r_{DS(ON)}$	Drain to Source On Resistance	I_D = 50A, V_{GS} = 10V	•	0.0115	0.0135	Ω
		I_D = 25A, V_{GS} = 6V	•	0.022	0.034	
		I_D = 50A, V_{GS} = 10V, T_J = 175°C	•	0.026	0.030	
Dynamic Characteristics						
C_{ISS}	Input Capacitance	V_{DS} = 25V, V_{GS} = 0V, f = 1MHz	•	1350	•	pF
C_{OSS}	Output Capacitance		•	260	•	pF
C_{RSS}	Reverse Transfer Capacitance		•	90	•	pF
$Q_{g(TOT)}$	Total Gate Charge at 10V	V_{GS} = 0V to 10V; V_{DD} = 30V, I_D = 50A, I_g = 1.0mA		22	29	nC
$Q_{g(TH)}$	Threshold Gate Charge	V_{GS} = 0V to 2V	•	2.6	3.4	nC
Q_{gs}	Gate to Source Gate Charge		•	8.2	•	nC
Q_{gs2}	Gate Charge Threshold to Plateau		•	5.6	•	nC
Q_{gd}	Gate to Drain "Miller" Charge		•	6.4	•	nC
Switching Characteristics (V_{GS} = 10V)						
t_{ON}	Turn-On Time	V_{DD} = 30V, I_D = 50A, V_{GS} = 10V, R_{GS} = 12Ω	•	•	130	ns
$t_{d(ON)}$	Turn-On Delay Time		•	9	•	ns
t_r	Rise Time		•	77	•	ns
$t_{d(OFF)}$	Turn-Off Delay Time		•	26	•	ns
t_f	Fall Time		•	25	•	ns
t_{OFF}	Turn-Off Time		•	•	77	ns
Drain-Source Diode Characteristics						
V_{SD}	Source to Drain Diode Voltage	I_{SD} = 50A	•	•	1.25	V
		I_{SD} = 25A	•	•	1.0	V
t_{rr}	Reverse Recovery Time	I_{SD} = 50A, dI_{SD}/dt = 100A/μs	•	•	24	ns
Q_{RR}	Reverse Recovered Charge	I_{SD} = 50A, dI_{SD}/dt = 100A/μs	•	•	15	nC

Notes:
1: Starting T_J = 25°C, L = 45μH, I_{AS} = 50A.