FDB060AN08A0 / FDP060AN08A0

N-Channel PowerTrench® MOSFET
75V, 80A, 6.0mΩ

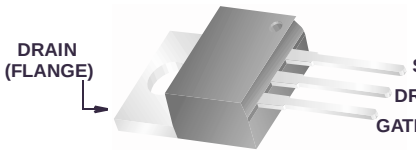
Features

- $r_{DS(ON)}$ = 4.8mΩ (Typ.), V_{GS} = 10V, I_D = 80A
- Q_g(tot) = 73nC (Typ.), V_{GS} = 10V
- Low Miller Charge
- Low Q_{RR} Body Diode
- UIS Capability (Single Pulse and Repetitive Pulse)
- Qualified to AEC Q101

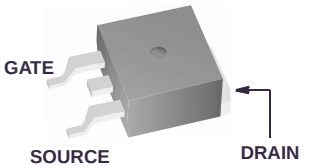
Formerly developmental type 82680

Applications

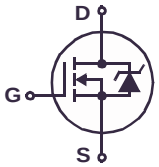
- 42V Automotive Load Control
- Starter / Alternator Systems
- Electronic Power Steering Systems
- Electronic Valve Train Systems
- DC-DC converters and Off-line UPS
- Distributed Power Architectures and VRMs
- Primary Switch for 24V and 48V systems



TO-220AB
FDP SERIES



TO-263AB
FDB SERIES



MOSFET Maximum Ratings T_C = 25°C unless otherwise noted

Symbol	Parameter	Ratings	Units
V_{DSS}	Drain to Source Voltage	75	V
V_{GS}	Gate to Source Voltage	±20	V
I_D	Drain Current Continuous (T_C < 127°C, V_{GS} = 10V)	80	A
	Continuous (T_{amb} = 25°C, V_{GS} = 10V, with $R_{\theta JA}$ = 43°C/W)	16	A
	Pulsed	Figure 4	A
E_{AS}	Single Pulse Avalanche Energy (Note 1)	350	mJ
P_D	Power dissipation	255	W
	Derate above 25°C	1.7	W/°C
T_J, T_{STG}	Operating and Storage Temperature	-55 to 175	°C

Thermal Characteristics

$R_{\theta JC}$	Thermal Resistance Junction to Case TO-220,TO-263	0.58	°C/W
$R_{\theta JA}$	Thermal Resistance Junction to Ambient TO-220,TO-263 (Note 2)	62	°C/W
$R_{\theta JA}$	Thermal Resistance Junction to Ambient TO-263, 1in^2 copper pad area	43	°C/W

This product has been designed to meet the extreme test conditions and environment demanded by the automotive industry. For a copy of the requirements, see AEC Q101 at: http://www.aecouncil.com/
Reliability data can be found at: http://www.fairchildsemi.com/products/discrete/reliability/index.html.
All Fairchild Semiconductor products are manufactured, assembled and tested under ISO9000 and QS9000 quality systems certification.

Package Marking and Ordering Information

Device Marking	Device	Package	Reel Size	Tape Width	Quantity
FDB060AN08A0	FDB060AN08A0	TO-263AB	330mm	24mm	800 units
FDP060AN08A0	FDP060AN08A0	TO-220AB	Tube	N/A	50 units

Electrical Characteristics T_C = 25°C unless otherwise noted

Symbol	Parameter	Test Conditions	Min	Typ	Max	Units
Off Characteristics						
B_{VDSS}	Drain to Source Breakdown Voltage	I_D = 250µA, V_{GS} = 0V	75	-	-	V
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS} = 60V, V_{GS} = 0V	-	-	1	µA
		V_{DS} = 60V, 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 = 80A, V_{GS} = 10V	-	0.0048	0.006	Ω
		I_D = 40A, V_{GS} = 6V	-	0.0066	0.010	
		I_D = 80A, V_{GS} = 10V, T_J = 175°C	-	0.010	0.013	
Dynamic Characteristics						
C_{ISS}	Input Capacitance	V_{DS} = 25V, V_{GS} = 0V, f = 1MHz	-	5150	-	pF
C_{OSS}	Output Capacitance		-	800	-	pF
C_{RSS}	Reverse Transfer Capacitance		-	230	-	pF
$Q_{g(TOT)}$	Total Gate Charge at 10V	V_{GS} = 0V to 10V, V_{DD} = 40V, I_D = 80A, I_g = 1.0mA		73	95	nC
$Q_{g(TH)}$	Threshold Gate Charge	V_{GS} = 0V to 2V, V_{DD} = 40V, I_D = 80A, I_g = 1.0mA	-	10	13	nC
Q_{gs}	Gate to Source Gate Charge	V_{DD} = 40V, I_D = 80A, I_g = 1.0mA	-	29	-	nC
Q_{gs2}	Gate Charge Threshold to Plateau	V_{DD} = 40V, I_D = 80A, I_g = 1.0mA	-	19	-	nC
Q_{gd}	Gate to Drain “Miller” Charge	V_{DD} = 40V, I_D = 80A, I_g = 1.0mA	-	16	-	nC
Switching Characteristics (V_{GS} = 10V)						
t_{ON}	Turn-On Time	V_{DD} = 40V, I_D = 80A, V_{GS} = 10V, R_{GS} = 3.9Ω	-	-	147	ns
$t_{d(ON)}$	Turn-On Delay Time		-	19	-	ns
t_r	Rise Time		-	79	-	ns
$t_{d(OFF)}$	Turn-Off Delay Time		-	37	-	ns
t_f	Fall Time		-	38	-	ns
t_{OFF}	Turn-Off Time		-	-	113	ns
Drain-Source Diode Characteristics						
V_{SD}	Source to Drain Diode Voltage	I_{SD} = 80A	-	-	1.25	V
		I_{SD} = 40A	-	-	1.0	V
t_{rr}	Reverse Recovery Time	I_{SD} = 75A, dI_{SD}/dt = 100A/µs	-	-	37	ns
Q_{RR}	Reverse Recovered Charge	I_{SD} = 75A, dI_{SD}/dt = 100A/µs	-	-	38	nC

Notes:
1: Starting T_J = 25°C, L = 109µH, I_{AS} = 80A.
2: Pulse width = 100s

Typical Characteristics T_C = 25°C unless otherwise noted

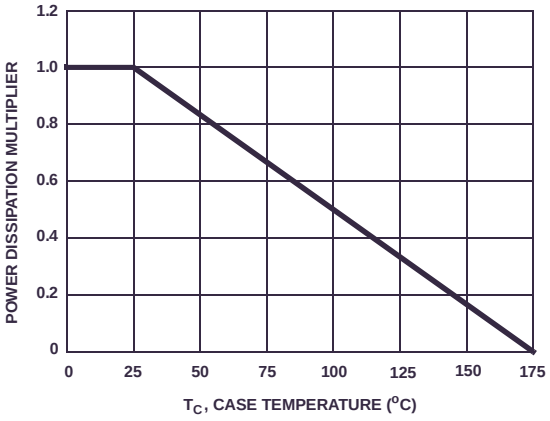


Figure 1. Normalized Power Dissipation vs Ambient Temperature

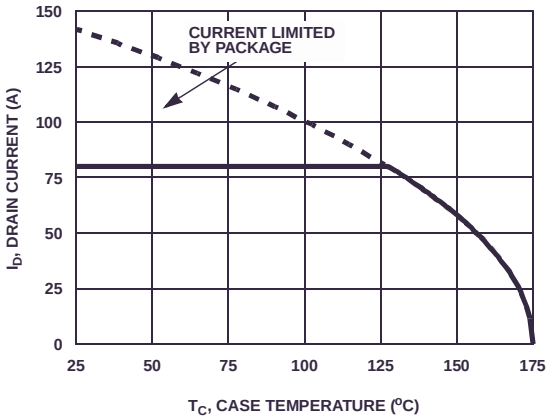


Figure 2. Maximum Continuous Drain Current vs Case Temperature

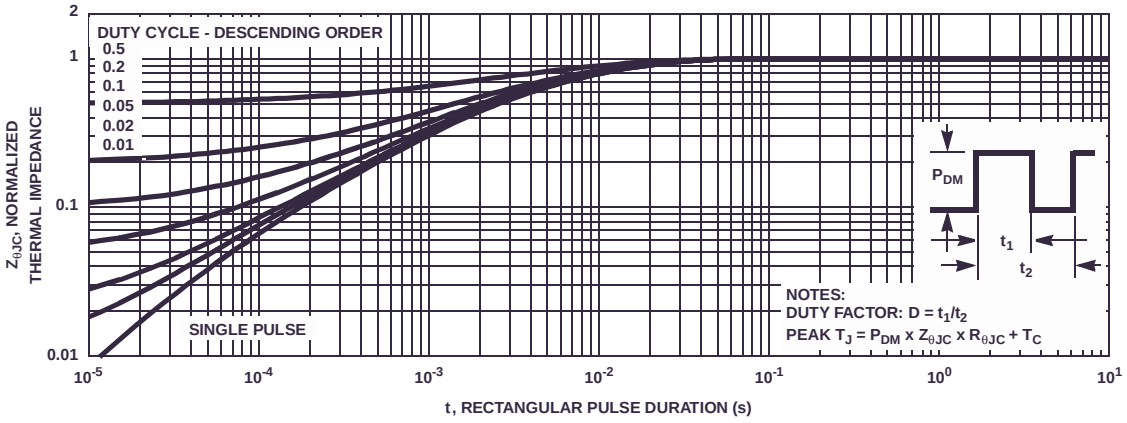


Figure 3. Normalized Maximum Transient Thermal Impedance

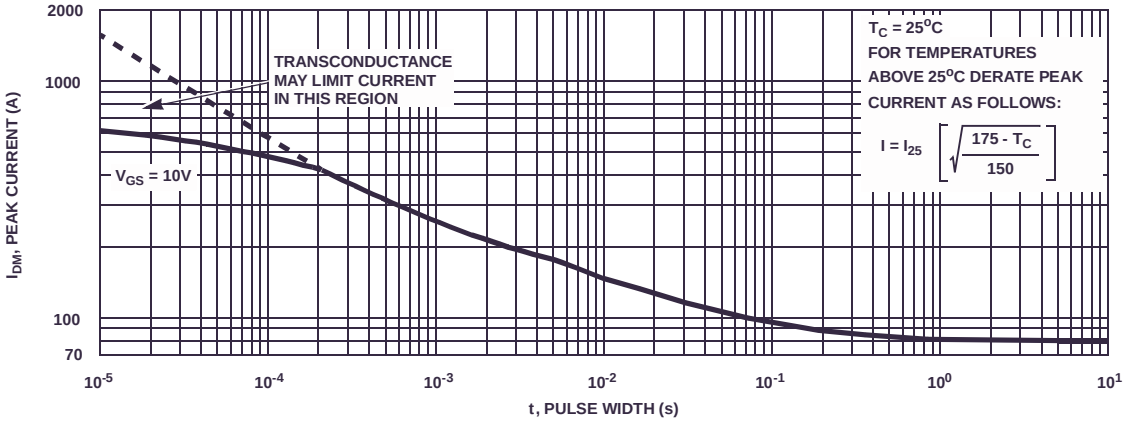


Figure 4. Peak Current Capability