

FDP16AN08A0 / FDB16AN08A0

N-Channel PowerTrench® MOSFET
75V, 58A, 16mΩ

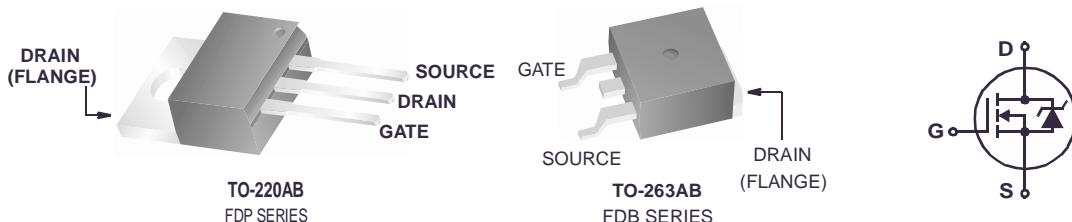
Features

- $r_{DS(ON)} = 13\text{m}\Omega$ (Typ.), $V_{GS} = 10\text{V}$, $I_D = 58\text{A}$
- $Q_g(\text{tot}) = 28\text{nC}$ (Typ.), $V_{GS} = 10\text{V}$
- Low Miller Charge
- Low Qrr Body Diode
- UIS Capability (Single Pulse and Repetitive Pulse)
- Qualified to AEC Q101

Formerly developmental type 82660

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



MOSFET Maximum Ratings $T_C = 25^\circ\text{C}$ 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 ($T_C = 25^\circ\text{C}$, $V_{GS} = 10\text{V}$)	58	A
	Continuous ($T_C = 100^\circ\text{C}$, $V_{GS} = 10\text{V}$)	44	
	Continuous ($T_{amb} = 25^\circ\text{C}$, $V_{GS} = 10\text{V}$, with $R_{θJA} = 43^\circ\text{C}/\text{W}$)	9	A
	Pulsed	Figure 4	A
E_{AS}	Single Pulse Avalanche Energy (Note 1)	117	mJ
P_D	Power dissipation	135	W
	Derate above 25°C	0.9	$\text{W}/^\circ\text{C}$
T_J , T_{STG}	Operating and Storage Temperature	-55 to 175	$^\circ\text{C}$

Thermal Characteristics

$R_{θJC}$	Thermal Resistance Junction to Case TO-220,TO-263	1.11	$^\circ\text{C}/\text{W}$
$R_{θJA}$	Thermal Resistance Junction to Ambient TO-220,TO-263	62	$^\circ\text{C}/\text{W}$
$R_{θJA}$	Thermal Resistance Junction to Ambient TO-263, 1in ² copper pad area	43	$^\circ\text{C}/\text{W}$

Package Marking and Ordering Information

Device Marking	Device	Package	Reel Size	Tape Width	Quantity
FDB16AN08A0	FDB16AN08A0	TO-263AB	330mm	24mm	800 units
FDP16AN08A0	FDP16AN08A0	TO-220AB	Tube	N/A	50 units

Electrical Characteristics $T_C = 25^\circ\text{C}$ unless otherwise noted

Symbol	Parameter	Test Conditions	Min	Typ	Max	Units
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Off Characteristics

B_{VDSS}	Drain to Source Breakdown Voltage	$I_D = 250\mu\text{A}, V_{GS} = 0\text{V}$	75	-	-	V
I_{DSS}	Zero Gate Voltage Drain Current	$V_{DS} = 60\text{V}$	-	-	1	μA
		$V_{GS} = 0\text{V}$	$T_C = 150^\circ\text{C}$	-	-	
I_{GSS}	Gate to Source Leakage Current	$V_{GS} = \pm 20\text{V}$	-	-	± 100	nA

On Characteristics

$V_{GS(TH)}$	Gate to Source Threshold Voltage	$V_{GS} = V_{DS}, I_D = 250\mu\text{A}$	2	-	4	V
$r_{DS(ON)}$	Drain to Source On Resistance	$I_D = 58\text{A}, V_{GS} = 10\text{V}$	-	0.013	0.016	Ω
		$I_D = 29\text{A}, V_{GS} = 6\text{V}$	-	0.019	0.029	
		$I_D = 58\text{A}, V_{GS} = 10\text{V}, T_J = 175^\circ\text{C}$	-	0.032	0.037	

Dynamic Characteristics

C_{ISS}	Input Capacitance	$V_{DS} = 25\text{V}, V_{GS} = 0\text{V}, f = 1\text{MHz}$	-	1857	-	pF
C_{OSS}	Output Capacitance		-	288	-	pF
C_{RSS}	Reverse Transfer Capacitance		-	88	-	pF
$Q_{g(TOT)}$	Total Gate Charge at 10V	$V_{GS} = 0\text{V to } 10\text{V}$	-	28	42	nC
$Q_{g(TH)}$	Threshold Gate Charge		-	3.5	5	nC
Q_{gs}	Gate to Source Gate Charge		-	11	-	nC
Q_{gs2}	Gate Charge Threshold to Plateau		-	7.6	-	nC
Q_{gd}	Gate to Drain "Miller" Charge		-	6.4	-	nC

Switching Characteristics ($V_{GS} = 10\text{V}$)

t_{ON}	Turn-On Time	$V_{DD} = 40\text{V}, I_D = 58\text{A}$	-	-	135	ns
$t_{d(ON)}$	Turn-On Delay Time		-	8	-	ns
t_r	Rise Time		-	82	-	ns
$t_{d(OFF)}$	Turn-Off Delay Time		-	28	-	ns
t_f	Fall Time		-	30	-	ns
t_{OFF}	Turn-Off Time		-	-	86	ns

Drain-Source Diode Characteristics

V_{SD}	Source to Drain Diode Voltage	$I_{SD} = 58\text{A}$	-	-	1.25	V
		$I_{SD} = 29\text{A}$	-	-	1.0	V
t_{rr}	Reverse Recovery Time	$I_{SD} = 58\text{A}, dI_{SD}/dt = 100\text{A}/\mu\text{s}$	-	-	35	ns
Q_{RR}	Reverse Recovered Charge	$I_{SD} = 58\text{A}, dI_{SD}/dt = 100\text{A}/\mu\text{s}$	-	-	36	nC

Notes:

1: Starting $T_J = 25^\circ\text{C}$, $L = 260\mu\text{H}$, $I_{AS} = 30\text{A}$.

Typical Characteristics $T_C = 25^\circ\text{C}$ unless otherwise noted

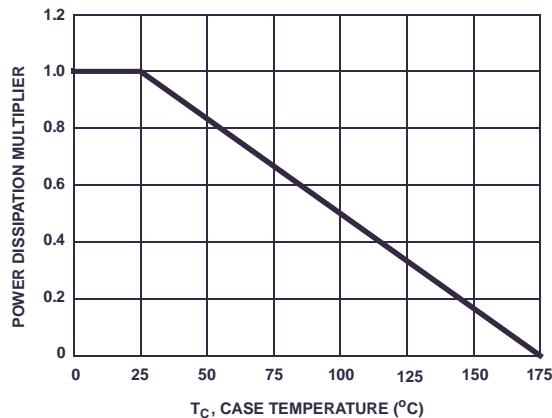


Figure 1. Normalized Power Dissipation vs Ambient Temperature

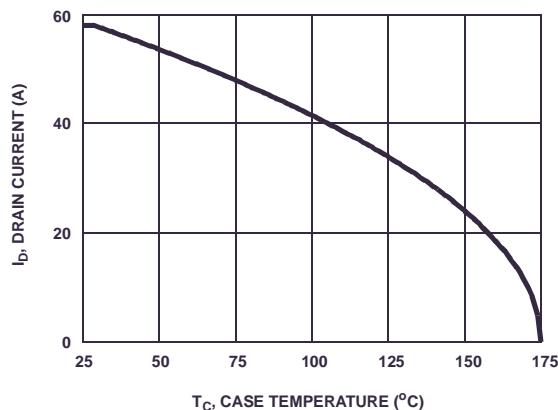


Figure 2. Maximum Continuous Drain Current vs Case Temperature

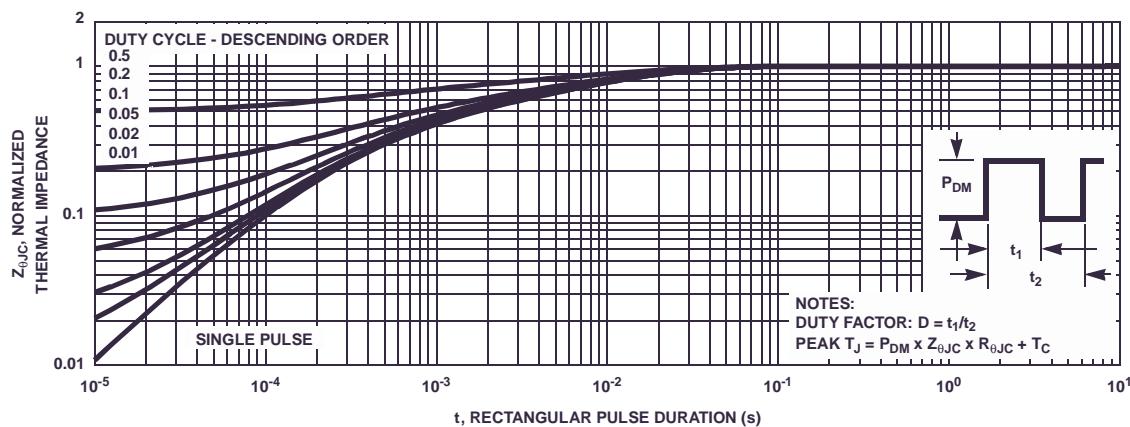


Figure 3. Normalized Maximum Transient Thermal Impedance

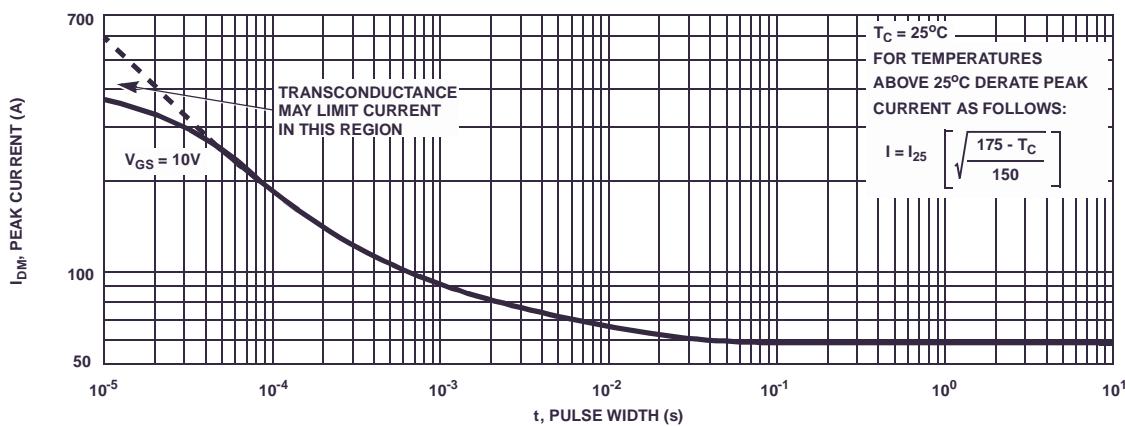


Figure 4. Peak Current Capability