

FDB3632 / FDP3632 / FDI3632

N-Channel PowerTrench[®] MOSFET 100V, 80A, 9mΩ

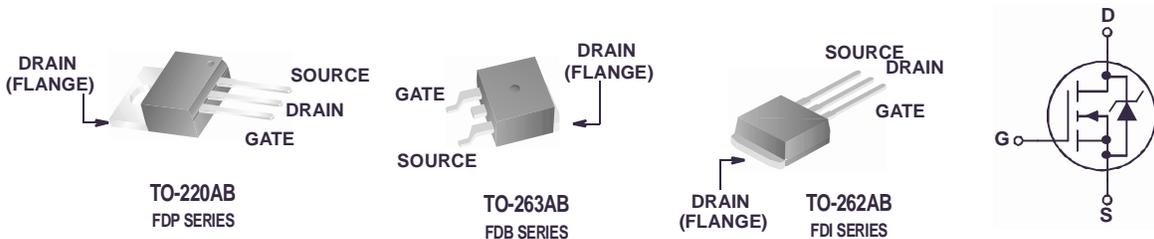
Features

- $r_{DS(ON)} = 7.5m\Omega$ (Typ.), $V_{GS} = 10V$, $I_D = 80A$
- $Q_g(tot) = 84nC$ (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 82784

Applications

- DC/DC converters and Off-Line UPS
- Distributed Power Architectures and VRMs
- Primary Switch for 24V and 48V Systems
- High Voltage Synchronous Rectifier
- Direct Injection / Diesel Injection Systems
- 42V Automotive Load Control
- Electronic Valve Train Systems



MOSFET Maximum Ratings $T_C = 25^\circ C$ unless otherwise noted

Symbol	Parameter	Ratings	Units
V_{DSS}	Drain to Source Voltage	100	V
V_{GS}	Gate to Source Voltage	± 20	V
I_D	Drain Current		
	Continuous ($T_C < 111^\circ C$, $V_{GS} = 10V$)	80	A
	Continuous ($T_{amb} = 25^\circ C$, $V_{GS} = 10V$, $R_{\theta JA} = 43^\circ C/W$)	12	A
	Pulsed	Figure 4	A
E_{AS}	Single Pulse Avalanche Energy (Note 1)	393	mJ
P_D	Power dissipation	310	W
	Derate above $25^\circ C$	2.07	W/ $^\circ C$
T_J, T_{STG}	Operating and Storage Temperature	-55 to 175	$^\circ C$

Thermal Characteristics

$R_{\theta JC}$	Thermal Resistance Junction to Case TO-220, TO-263, TO-262	0.48	$^\circ C/W$
$R_{\theta JA}$	Thermal Resistance Junction to Ambient TO-220, TO-262 (Note 2)	62	$^\circ C/W$
$R_{\theta JA}$	Thermal Resistance Junction to Ambient TO-263, 1in ² copper pad area	43	$^\circ C/W$

Package Marking and Ordering Information

Device Marking	Device	Package	Reel Size	Tape Width	Quantity
FDB3632	FDB3632	TO-263AB	330mm	24mm	800 units
FDP3632	FDP3632	TO-220AB	Tube	N/A	50 units
FDI3632	FDI3632	TO-262AA	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	$I_D = 250\mu\text{A}, V_{GS} = 0\text{V}$	100	-	-	V
I_{DSS}	Zero Gate Voltage Drain Current	$V_{DS} = 80\text{V}$ $V_{GS} = 0\text{V}$ $T_C = 150^\circ\text{C}$	-	-	1	μA
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	$I_D = 80\text{A}, V_{GS} = 10\text{V}$	-	0.0075	0.009	Ω
		$I_D = 40\text{A}, V_{GS} = 6\text{V}$	-	0.009	0.015	
		$I_D = 80\text{A}, V_{GS} = 10\text{V}, T_C = 175^\circ\text{C}$	-	0.018	0.022	

Dynamic Characteristics

C_{ISS}	Input Capacitance	$V_{DS} = 25\text{V}, V_{GS} = 0\text{V},$ $f = 1\text{MHz}$	-	6000	-	pF
C_{OSS}	Output Capacitance		-	820	-	pF
C_{RSS}	Reverse Transfer Capacitance		-	200	-	pF
$Q_{g(TOT)}$	Total Gate Charge at 10V	$V_{GS} = 0\text{V to } 10\text{V}$	-	84	110	nC
$Q_{g(TH)}$	Threshold Gate Charge	$V_{GS} = 0\text{V to } 2\text{V}$	-	11	14	nC
Q_{gs}	Gate to Source Gate Charge	$V_{DD} = 50\text{V}$ $I_D = 80\text{A}$ $I_g = 1.0\text{mA}$	-	30	-	nC
Q_{gs2}	Gate Charge Threshold to Plateau		-	20	-	nC
Q_{gd}	Gate to Drain "Miller" Charge		-	20	-	nC

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

t_{ON}	Turn-On Time	$V_{DD} = 50\text{V}, I_D = 80\text{A}$ $V_{GS} = 10\text{V}, R_{GS} = 3.6\Omega$	-	-	102	ns
$t_{d(ON)}$	Turn-On Delay Time		-	30	-	ns
t_r	Rise Time		-	39	-	ns
$t_{d(OFF)}$	Turn-Off Delay Time		-	96	-	ns
t_f	Fall Time		-	46	-	ns
t_{OFF}	Turn-Off Time		-	-	213	ns

Drain-Source Diode Characteristics

V_{SD}	Source to Drain Diode Voltage	$I_{SD} = 80\text{A}$	-	-	1.25	V
		$I_{SD} = 40\text{A}$	-	-	1.0	V
t_{rr}	Reverse Recovery Time	$I_{SD} = 75\text{A}, dI_{SD}/dt = 100\text{A}/\mu\text{s}$	-	-	64	ns
Q_{RR}	Reverse Recovered Charge	$I_{SD} = 75\text{A}, dI_{SD}/dt = 100\text{A}/\mu\text{s}$	-	-	120	nC

Notes:

- Starting $T_J = 25^\circ\text{C}$, $L = 0.12\text{mH}$, $I_{AS} = 75\text{A}$.
- Pulse Width = 100s

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

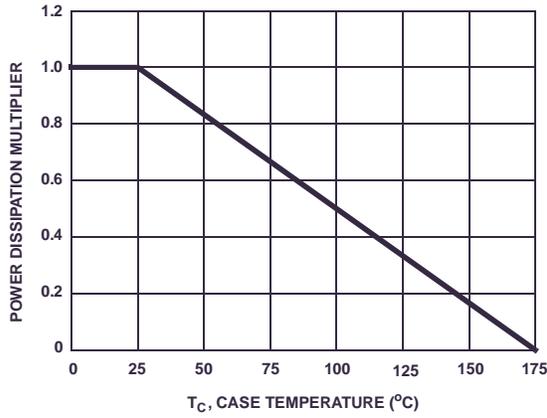


Figure 1. Normalized Power Dissipation vs Ambient Temperature

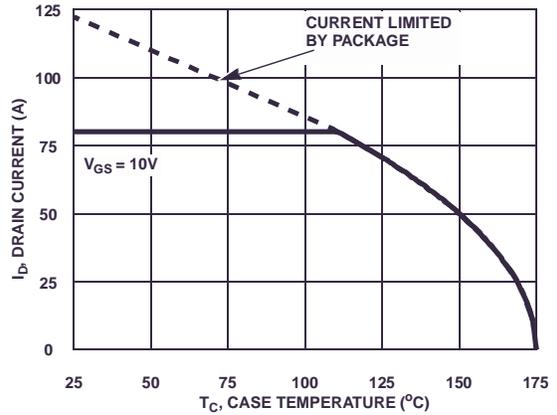


Figure 2. Maximum Continuous Drain Current vs Case Temperature

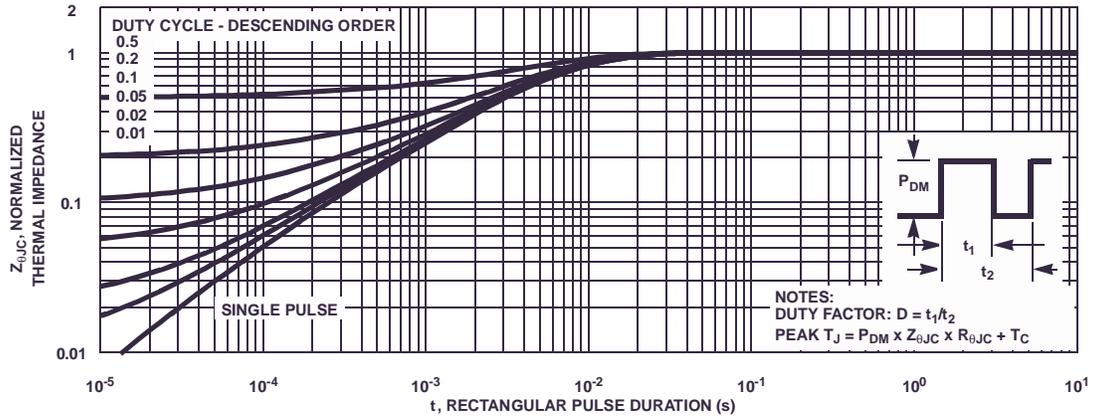


Figure 3. Normalized Maximum Transient Thermal Impedance

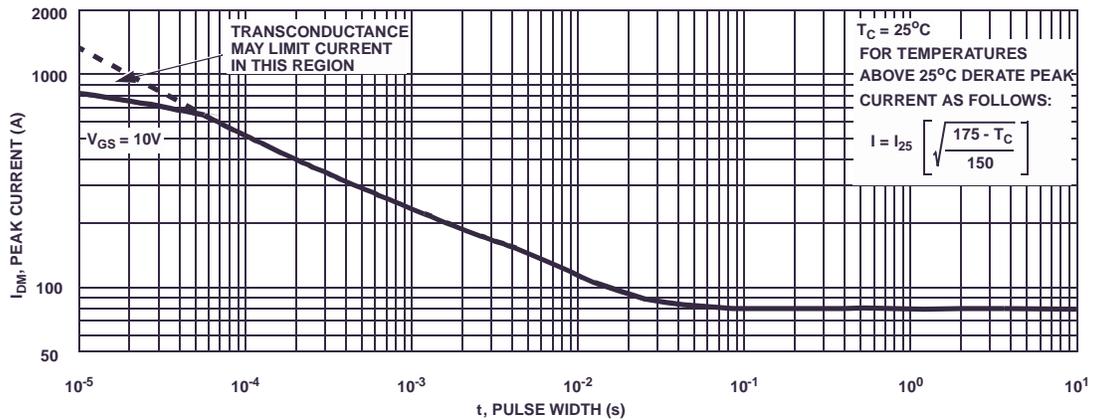


Figure 4. Peak Current Capability