FDB14AN06LA0 / FDP14AN06LA0

N-Channel PowerTrench® MOSFET
60V, 60A, 14.6mΩ

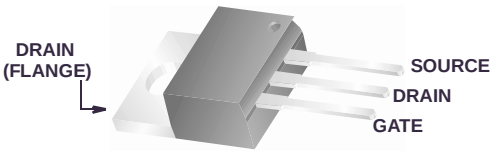
Features

- $r_{DS(ON)}$ = 12.8mΩ (Typ.), V_{GS} = 5V, I_D = 60A
- Q_g(tot) = 24nC (Typ.), V_{GS} = 5V
- Low Miller Charge
- Low Q_{RR} Body Diode
- UIS Capability (Single Pulse and Repetitive Pulse)
- Qualified to AEC Q101

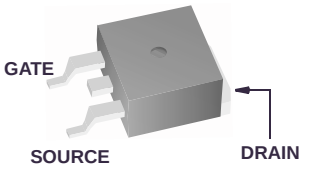
Formerly developmental type 83557

Applications

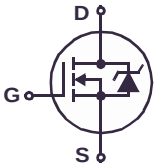
- Motor / Body Load Control
- ABS Systems
- Powertrain Management
- Injection Systems
- DC-DC converters and Off-line UPS
- Distributed Power Architectures and VRMs
- Primary Switch for 12V and 24V systems



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	60	V
V_{GS}	Gate to Source Voltage	±20	V
I_D	Drain Current Continuous (T_C = 25°C, V_{GS} = 10V)	67	A
	Continuous (T_C = 25°C, V_{GS} = 5V)	60	A
	Continuous (T_A = 25°C, V_{GS} = 5V, $R_{\theta JA}$ = 43°C/W)	10	A
	Pulsed	Figure 4	A
E_{AS}	Single Pulse Avalanche Energy (Note 1)	46	mJ
P_D	Power dissipation	125	W
	Derate above 25°C	0.83	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	1.2	°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

Package Marking and Ordering Information

Device Marking	Device	Package	Reel Size	Tape Width	Quantity
FDB14AN06LA0	FDB14AN06LA0	TO-263AB	330mm	24mm	800 units
FDP14AN06LA0	FDP14AN06LA0	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		60	-	-	V
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS} = 50V, V_{GS} = 0V		-	-	1	µA
			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		1	-	3	V
$r_{DS(ON)}$	Drain to Source On Resistance	I_D = 67A, V_{GS} = 10V		-	0.0102	0.0116	Ω
		I_D = 60A, V_{GS} = 5V		-	0.0128	0.0146	
		I_D = 60A, V_{GS} = 5V, T_J = 175°C		-	0.028	0.033	
Dynamic Characteristics							
C_{ISS}	Input Capacitance	V_{DS} = 25V, V_{GS} = 0V, f = 1MHz		-	2900	-	pF
C_{OSS}	Output Capacitance			-	270	-	pF
C_{RSS}	Reverse Transfer Capacitance			-	115	-	pF
$Q_{g(TOT)}$	Total Gate Charge at 5V	V_{GS} = 0V to 5V	V_{DD} = 30V, I_D = 60A, I_g = 1.0mA		24	31	nC
$Q_{g(TH)}$	Threshold Gate Charge	V_{GS} = 0V to 1V		-	3.0	3.9	nC
Q_{gs}	Gate to Source Gate Charge			-	12	-	nC
Q_{gs2}	Gate Charge Threshold to Plateau			-	9.1	-	nC
Q_{gd}	Gate to Drain “Miller” Charge			-	7.9	-	nC
Switching Characteristics (V_{GS} = 5V)							
t_{ON}	Turn-On Time	V_{DD} = 30V, I_D = 60A, V_{GS} = 5V, R_{GS} = 5.1Ω		-	-	276	ns
$t_{d(ON)}$	Turn-On Delay Time			-	15	-	ns
t_r	Rise Time			-	169	-	ns
$t_{d(OFF)}$	Turn-Off Delay Time			-	24	-	ns
t_f	Fall Time			-	50	-	ns
t_{OFF}	Turn-Off Time			-	-	109	ns
Drain-Source Diode Characteristics							
V_{SD}	Source to Drain Diode Voltage	I_{SD} = 60A		-	-	1.25	V
		I_{SD} = 30A		-	-	1.0	V
t_{rr}	Reverse Recovery Time	I_{SD} = 60A, dI_{SD}/dt = 100A/µs		-	-	33	ns
Q_{RR}	Reverse Recovered Charge	I_{SD} = 60A, dI_{SD}/dt = 100A/µs		-	-	29	nC

Notes:
1: Starting T_J = 25°C, L = 40µH, I_{AS} = 48A.
2: Pulse width = 100s.

Typical Characteristics T_C = 25°C unless otherwise noted

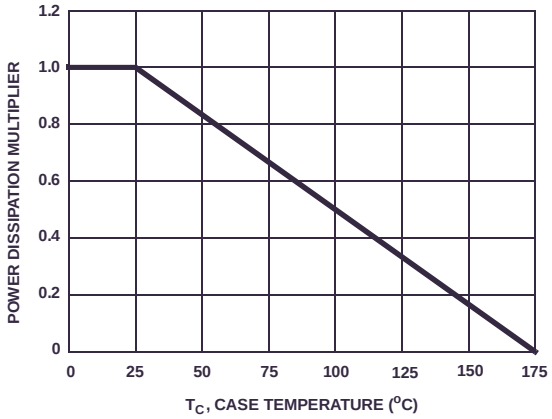


Figure 1. Normalized Power Dissipation vs Ambient Temperature

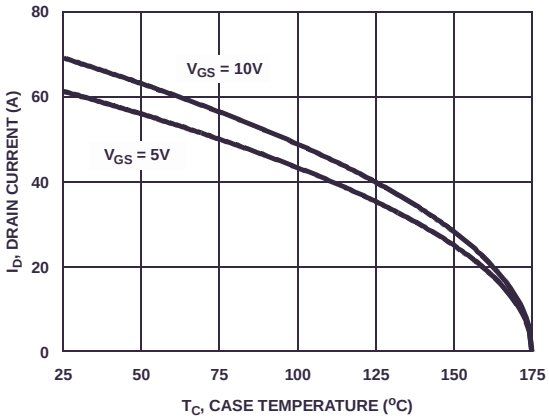


Figure 2. Maximum Continuous Drain Current vs Case Temperature

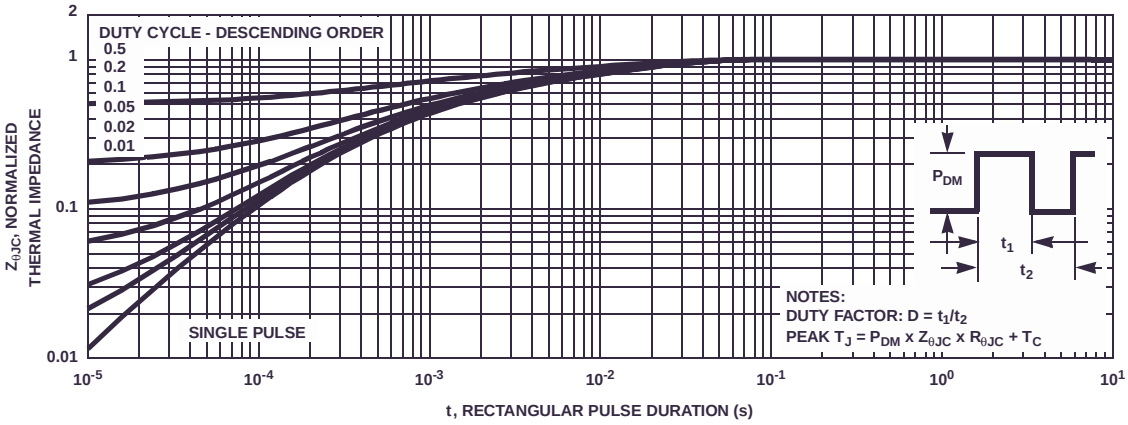


Figure 3. Normalized Maximum Transient Thermal Impedance

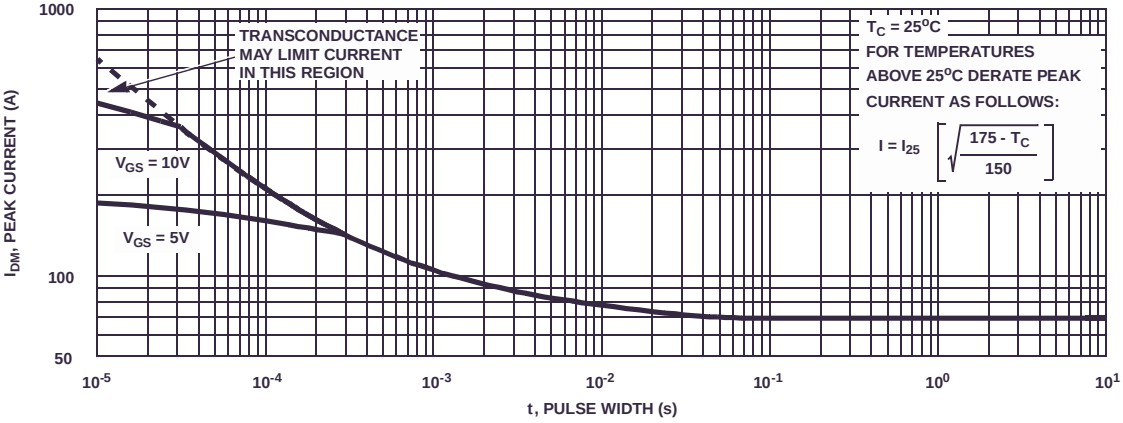


Figure 4. Peak Current Capability