

International
IR Rectifier

PROVISIONAL
SMPS MOSFET

PD - 93800A
IRFBA35N60C

HEXFET® Power MOSFET

Applications

- Switch Mode Power Supply (SMPS)
- Uninterruptible Power Supply
- High Speed Power Switching

V_{DS}	$R_{DS(on)}$ max	I_D
600V	0.080Ω	35A

Benefits

- Low Gate Charge Q_g Reduces Drive Required
- Improved Gate Resistance for Faster Switching
- Fully Characterized Capacitance and Avalanche Voltage and Current
- Lowest Conduction Loss in Package Outline
- Effective C_{OSS} specified (See AN 1001)



Absolute Maximum Ratings

	Parameter	Max.	Units
I_D @ $T_C = 25^\circ\text{C}$	Continuous Drain Current, V_{GS} @ 10V	35	A
I_D @ $T_C = 100^\circ\text{C}$	Continuous Drain Current, V_{GS} @ 10V	22	
I_{DM}	Pulsed Drain Current ①	140	
P_D @ $T_C = 25^\circ\text{C}$	Power Dissipation	250	W
	Linear Derating Factor	2.0	W/°C
V_{GS}	Gate-to-Source Voltage	± 20	V
dv/dt	Peak Diode Recovery dv/dt ②	TBD	V/ns
T_J	Operating Junction and	-40 to + 150	
T_{STG}	Storage Temperature Range	-55 to + 150	
	Soldering Temperature, for 10 seconds	300 (1.6mm from case)	
	Recommended clip force	20	N

Applicable Off Line SMPS Topologies:

- Power Factor Correction Boost
- Full Bridge

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Static @ $T_J = 25^\circ\text{C}$ (unless otherwise specified)

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	Parameter	Min.	Typ.	Max.	Units	Conditions
$V_{(BR)DSS}$	Drain-to-Source Breakdown Voltage	600	—	—	V	$V_{GS} = 0V, I_D = 250\mu A$
$\Delta V_{(BR)DSS}/\Delta T_J$	Breakdown Voltage Temp. Coefficient	—	0.54	—	V/°C	Reference to $25^\circ\text{C}, I_D = 1mA$ ⑥
$R_{DS(on)}$	Static Drain-to-Source On-Resistance	—	—	0.080	Ω	$V_{GS} = 10V, I_D = 21A$ ④
$V_{GS(th)}$	Gate Threshold Voltage	4.0	—	6.0	V	$V_{DS} = V_{GS}, I_D = 250\mu A$
I_{DSS}	Drain-to-Source Leakage Current	—	—	100	μA	$V_{DS} = 600V, V_{GS} = 0V$
		—	—	500		$V_{DS} = 480V, V_{GS} = 0V, T_J = 125^\circ\text{C}$
I_{GSS}	Gate-to-Source Forward Leakage	—	—	100	nA	$V_{GS} = 20V$
	Gate-to-Source Reverse Leakage	—	—	-100		$V_{GS} = -20V$

Dynamic @ $T_J = 25^\circ\text{C}$ (unless otherwise specified)

	Parameter	Min.	Typ.	Max.	Units	Conditions
g_{fs}	Forward Transconductance	16	—	—	S	$V_{DS} = 50V, I_D = 21A$
Q_g	Total Gate Charge	—	—	280	nC	$I_D = 21A$
Q_{gs}	Gate-to-Source Charge	—	—	59		$V_{DS} = 360V$
Q_{gd}	Gate-to-Drain ("Miller") Charge	—	—	140		$V_{GS} = 10V$ ④
$t_{d(on)}$	Turn-On Delay Time	—	28	—	ns	$V_{DD} = 300V$
t_r	Rise Time	—	89	—		$I_D = 21A$
$t_{d(off)}$	Turn-Off Delay Time	—	62	—		$R_G = 1.3\Omega$
t_f	Fall Time	—	33	—		$R_D = 14\Omega$ ④
C_{iss}	Input Capacitance	—	6170	—	pF	$V_{GS} = 0V$
C_{oss}	Output Capacitance	—	3030	—		$V_{DS} = 25V$
C_{rss}	Reverse Transfer Capacitance	—	160	—		$f = 1.0MHz$
C_{oss}	Output Capacitance	—	14310	—		$V_{GS} = 0V, V_{DS} = 1.0V, f = 1.0MHz$
C_{oss}	Output Capacitance	—	132	—		$V_{GS} = 0V, V_{DS} = 480V, f = 1.0MHz$
$C_{oss \text{ eff.}}$	Effective Output Capacitance	—	216	—		$V_{GS} = 0V, V_{DS} = 0V \text{ to } 480V$ ⑤

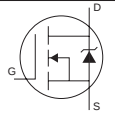
Avalanche Characteristics

	Parameter	Typ.	Max.	Units
E_{AS}	Single Pulse Avalanche Energy②	—	TBD	mJ
I_{AR}	Avalanche Current①	—	21	A
E_{AR}	Repetitive Avalanche Energy①	—	25	mJ

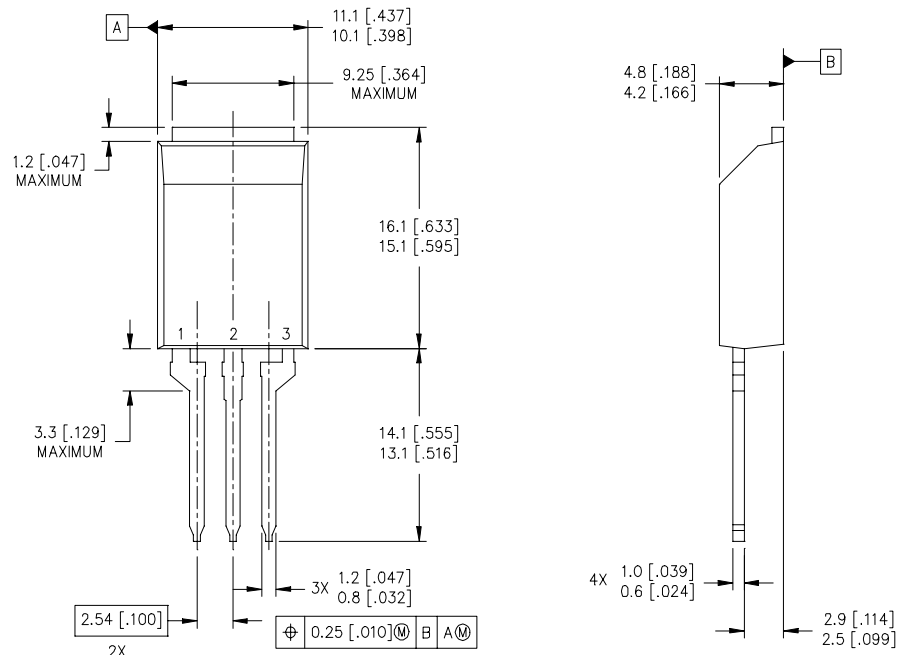
Thermal Resistance

	Parameter	Typ.	Max.	Units
$R_{\theta JC}$	Junction-to-Case	—	0.50	°C/W
$R_{\theta CS}$	Case-to-Sink, Flat, Greased Surface	0.5	—	
$R_{\theta JA}$	Junction-to-Ambient	—	58	

Diode Characteristics

	Parameter	Min.	Typ.	Max.	Units	Conditions
I_S	Continuous Source Current (Body Diode)	—	—	35	A	MOSFET symbol showing the integral reverse p-n junction diode. 
I_{SM}	Pulsed Source Current (Body Diode) ①	—	—	140		
V_{SD}	Diode Forward Voltage	—	—	1.5	V	$T_J = 25^\circ\text{C}, I_S = 21A, V_{GS} = 0V$ ④
t_{rr}	Reverse Recovery Time	—	550	820	ns	$T_J = 25^\circ\text{C}, I_F = 21A$
Q_{rr}	Reverse Recovery Charge	—	12	18	μC	$di/dt = 100A/\mu s$ ④
t_{on}	Forward Turn-On Time	Intrinsic turn-on time is negligible (turn-on is dominated by $L_S + L_D$)				

Super-220™ Package Outline



NOTES:

1. DIMENSIONING & TOLERANCING PER ASME Y14.5M-1994.
2. CONTROLLING DIMENSION: MILLIMETER.
3. DIMENSIONS ARE SHOWN IN MILLIMETERS [INCHES].
4. OUTLINE CONFORMS TO JEDEC OUTLINE TO-273AA.

LEAD ASSIGNMENTS

HEXFET	IGBT
1 - GATE	1 - GATE
2 - DRAIN	2 - COLLECTOR
3 - SOURCE	3 - EMITTER
4 - DRAIN	4 - COLLECTOR

Notes:

- ① Repetitive rating; pulse width limited by max. junction temperature.
- ② Starting $T_J = 25^\circ\text{C}$, $L = \text{TBDmH}$, $R_G = 25\Omega$, $I_{AS} = 35\text{A}$, $dv/dt = \text{TBD V/ns}$.
- ③ $I_{SD} \leq \text{TBDA}$, $di/dt \leq \text{TBDA}/\mu\text{s}$, $V_{DD} \leq V_{(BR)DSS}$, $T_J \leq 150^\circ\text{C}$.
- ④ Pulse width $\leq 300\mu\text{s}$; duty cycle $\leq 2\%$.