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FDMC8321L N-Channel Power Trench[®] MOSFET 40 V, 49 A, 2.5 m Ω

Features

- Max $r_{DS(on)}$ = 2.5 m Ω at V_{GS} = 10 V, I_D = 22 A
- Max $r_{DS(on)}$ = 4.1 m Ω at V_{GS} = 4.5 V, I_D = 18 A
- Advanced Package and Silicon combination for low r_{DS(on)} and hign efficiency
- Next Generation enhanced body diode technology, engineered for soft recovery
- 100% UIL tested
- RoHS Compliant

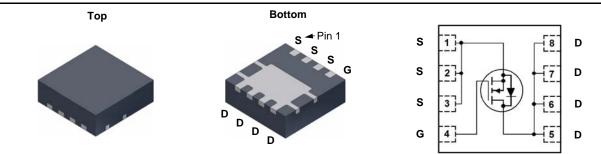


General Description

This N-Channel MOSFET has been designed specifically to improve the overall efficiency and to minimize switch node ringing of DC/DC converters using either synchronous or convertional switching PWM contollers. It has been optimized for low gate charge, low $r_{DS(on)}$, fast switching speed body diode reverse recovery performance.

Applications

- Synchronous rectifier
- Load switch/Orring
- Motor switch



Power 33

MOSFET Maximum Ratings T_A = 25 °C unless otherwise noted

Symbol	Parameter			Ratings	Units			
V _{DS}	Drain to Source Voltage			40	V			
V _{GS}	Gate to Source V	/oltage			±20	V		
	Drain Current	-Continuous	T _C = 25 °C		49			
I _D		-Continuous	T _A = 25 °C	(Note 1a)	22	А		
		-Pulsed			100			
E _{AS}	Single Pulse Ava	lanche Energy		(Note 3)	86	mJ		
P _D	Power Dissipatio	n	T _C = 25 °C		40	w		
	Power Dissipation	Power Dissipation		(Note 1a)	2.3	vv		
T _J , T _{STG}	Operating and Storage Junction Temperature Range				-55 to +150	°C		

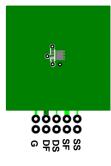
Thermal Characteristics

$R_{ ext{ heta}JC}$	Thermal Resistance, Junction to Case	(Note 1)	3.1	°C/W	
$R_{\theta JA}$	Thermal Resistance, Junction to Ambient	(Note 1a)	53	C/VV	

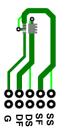
Package Marking and Ordering Information

Device Marking	Device	Package	Reel Size	Tape Width	Quantity
FDMC8321L	FDMC8321L	Power33	13 "	12 mm	3000 units

	al Characteristics $T_J = 25 \text{ °C}$ unle					
Symbol	Parameter	Test Conditions	Min	Тур	Max	Units
Off Chara	acteristics					
BV _{DSS}	Drain to Source Breakdown Voltage	I _D = 250 μA, V _{GS} = 0 V	40			V
ΔBV _{DSS} ΔTJ	Breakdown Voltage Temperature Coefficient	$I_D = 250 \ \mu\text{A}$, referenced to 25 °C		22		mV/°C
I _{DSS}	Zero Gate Voltage Drain Current	$V_{DS} = 32 \text{ V}, V_{GS} = 0 \text{ V}$			1	μA
I _{GSS}	Gate to Source Leakage Current	$V_{GS} = \pm 20 \text{ V}, \text{ V}_{DS} = 0 \text{ V}$			±100	nA
On Chara	octeristics					
V _{GS(th)}	Gate to Source Threshold Voltage	$V_{GS} = V_{DS}, \ I_{D} = 250 \ \mu A$	1	1.7	3	V
$\frac{\Delta V_{GS(th)}}{\Delta T_J}$	Gate to Source Threshold Voltage Temperature Coefficient	$I_D = 250 \ \mu$ A, referenced to 25 °C		-5		mV/°C
r _{DS(on)}	Static Drain to Source On Resistance	V _{GS} = 10 V, I _D = 22 A	1.9 2.5			
		V _{GS} = 4.5 V, I _D = 18 A		2.7	4.1	mΩ
		V_{GS} = 10 V, I _D = 22 A, T _J = 125 °C		2.8	3.7	
9 _{FS}	Forward Transconductance	$V_{DS} = 5 V, I_{D} = 22 A$		114		S
-	Characteristics			T	1	
C _{iss}	Input Capacitance	V _{DS} = 20 V, V _{GS} = 0 V,		2930	3900	pF
C _{oss}	Output Capacitance	-f = 1 MHz		1000	1330	pF
C _{rss}	Reverse Transfer Capacitance			60	90	pF
R _g	Gate Resistance		0.1	0.7	2.5	Ω
Switching	g Characteristics					
t _{d(on)}	Turn-On Delay Time			12	22	ns
t _r	Rise Time	V _{DD} = 20 V, I _D = 22 A,		6.1	12	ns
t _{d(off)}	Turn-Off Delay Time	V_{GS} = 10 V, R_{GEN} = 6 Ω		32	51	ns
t _f	Fall Time			4.9	10	ns
Q _{g(TOT)}	Total Gate Charge at 10 V			44	61	nC
Q _{g(TOT)}	Total Gate Charge at 5 V	– V _{DD} = 20 V, I _D = 22 A		21	32	nC
Q _{gs}	Total Gate Charge	VDD - 20 V, ID - 22 A		7.7		nC
Q _{gd}	Gate to Drain "Miller" Charge			5.8		nC
Drain-Sou	urce Diode Characteristics					
N/	Source to Drain Diade, Forward Valtage	$V_{GS} = 0 V, I_S = 2 A$ (Note 2)		0.69	1.2	V
V _{SD}	Source to Drain Diode Forward Voltage	$V_{GS} = 0 V, I_S = 22 A$ (Note 2)		0.77	1.3	v
t _{rr}	Reverse Recovery Time	I _F = 22 A, di/dt = 100 A/μs		41	65	ns
Q _{rr}	Reverse Recovery Charge	F = 22 A, ui/ul = 100 A/µS		20	33	nC



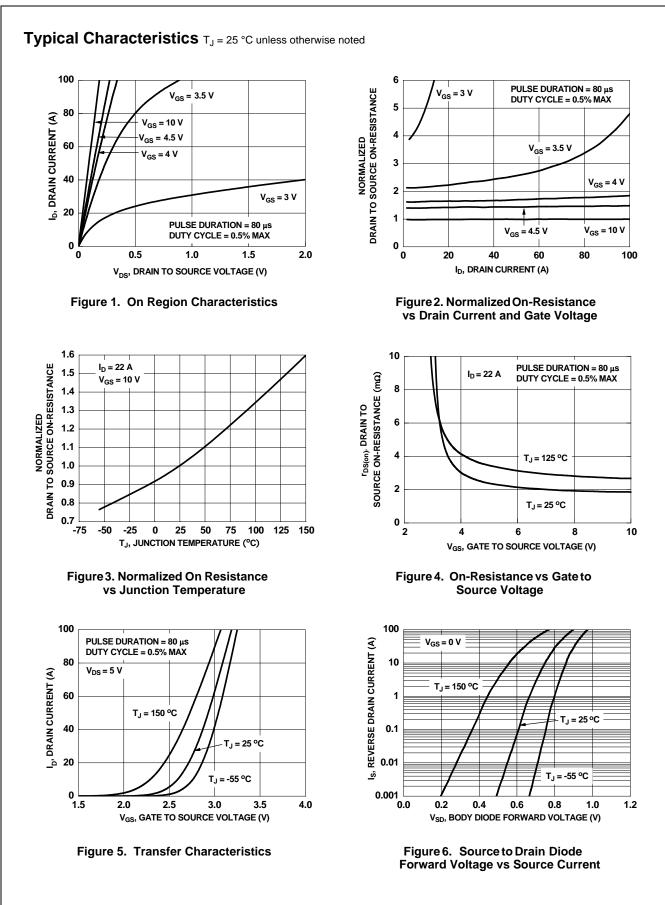
53 °C/W when mounted on a 1 in² pad of 2 oz copper



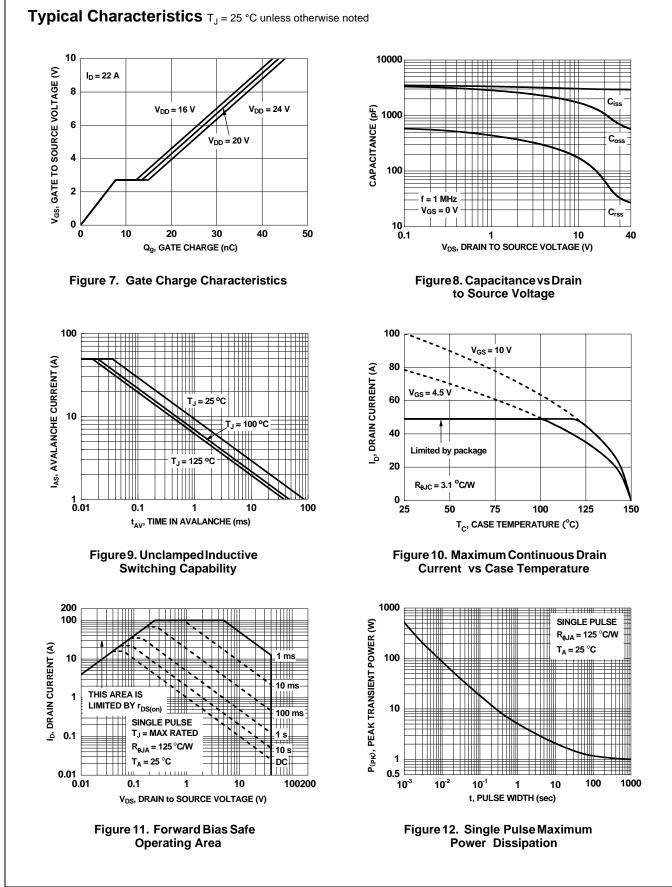
125 °C/W when mounted on a minimum pad of 2 oz copper

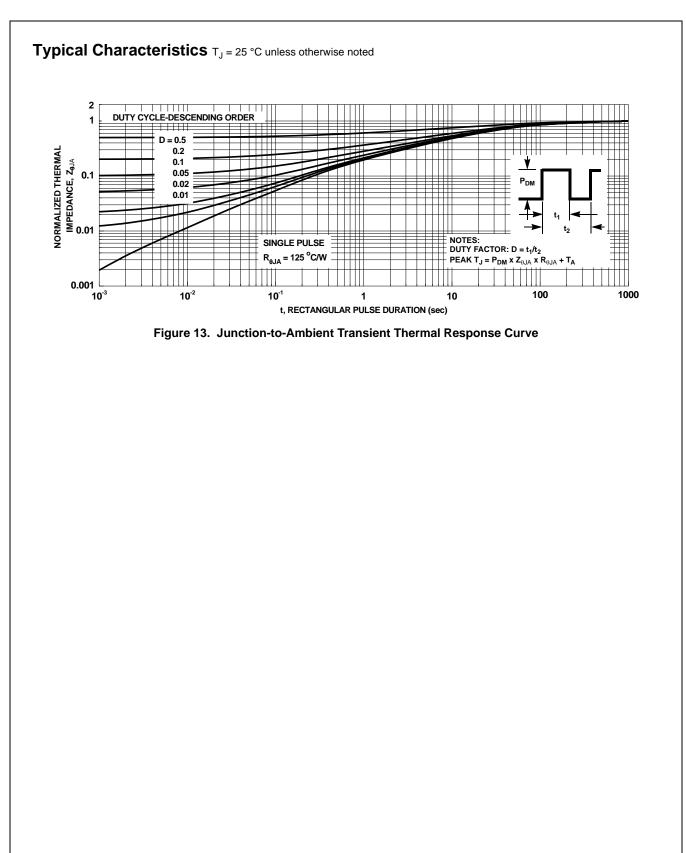
2. Pulse Test: Pulse Width < 300 $\mu s,$ Duty cycle < 2.0%.

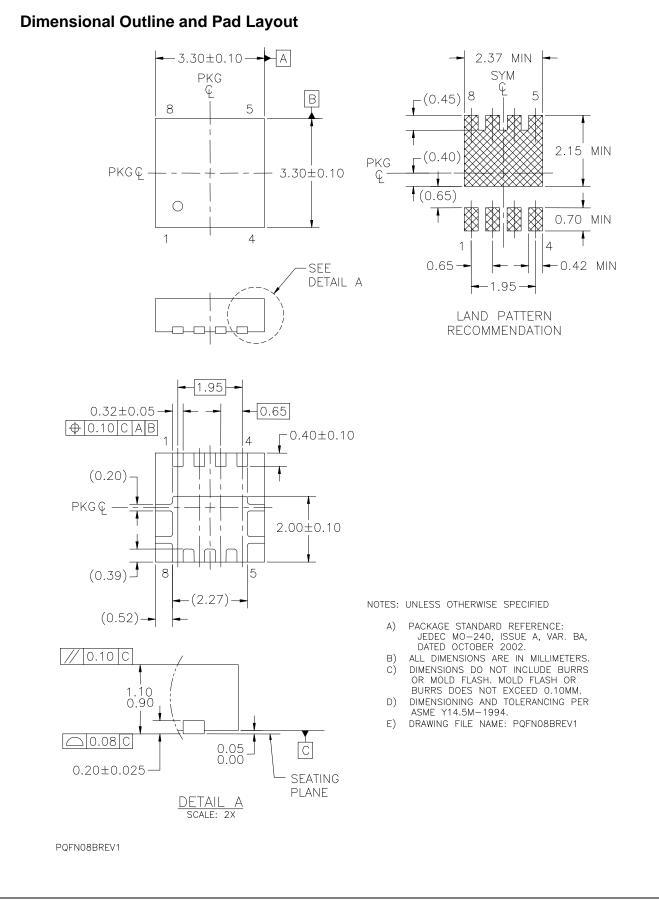
3.Starting T_J = 25 °C; N-ch: L = 0.3 mH, I_{AS} = 24 \text{ A}, V_{DD} = 36 V, V_{GS} = 10 V.











FDMC8321L N-Channel PowerTrench[®] MOSFET



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FDMC8321L N-Channel PowerTrench[®] MOSFE⁻

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