

FDMS86201-VB Datasheet

N-Channel 100-V (D-S) MOSFET

PRODUCT SUMMARY

$V_{(BR)DSS}$ (V)	$r_{DS(on)}$ (Ω)	I_D (A)
100	0.009 at $V_{GS} = 10$ V	65

FEATURES

- TrenchFET® Power MOSFET
- 175 °C Junction Temperature
- Low Thermal Resistance Package
- 100 % R_g Tested



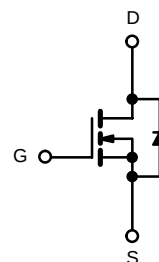
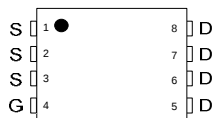
RoHS
COMPLIANT

APPLICATIONS

- Isolated DC/DC Converters



Top View



N-Channel MOSFET

ABSOLUTE MAXIMUM RATINGS ($T_A = 25$ °C, unless otherwise noted)

PARAMETER		SYMBOL	LIMIT	UNIT
Drain-source voltage		V_{DS}	100	V
Gate-source voltage		V_{GS}	± 20	
Continuous drain current ($T_J = 150$ °C)	$T_C = 25$ °C	I_D	65	A
	$T_C = 70$ °C		60	
	$T_A = 25$ °C		20 ^{b, c}	
	$T_A = 70$ °C		18.5 ^{b, c}	
Pulsed drain current ($t = 100$ μ s)		I_{DM}	180	A
Continuous source-drain diode current	$T_C = 25$ °C	I_S	60	
	$T_A = 25$ °C		4.8 ^{b, c}	
Single pulse avalanche current	$L = 0.1$ mH	I_{AS}	30	mJ
Single pulse avalanche energy		E_{AS}	40	
Maximum power dissipation	$T_C = 25$ °C	P_D	80	W
	$T_C = 70$ °C		50	
	$T_A = 25$ °C		5 ^{b, c}	
	$T_A = 70$ °C		3.2 ^{b, c}	
Operating junction and storage temperature range		T_J, T_{stg}	-55 to +150	°C

SPECIFICATIONS ($T_J = 25\text{ }^{\circ}\text{C}$, unless otherwise noted)						
PARAMETER	SYMBOL	TEST CONDITIONS	MIN.	TYP.	MAX.	UNIT
Static						
Drain-source breakdown voltage	V_{DS}	$V_{GS} = 0\text{ V}$, $I_D = 250\text{ }\mu\text{A}$	100	-	-	V
V_{DS} temperature coefficient	$\Delta V_{DS}/T_J$	$I_D = 10\text{ mA}$	-	81	-	mV/ $^{\circ}\text{C}$
$V_{GS(th)}$ temperature coefficient	$\Delta V_{GS(th)}/T_J$	$I_D = 250\text{ }\mu\text{A}$	-	-7.5	-	
Gate-source threshold voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}$, $I_D = 250\text{ }\mu\text{A}$	3	-	5	V
Gate-source leakage	I_{GSS}	$V_{DS} = 0\text{ V}$, $V_{GS} = \pm 20\text{ V}$	-	-	100	nA
Zero gate voltage drain current	I_{DSS}	$V_{DS} = 100\text{ V}$, $V_{GS} = 0\text{ V}$	-	-	1	μA
		$V_{DS} = 100\text{ V}$, $V_{GS} = 0\text{ V}$, $T_J = 70\text{ }^{\circ}\text{C}$	-	-	15	
On-state drain current ^a	$I_{D(on)}$	$V_{DS} \geq 10\text{ V}$, $V_{GS} = 10\text{ V}$	40	-	-	A
Drain-source on-state resistance ^a	$R_{DS(on)}$	$V_{GS} = 10\text{ V}$, $I_D = 10\text{ A}$	-	0.009	-	Ω
		$V_{GS} = 7.5\text{ V}$, $I_D = 10\text{ A}$	-	0.012	-	
Forward transconductance ^a	g_{fs}	$V_{DS} = 15\text{ V}$, $I_D = 10\text{ A}$	-	46	-	S
Dynamic ^b						
Input capacitance	C_{iss}	$V_{DS} = 50\text{ V}$, $V_{GS} = 0\text{ V}$, $f = 1\text{ MHz}$	-	3970	-	pF
Output capacitance	C_{oss}		-	132	-	
Reverse transfer capacitance	C_{rss}		-	11.2	-	
Total gate charge	Q_g	$V_{DS} = 50\text{ V}$, $V_{GS} = 10\text{ V}$, $I_D = 10\text{ A}$	-	20	-	nC
Gate-source charge	Q_{gs}	$V_{DS} = 50\text{ V}$, $V_{GS} = 7.5\text{ V}$, $I_D = 10\text{ A}$	-	15	-	
Gate-drain charge	Q_{gd}		-	6.45	-	
Output charge	Q_{oss}		-	3.5	-	
Gate resistance	R_g	$V_{DS} = 50\text{ V}$, $V_{GS} = 0\text{ V}$	-	22	-	
Turn-on delay time	$t_{d(on)}$	$f = 1\text{ MHz}$	0.2	0.76	1.4	Ω
Rise time	t_r		-	12	24	ns
Turn-off delay time	$t_{d(off)}$		-	5	10	
Fall time	t_f		-	19	38	
Turn-on delay time	$t_{d(on)}$	$V_{DD} = 50\text{ V}$, $R_L = 5\text{ }\Omega$, $I_D \cong$				

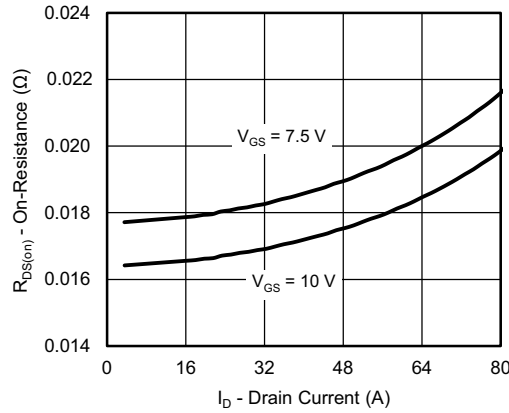
TYPICAL CHARACTERISTICS (25 °C, unless otherwise noted)



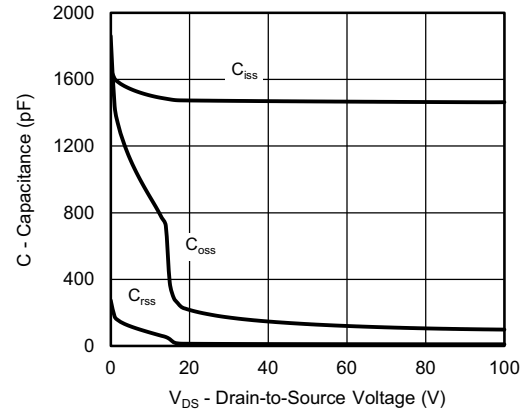
Output Characteristics



Transfer Characteristics



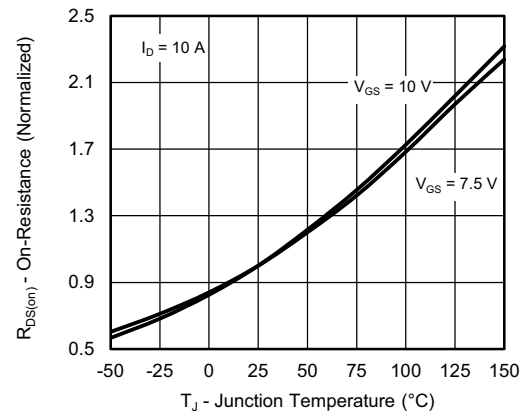
On-Resistance vs. Drain Current and Gate Voltage



Capacitance



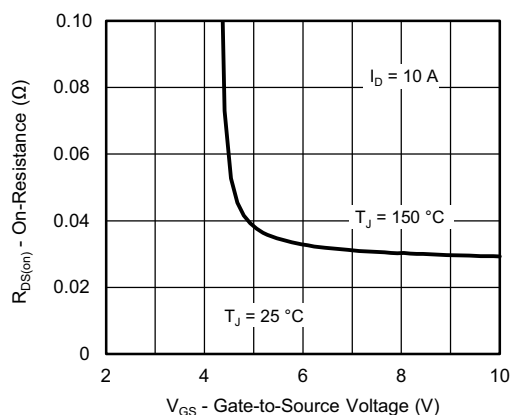
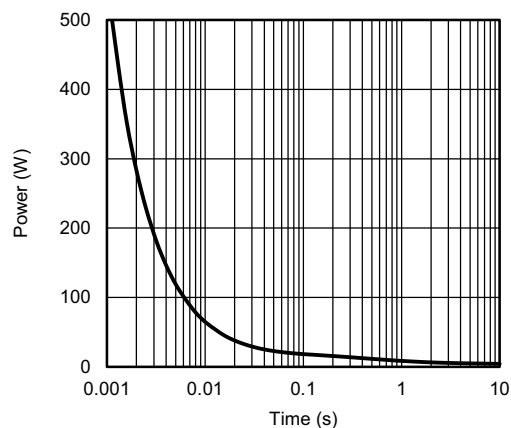
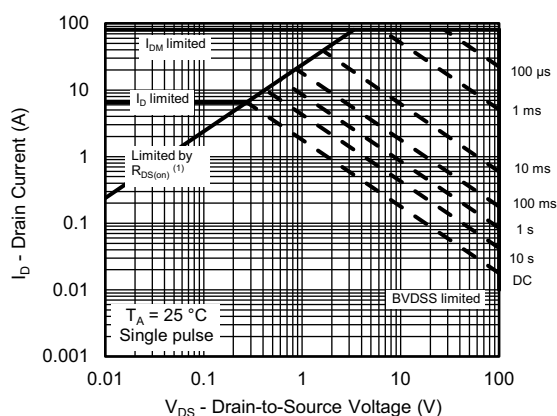
Gate Charge



On-Resistance vs. Junction Temperature

TYPICAL CHARACTERISTICS (25 °C, unless otherwise noted)

Source-Drain Diode Forward Voltage

Threshold Voltage

On-Resistance vs. Gate-to-Source Voltage

Single Pulse Power, Junction-to-Ambient


(1) $V_{GS} >$ minimum V_{GS} at which $R_{DS(on)}$ is specified

Safe Operating Area, Junction-to-Ambient

TYPICAL CHARACTERISTICS (25 °C, unless otherwise noted)

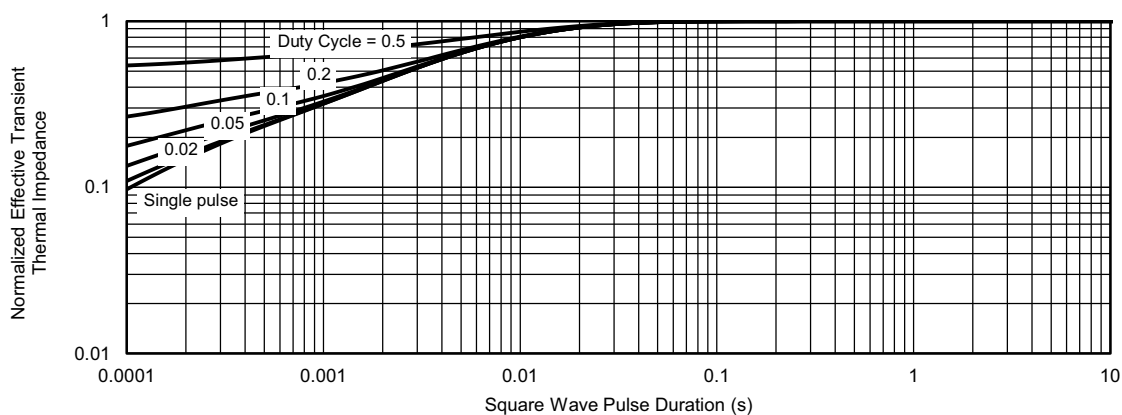
Current Derating ^a

Power, Junction-to-Case

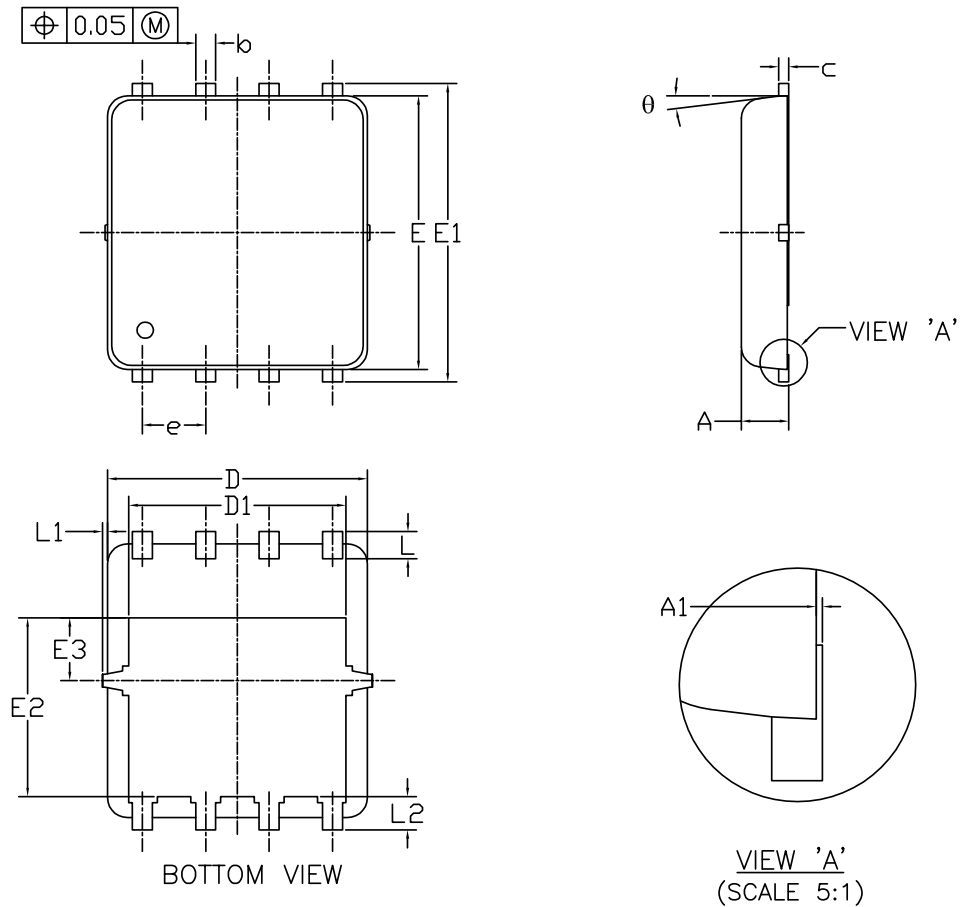
Power, Junction-to-Ambient
Note

- a. The power dissipation P_D is based on $T_J \text{ max.} = 150 \text{ }^\circ\text{C}$, using junction-to-case thermal resistance, and is more useful in settling the upper dissipation limit for cases where additional heatsinking is used. It is used to determine the current rating, when this rating falls below the package limit

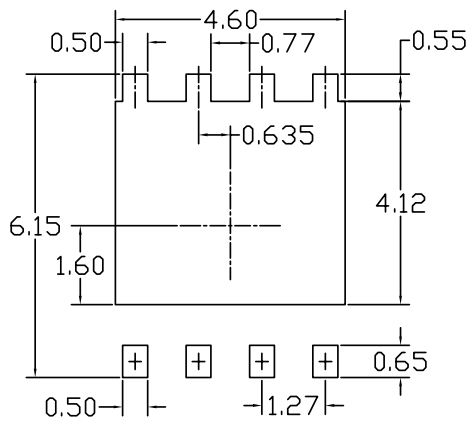
TYPICAL CHARACTERISTICS (25 °C, unless otherwise noted)

Normalized Thermal Transient Impedance, Junction-to-Ambient

Normalized Thermal Transient Impedance, Junction-to-Case

DFN5x6_8L_EP1_P PACKAGE OUTLIN



RECOMMENDED LAND PATTERN



SYMBOLS	DIMENSIONS IN MILLIMETERS			DIMENSIONS IN INCHES		
	MIN	NOM	MAX	MIN	NOM	MAX
A	0.85	0.95	1.00	0.033	0.037	0.039
A1	0.00	---	0.05	0.000	---	0.002
b	0.30	0.40	0.50	0.012	0.016	0.020
c	0.15	0.20	0.25	0.006	0.008	0.010
D	5.10	5.20	5.30	0.201	0.205	0.209
D1	4.25	4.35	4.45	0.167	0.171	0.175
E	5.45	5.55	5.65	0.215	0.219	0.222
E1	5.95	6.05	6.15	0.234	0.238	0.242
E2	3.525	3.625	3.725	0.139	0.143	0.147
E3	1.175	1.275	1.375	0.046	0.050	0.054
e	1.27 BSC			0.050 BSC		
L	0.45	0.55	0.65	0.018	0.022	0.026
L1	0	---	0.15	0	---	0.006
L2	0.68 REF			0.027 REF		
θ	0°	---	10°	0°	---	10°

NOTE

UNIT: mm

- PACKAGE BODY SIZES EXCLUDE MOLD FLASH AND GATE BURRS.
MOLD FLASH AT THE NON-LEAD SIDES SHOULD BE LESS THAN 6 MILS EACH.
- CONTROLLING DIMENSION IS MILLIMETER.
CONVERTED INCH DIMENSIONS ARE NOT NECESSARILY EXACT.

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