

N-Channel Enhancement Mode Power MOSFET

General Description

The FDH150N06AM uses advanced trench technology and design to provide excellent $R_{DS(ON)}$ with low gate charge. This device is suitable for use in PWM, load switching and general purpose applications.



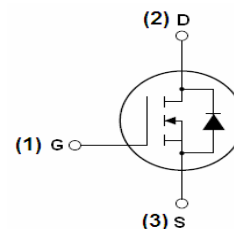
Features

- $V_{DS}=60V$; $I_D=150A@ V_{GS}=10V$;
 $R_{DS(ON)} < 4.5 m\Omega @ V_{GS} = 10V$
- Special process technology for high ESD capability
- Special designed for Convertors and power controls
- High density cell design for ultra low R_{dson}
- Fully characterized Avalanche voltage and current
- Good stability and uniformity with high E_{AS}
- Excellent package for good heat dissipation

Application

- Power switching application
- Hard Switched and High Frequency Circuits
- Uninterruptible Power Supply

TO-247-3AL top view



Schematic diagram

Package Marking And Ordering Information

Part ID	Marking	Device Package	Tape and Reel information
FDH150N06AM	FDH150N06	TO-247-3AL	30PCS/Tube

Table 1. Absolute Maximum Ratings (TA=25°C)

Parameter	Symbol	Value	Unit
Drain-Source Voltage ($V_{GS}=0V$)	V_{DS}	60	V
Gate-Source Voltage ($V_{DS}=0V$)	V_{GS}	± 20	V
Drain Current (DC) at $T_c=25^\circ C$	$I_{D(DC)}$	150	A
Drain Current (DC) at $T_c=100^\circ C$	$I_{D(DC)}$	90	A
Drain Current-Continuous@ Current-Pulsed (Note 1)	$I_{DM(pluse)}$	300	A
Maximum Power Dissipation($T_c=25^\circ C$)	P_D	200	W
Derating factor		1.33	W/°C
Single pulse avalanche energy (Note 2)	E_{AS}	950	mJ
Operating Junction and Storage Temperature Range	T_J, T_{STG}	-55 To 175	°C

Notes 1.Repetitive Rating: Pulse width limited by maximum junction temperature

2.EAS condition: $T_J=25^\circ C, V_{DD}=28V, V_G=10V, L=0.5mH, R_g=25\Omega$;

Table 2. Thermal Characteristic

Parameter	Symbol	Value	Unit
Thermal Resistance, Junction-to-Case (Note2)	R_{thJC}	0.75	$^{\circ}C/W$

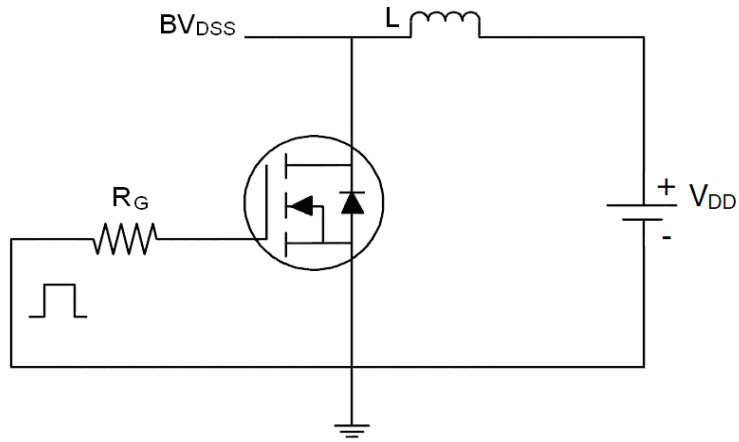
Table 3. Electrical Characteristics (TA=25 $^{\circ}C$ unless otherwise noted)

Parameter	Symbol	Condition	Min	Typ	Max	Unit
Off Characteristics						
Drain-Source Breakdown Voltage	BV_{DSS}	$V_{GS}=0V, I_D=250\mu A$	60			V
Zero Gate Voltage Drain Current(Tc=25 $^{\circ}C$)	I_{DSS}	$V_{DS}=-24V, V_{GS}=0V$			1	μA
Gate-Body Leakage Current	I_{DSS}	$V_{GS}=\pm 25V, V_{DS}=0V$			± 100	μA
On Characteristics (Note 3)						
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=250\mu A$	2	-	4	V
Drain-Source On-State Resistance	$R_{DS(on)}$	$V_{GS}=10V, I_D=40A$		4.5	6	m Ω
Dynamic Characteristics						
Forward Transconductance	G_{FS}	$V_{DS}=25V, I_D=40A$	50			S
Input Capacitance	C_{iss}	$V_{DS}=30V, V_{GS}=0V,$ $F=1.0MHz$		3000		PF
Output Capacitance	C_{oss}			430		PF
Reverse Transfer Capacitance	C_{rss}			240		PF
Total Gate Charge	Q_g	$V_{DS}=30V, I_D=40A,$ $V_{GS}=10V$		106		nC
Gate-Source Charge	Q_{gs}			20		nC
Gate-Drain Charge	Q_{gd}			35		nC
Switching times						
Turn-on Delay Time	$t_{d(on)}$	$V_{DD}=30V, I_D=1A, R_L=30\Omega$		34	50	nS
Turn-on Rise Time	t_r			30	46	nS
Turn-Off Delay Time	$t_{d(off)}$	$V_{GS}=10V, R_G=2\Omega$		124	200	nS
Turn-Off Fall Time	t_f			64	116	nS
Source- Drain Diode Characteristics						
Source-drain current(Body Diode)	I_{SD}				40	A
Forward on voltage(Note 3)	V_{SD}	$T_j=25^{\circ}C, I_{SD}=20A, V_{GS}=0V$		0.8	1.3	V
Reverse Recovery Time(Note 1)	t_{rr}	$T_j=25^{\circ}C, I_F=40A, di/dt=100A/\mu s$		74		nS
Reverse Recovery Charge	Q_{rr}			140		nC
Forward Turn-on Time	t_{on}	Intrinsic turn-on time is negligible(turn-on is dominated by L_S+L_D)				

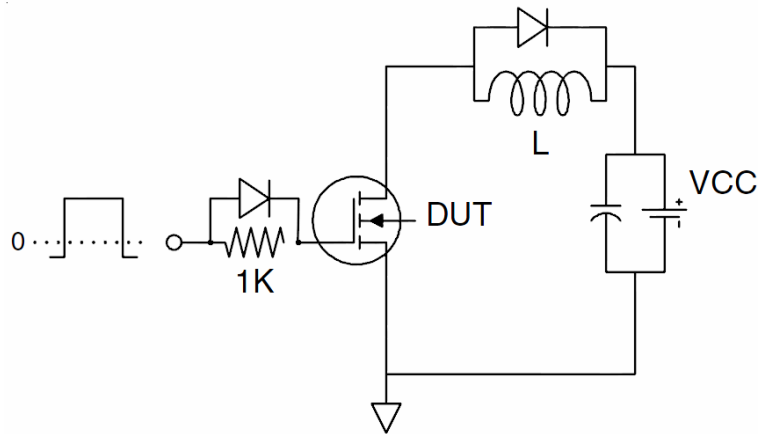
Notes 3. Pulse Test: Pulse Width $\leq 300\mu s$, Duty Cycle $\leq 2\%$, $R_G=25\Omega$, Starting $T_j=25^{\circ}C$

Test circuit

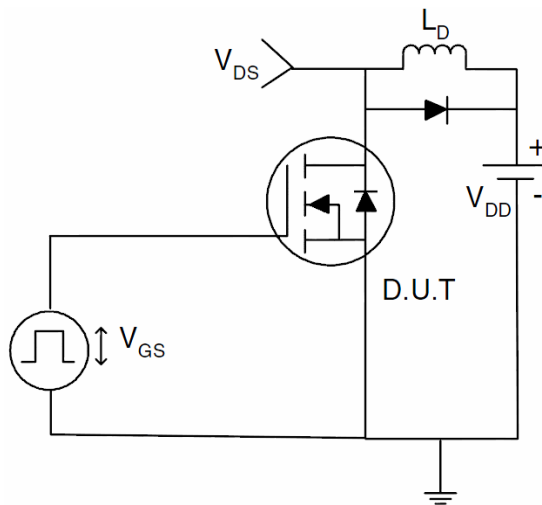
1) E_{AS} test Circuits



2) Gate charge test Circuit:

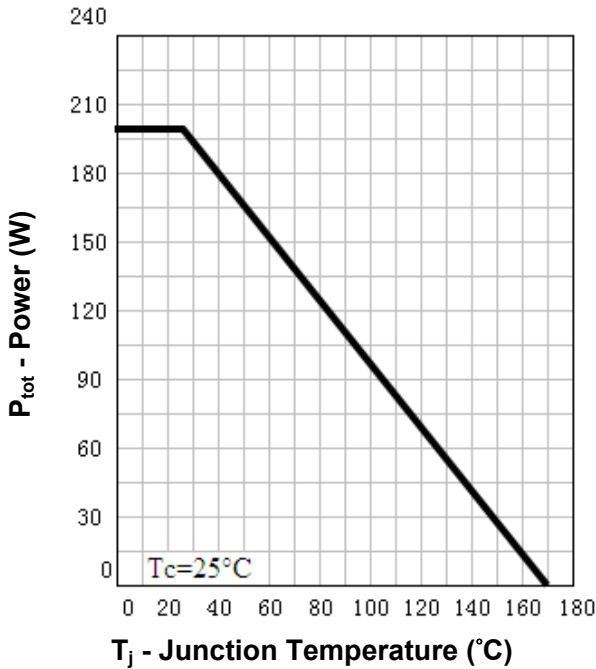


3) Switch Time Test Circuit:

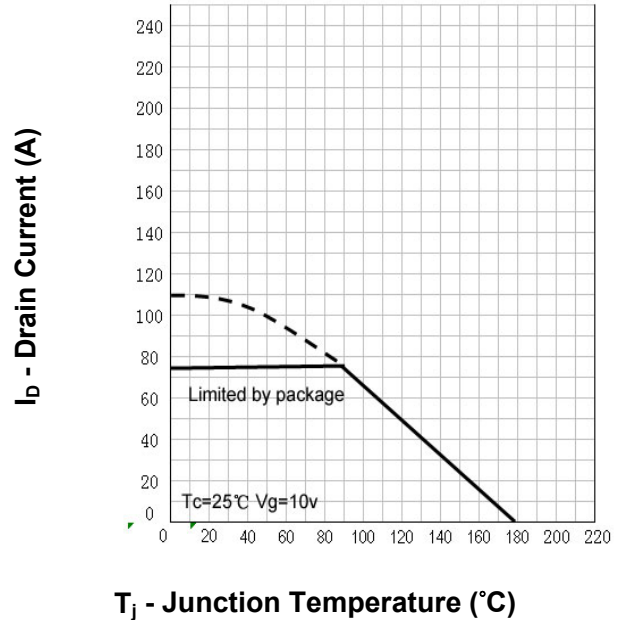


Typical Characteristics

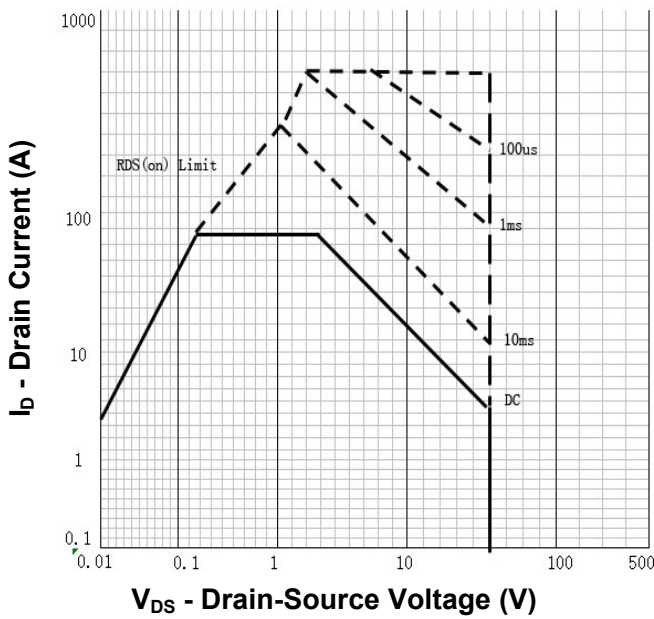
Power Dissipation



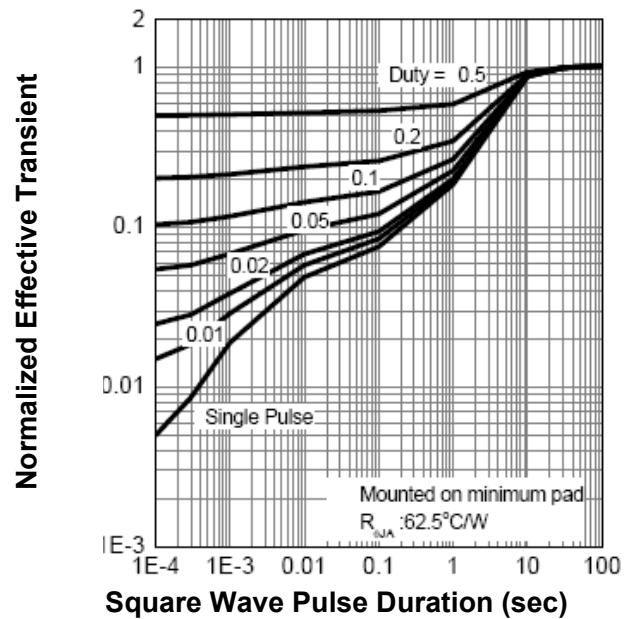
Drain Current



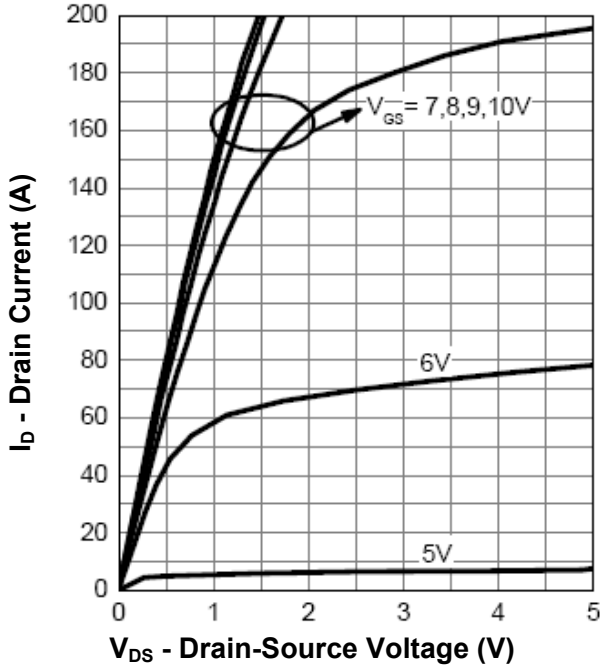
Safe Operation Area



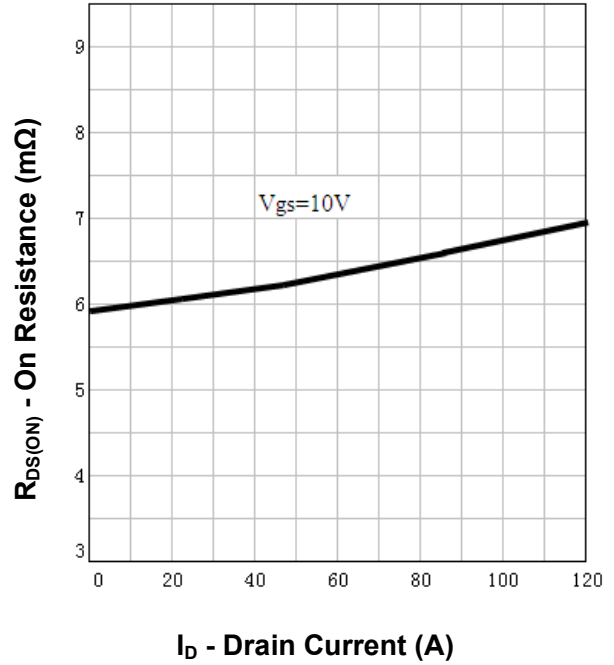
Thermal Transient Impedance



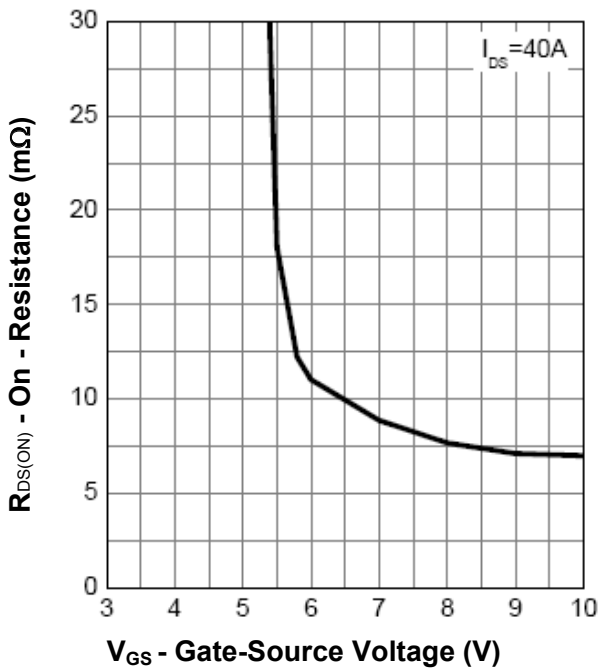
Output Characteristics



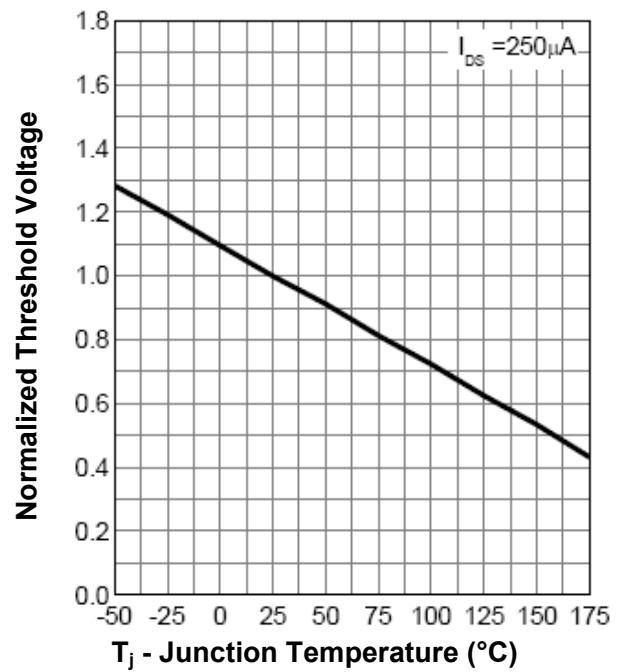
Drain-Source On Resistance



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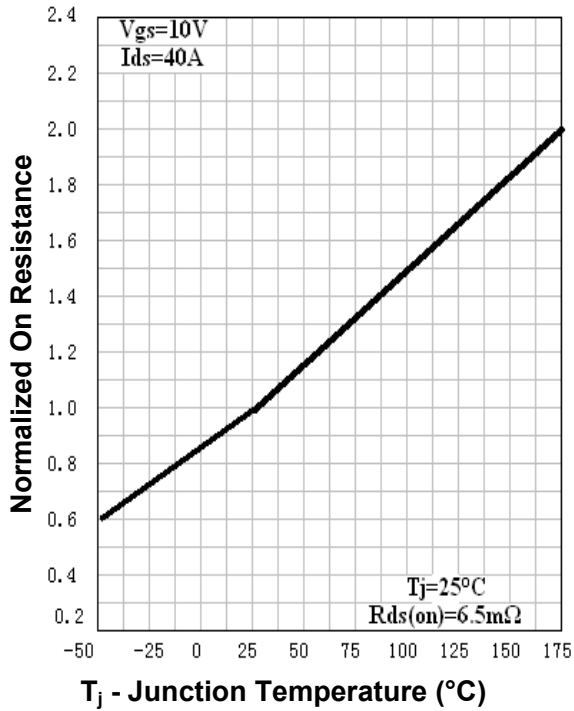


Gate Threshold Voltage

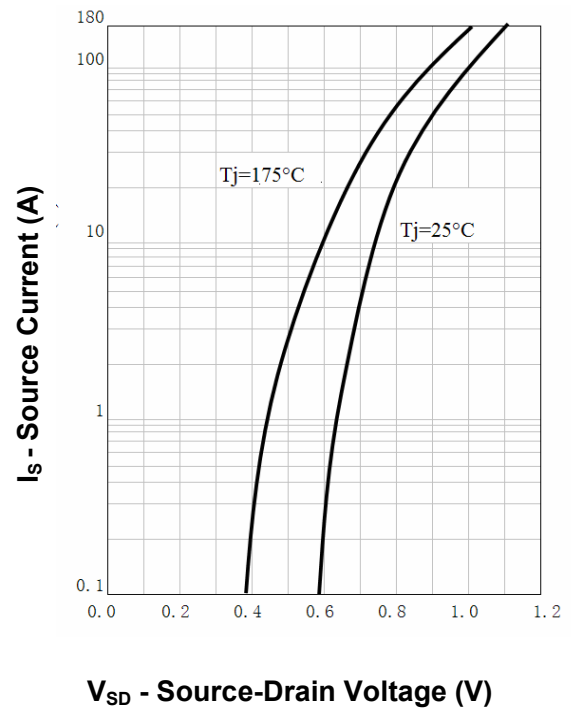


Typical Characteristics

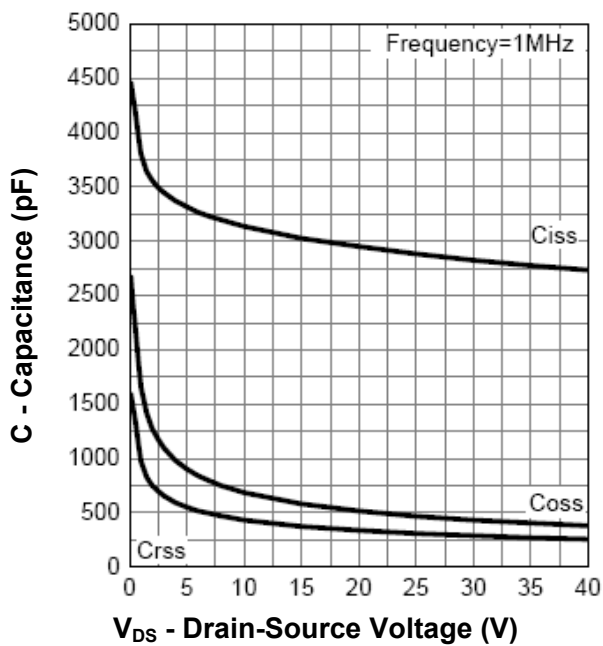
Drain-Source On Resistance



Source-Drain Diode Forward



Capacitance



Gate Charge

