HOMSEMI SEMICONDUCTOR

HS830DD

N-channel MOSFET

1. Description

The HS830DD N-Channel enhancement mode silicon gate power MOSFET is designed for high voltage, high speed power switching applications such as switching regulators, switching converters, solenoid, motor drivers, relay drivers.

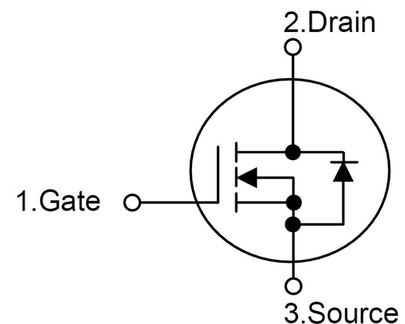
2. Features

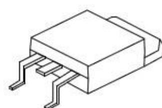
$R_{DS(ON)}$=1.6Ω(typical)
Low gate charge (typical 12nC)
High ruggedness
Fast switching capability
Avalanche energy specified
Improved dv/dt capability

V_{DS}	500	V
$R_{DS(on)}$TY	1.6	Ω
I_D	4	A

3. Pin configuration

Package	Order Number
TO-252	HS830DD





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4. Absolute maximum ratings

(T_C= 25ºC, unless otherwise noted)

Parameter		Symbol	Rating	Units
Drain-source voltage		V_{DSS}	500	V
Gate-source voltage		V_{GSS}	±30	V
Drain current continuous	T_C=25ºC	I_D	4.0	A
	T_C=100ºC		2.4	A
Drain current pulsed (note1)		I_{DP}	16	A
Avalanche Enlsed	Repetitive (note1)	E_{AR}	8.5	mJ
	Single pulse (note2)	E_{AS}	180	mJ
Peak diode recovery dv/dt (note3)		dv/dt	4.5	V/ns
Total power dissipation	T_C=25ºC	P_D	40	W
	Derate above 25ºC		0.3	W/ºC
Junction temperature		T_J	+150	ºC
Storage temperature		T_{STG}	-50~+150	ºC

*Drain current limited by maximum junction temperature.

5. Thermal characteristics

Parameter	Symbol	Rating	Unit
Thermal resistance,Junction-amient	R_{hJA}	110	ºC/W
Thermal resistance,case-to-sink typ.	R_{thCS}	0.7	ºC/W
Thermal resistance,Junction-case	R_{thJC}	1.4	ºC/W

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6. Electrical characteristics

(T_C= 25 ºC, unless otherwise noted)

Parameter		Symbol	Test conditions	Min	Typ	Max	Unit
Off characteristics							
Drain-source breakdown voltage		BV_{DSS}	V_{GS}=0V,I_D=250μA	500	-	-	V
Zero gate voltage drain current		I_{DSS}	V_{DS}=500V, V_{GS}=0V	-	-	1	μA
			V_{DS}=400V, T_C=125ºC	-	-	10	μA
Gate-body leakage current	Forward	I_{GSS}	V_{GS}=30V, V_{DS}=0V	-	-	100	nA
	Reverse		V_{GS}=-30V,V_{DS}=0V	-	-	-100	nA
Breakdown voltage temperature coefficient		$\triangle BV_{DSS}/\triangle T_J$	I_D=250μA	-	0.7	-	V/ ºC
On characteristics							
Gate threshold voltage		$V_{GS(TH)}$	V_{DS}= V_{GS} I_D=250μA	2.0	-	4.0	V
Static drain-source on- resistance		$R_{DS(ON)}$	V_{DS}=10V,I_D=2.0A	-	1.6	2.2	Ω
Dynamic characteristics							
Input capacitance		C_{ISS}	V_{DS}=25V,V_{GS}=0V, f=1MHz	-	500	-	pF
Output capacitance		C_{OSS}		-	50	-	pF
Reverse transfer capacitance		C_{RSS}		-	6	-	pF
Switching characteristics							
Turn-on delay time		$t_{D(ON)}$	V_{DD}=300V,I_D=4.0A, R_G=25Ω (note4,5)	-	10	-	ns
Rise time		t_R		-	35	-	ns
Turn-off delay time		$t_{D(OFF)}$		-	35	-	ns
Fall time		t_F		-	40	-	ns
Total gate charge		Q_G	V_{DS}=400V,I_D=4.0A V_{GS}=10V (note4,5)	-	12	-	nC
Gate-source charge		Q_{GS}		-	2.2	-	nC
Gate-drain charge		Q_{GD}		-	5.5	-	nC
Drain-source diode characteristics							
drain-source diode forward voltage		V_{SD}	V_{GS}=0V,I_{SD}=4.0A	-	-	1.4	V
Continuous drain-source current		I_{SD}		-	-	4.0	A
Pulsed drain-source current		I_{SM}				16	A
Reverse recovery time		t_{RR}	I_{SD}=4.0A dI$_{SD}$/dt=100A/μs (note4)		280	-	ns
Reverse recovery charge		Q_{RR}			2.0	-	μC

Notes:1.repetitive rating:pulse width limited by maximum junction temperature

2.L=18.9mH,I_{AS}=4.0A,V_{DD}=50V,R_G=25Ω,starting T_J=25ºC

3.I_{SD}≤4.0A,di/dt≤200A/μs,V_{DD}≤BV_{DSS},starting T_J=25ºC

4.Pulse test:pulse width≤300μs,duty cycle≤2%

5.Essentially independent of operating temperature

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