HS7N60

N-channel MOSFET

1. Description

The HS7N60 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.

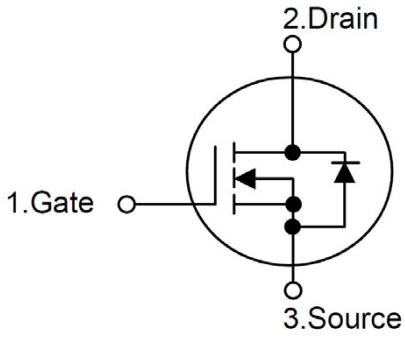
2. Feature

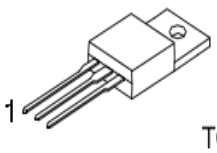
- $R_{DS(ON)}$ MAX =1.2Ω@V_{GS}=10 V
- Low gate charge (typical 28nC)
- Fast switching capability
- Avalanche energy specified
- Improved dv/dt capability

V_{DS}	600	V
$R_{DS(ON)}$	1.2	Ω
I_D	7	A

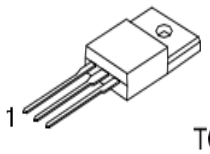
3. Pin configuration

Package	Order Number
TO-220F	HS7N60FA
TO-220	HS7N60PA





TO-220



TO-220F

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4. Absolute maximum ratings (TC= 25 ºC, unless otherwise specified)

Parameter		Symbol	Ratings	Units
Drain-source voltage		V_{DSS}	600	V
Gate-source voltage		V_{GSS}	±30	V
Drain currenet continuous	T_c =25°C	I_D	7.0	A
	T_c =100°C		5.1	A
Drain current pulsed (note1)		I_{DP}	29	A
Avalanche energy	Repetitive (note1)	E_{AR}	27.9	mJ
	Single pulse (note2)	E_{AS}	270	mJ
Peak diode recovery dv/dt (note3)		dv/dt	4.5	V/ns
Total power dissipation	T_c=25°C	P_D	145	W
	Derate above 25°C		1.15	W/°C
Junction temperature		T_J	+150	°C
Storage temperature		T_{STG}	-55~+150	°C

5. Thermal characteristics (note6)

Parameter	Symbol	Ratings		Units
		TO-220	TO-220F	
Thermal resistance junction-ambient	R_{thJA}	62.5		°C/W
Thermal resistance, case-to-sink typ	R_{thCS}	0.7	--	
Thermal resistance junction-case	R_{thJC}	1.2	2.7	

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	600	-	-	V
Zero gate voltage drain current		I_{DSS}	V_{DS}=600V, V_{GS}=0V	-	-	1	μA
			V_{DS}=480V, 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= 3.5 A	-	1.0	1.2	Ω
Dynamic characteristics							
Input capacitance		C_{ISS}	V_{DS}=25V,V_{GS}=0V, f=1MHz	-	980	-	pF
Output capacitance		C_{OSS}		-	105	-	pF
Reverse transfer capacitance		C_{RSS}		-	5	-	pF
Switching characteristics							
Turn-on delay time		$t_{D(ON)}$	V_{DD}=300V,I_D= 7.0A, 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}=480V,I_D= 7.0A V_{GS}=10V (note4,5)	-	35	-	nC
Gate-source charge		Q_{GS}		-	5.5.	-	nC
Gate-drain charge		Q_{GD}		-	20	-	nC
Drain-source diode characteristics							
drain-source diode forward voltage		V_{SD}	V_{GS}=0V,I_{SD}= 7.0A	-	-	1.4	V
Continuous drain-source current		I_{SD}		-	-	7.0	A
Pulsed drain-source current		I_{SM}		-	-	28	A
Reverse recovery time		t_{RR}	I_{SD}= 7.0A dI_{SD}/dt=100A/μs (note4)	-	270	-	ns
Reverse recovery charge		Q_{RR}		-	2.3	-	μC

Note ： 1. Repetitive rating : pulse width limited by maximum junction temperature

2. L=25mH,I_{AS} = 7.0 A ,V_{DD} =50V, R_G = 25 Ω , starting T_J =25°C

3. I_{SD}≤ 7.0A,di/dt ≤ 200A/ μ s, V_{DD} ≤ BV_{DSS} , starting T_J =25°C

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

5. Essentially independent of operating temperature

6. Thermal characteristics are reported for the TO-220 package