HMB**150N15**

Silicon N-Channel Power MOSFET

General Description:

The HMB150N15 uses advanced trench technology and design to provide excellent $R_{DS(ON)}$ with low gate charge. It can be used in a wide variety of applications. The package form is TO-220, which accords with the RoHS standard.

| V_{DSS}	150	V
I_D	150	A
P_D	320	W
$R_{DS(ON)type}$	5.5	mΩ
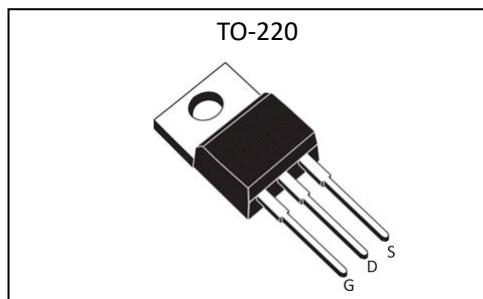
Features:

- $R_{DS(ON)}$ <6.5mΩ @ V_{GS}=10V (Typ5.5mΩ)
- High density cell design for ultra low R_{dson}
- Fully characterized avalanche voltage and current
- Excellent package for good heat dissipation

TO-220
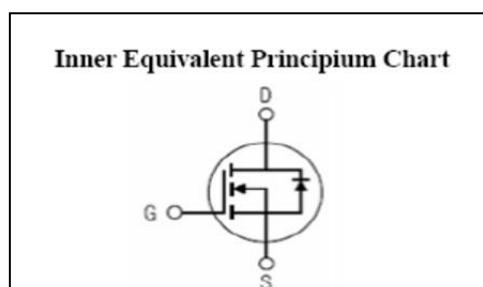
Applications:

- Power switching application
- Hard switched and high frequency circuits
- Uninterruptible power supply

Inner Equivalent Principium Chart

Absolute (Tc= 25℃ unless otherwise specified):

Symbol	Parameter	Rating	Units
V_{DSS}	Drain-to-Source Voltage	150	V
I_D	Continuous Drain Current	150	A
I_{DM}	Pulsed Drain Current	450	A
V_{GS}	Gate-to-Source Voltage	±20	V
P_D	Power Dissipation	370	W
E_{AS}	Single pulse avalanche energy[a5]	1600	mJ
T_J, T_{stg}	Operating Junction and Storage Temperature Range	175, −55 to 175	℃

Electrical Characteristics (Tc= 25℃ unless otherwise specified)：

OFF Characteristics

Symbol	Parameter	Test Conditions	Rating			Units
			Min.	Typ.	Max.	
V_{DSS}	Drain to Source Breakdown Voltage	$V_{GS}=0V, I_D=250\mu A$	150	--	--	V
I_{DSS}	Drain to Source Leakage Current	$V_{DS}=150V, V_{GS}=0V, T_a=25℃$	--	--	1.0	μA
$I_{GSS(F)}$	Gate to Source Forward Leakage	$V_{GS}=+20V$	--	--	0.1	μA
$I_{GSS(R)}$	Gate to Source Reverse Leakage	$V_{GS}=-20V$	--	--	-0.1	μA

ON Characteristics[a3]

Symbol	Parameter	Test Conditions	Rating			Units
			Min.	Typ.	Max.	
$R_{DS(ON)}$	Drain-to-Source On-Resistance	$V_{GS}=10V, I_D=75A$	--	5.5	6.5	mΩ
$V_{GS(TH)}$	Gate Threshold Voltage	$V_{DS}=V_{GS}, I_D=250\mu A$	2.0	--	5.0	V

Pulse width tp≤380μs,δ≤2%

Dynamic Characteristics[a4]

Symbol	Parameter	Test Conditions	Rating			Units
			Min.	Typ.	Max.	
g_{fs}	Forward Transconductance	$V_{DS}=25V, I_D=75A$	65	--	--	S
C_{iss}	Input Capacitance	$V_{GS}=0V, V_{DS}=25V$ f=1.0MHz	--	6000	--	pF
C_{oss}	Output Capacitance		--	650	--	
C_{rss}	Reverse Transfer Capacitance		--	10	--	

Resistive Switching Characteristics[a4]

Symbol	Parameter	Test Conditions	Rating			Units
			Min.	Typ.	Max.	
$t_{d(ON)}$	Turn-on Delay Time	$V_{DD}=75V, I_D=75A, R_L=15\Omega$ $V_{GS}=10V, R_G=4.7\Omega$	--	26	--	ns
tr	Rise Time		--	36	--	
$t_{d(OFF)}$	Turn-Off Delay Time		--	48	--	
t_f	Fall Time		--	16	--	
Q_g	Total Gate Charge	$V_{DD}=75V, I_D=75A$ $V_{GS}=10V$	--	80	--	nC
Q_{gs}	Gate to Source Charge		--	33	--	
Q_{gd}	Gate to Drain（"Miller"）Charge		13	39	--	

Source-Drain Diode Characteristics

Symbol	Parameter	Test Conditions	Rating			Units
			Min.	Typ.	Max.	
I_{SD}	Continuous Source Current (Body Diode)		--	--	150	A
I_{SM}	Maximum Pulsed Current (Body Diode)		--	--	450	A
V_{SD}	Diode Forward Voltage	$I_S=150A, V_{GS}=0V$	--	--	1.2	V
t_{rr}	Reverse Recovery Time	$I_S=150A, T_j=25℃$	--	180	--	ns
Q_{rr}	Reverse Recovery Charge	$dI_F/dt=100A/\mu s, V_{GS}=0V$	--	530	--	nC

Symbol	Parameter	Typ.	Units
$R_{\theta JC}$	Junction-to-Case[a2]	0.47	℃/W

[a1]: Repetitive Rating: Pulse width limited by maximum junction temperature.

[a2]: Surface Mounted on FR4 Board, t≤10sec.

[a3]: Pulse Test: Pulse Width≤300μs, Duty Cycle≤2%.

[a4]: Guaranteed by design, not subject to production

[a5]: EAS condition: Tj=25℃,V_{DD}=40V,V_G=10V,L=0.5mH,Rg=25Ω

Test circurt

**1) EAS test Circuit**
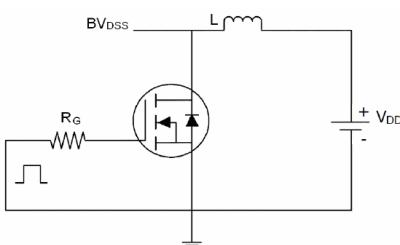
2) Gate charge test Circuit
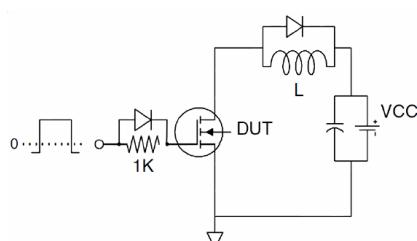
3) Switch Time Test Circuit
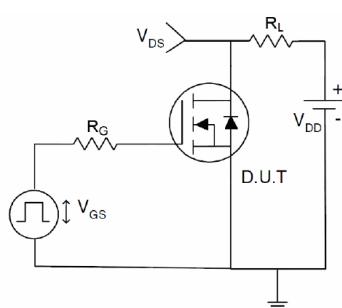
Characteristics Curve：
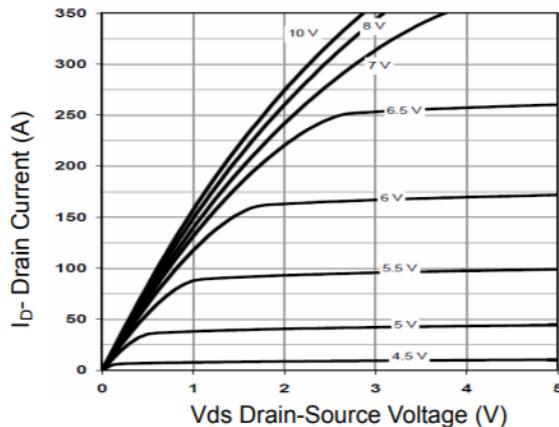
Figure 1 Output Characteristics

Figure 4 Rdson-JunctionTemperature

Figure 2 Transfer Characteristics
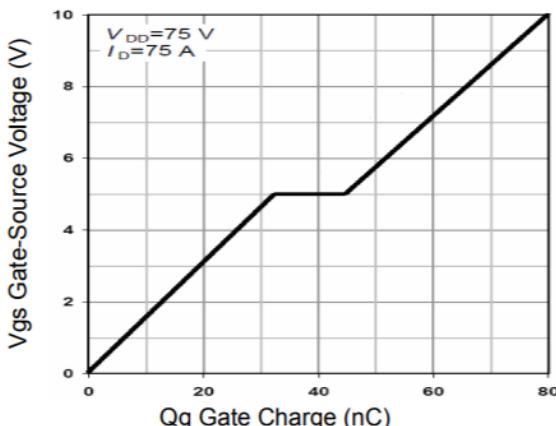
Figure 5 Gate Charge

Figure 3 Rdson- Drain Current
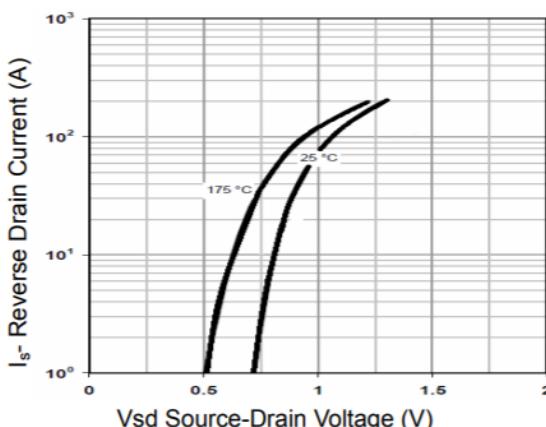

**Figure 6 Source- Drain Diode Forward**
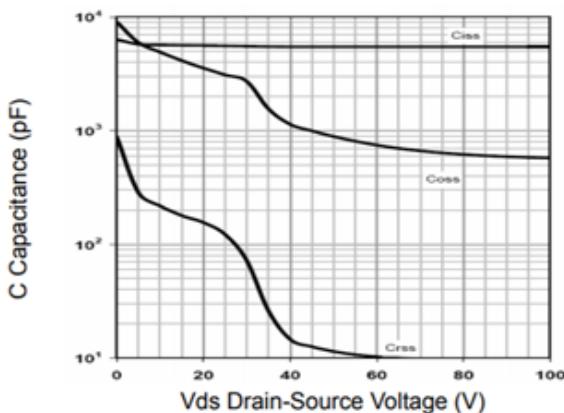
**Figure 7 Capacitance vs Vds**
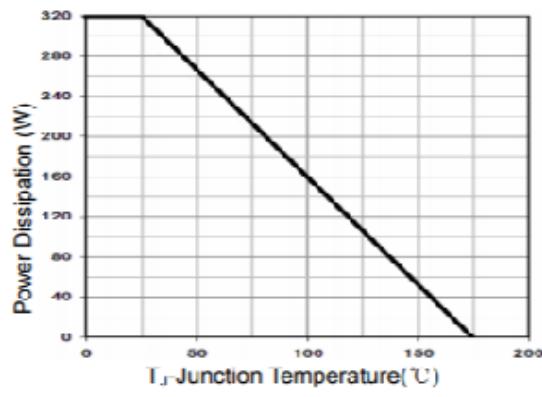
Figure 9 Power De-rating
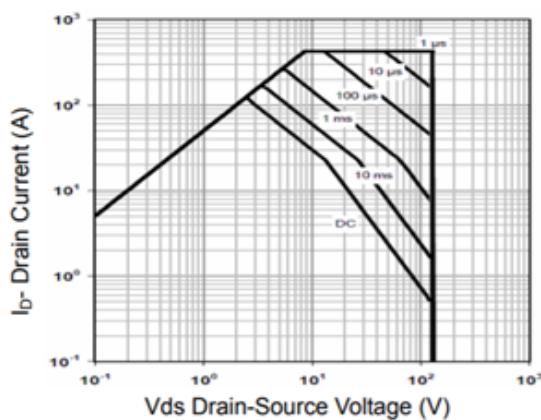
Figure 8 Safe Operation Area
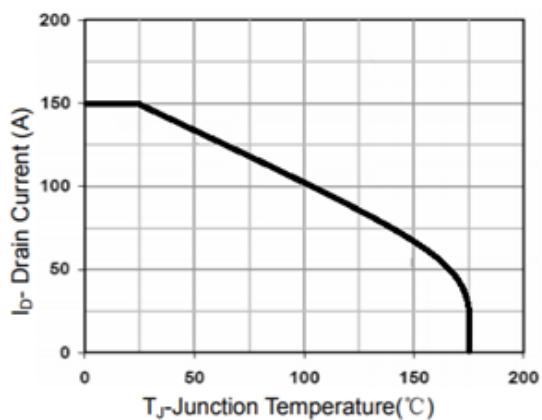
Figure 10 Current De-rating
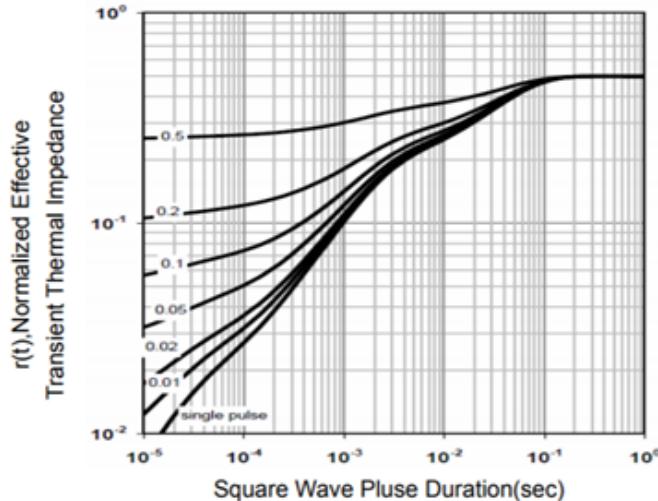
Figure 11 Normalized Maximum Transient Thermal Impedance