



HMPP009R100

General Description:

The HMPP009R100 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-247, which accords with the RoHS standard.

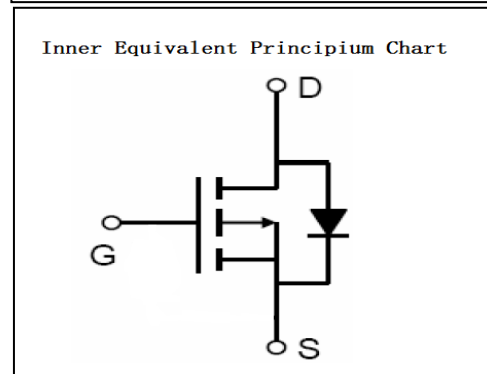
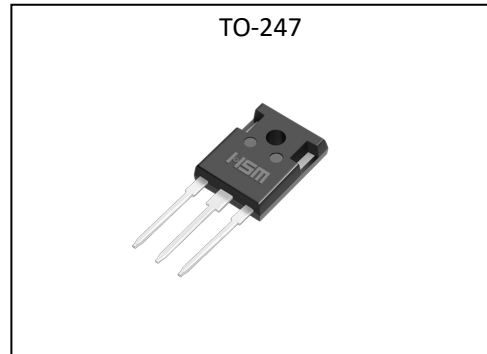
Features >

- $R_{DS(ON)} < 12m\Omega$ @ $V_{GS}=10V$ (Typ $9m\Omega$)
- High density cell design for ultra low R_{dson}
- Fully characterized avalanche voltage and current
- Excellent package for good heat dissipation

Applications:

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

V_{DSS}	-100	V
I_D	-140	A
P_D	560	W
$R_{DS(ON)type}$	9	$m\Omega$



Absolute (Tc= 25°C unless otherwise specified):

Symbol	Parameter	Rating	Units
V_{DSS}	Drain-to-Source Voltage	-100	V
I_D	Continuous Drain Current	-140	A
I_{DM}	Pulsed Drain Current	-400	A
V_{GS}	Gate-to-Source Voltage	± 20	V
P_D	Power Dissipation	560	W
E_{AS}	Single pulse avalanche energy ^{a5}	2000	mJ
T_J, T_{stg}	Operating Junction and Storage Temperature Range	150, -55 to 150	°C



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Electrical Characteristics ($T_c = 25^\circ\text{C}$ unless otherwise specified) :

OFF Characteristics						
Symbol	Parameter	Test Conditions	Rating			Units
			Min.	Typ.	Max.	
V_{DSS}	Drain to Source Breakdown Voltage	$V_{GS}=0V, I_D=250\mu A$	-100	--	--	V
I_{DSS}	Drain to Source Leakage Current	$V_{DS}=-100V, V_{GS}=0V, T_a=25^\circ\text{C}$	--	--	5	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	$V_{GS}=-10V, I_D=-70A$	--	9	12	$m\Omega$
$V_{GS(TH)}$	Gate Threshold Voltage	$V_{DS}=V_{GS}, I_D=-250\mu A$	-2	--	-4	V

Pulse width $t_p \leq 380\mu s, \delta \leq 2\%$

Dynamic Characteristics ^{a4}						
Symbol	Parameter	Test Conditions	Rating			Units
			Min.	Typ.	Max.	
g_{fs}	Forward Transconductance	$V_{DS}=-15V, I_D=-70A$	70	--	--	S
C_{iss}	Input Capacitance	$V_{GS}=0V, V_{DS}=-25V$ $f=1.0\text{MHz}$	--	18000	--	pF
C_{oss}	Output Capacitance		--	3500	--	
C_{rss}	Reverse Transfer Capacitance		--	800	--	

Resistive Switching Characteristics ^{a4}						
Symbol	Parameter	Test Conditions	Rating			Units
			Min.	Typ.	Max.	
$t_{d(ON)}$	Turn-on Delay Time	$V_{DD}=-50V, I_D=-70A$ $V_{GS}=-10V, R_G=1\Omega$	--	50	--	ns
t_r	Rise Time		--	32	--	
$t_{d(OFF)}$	Turn-Off Delay Time		--	88	--	
t_f	Fall Time		--	34	--	
Q_g	Total Gate Charge	$V_{DD}=-50V, I_D=-50A$ $V_{GS}=-10V$	--	380	--	nC
Q_{gs}	Gate to Source Charge		--	120	--	
Q_{gd}	Gate to Drain ("Miller")Charge		--	89	--	

Source-Drain Diode Characteristics

Symbol	Parameter	Test Conditions	Rating			Units
			Min.	Typ.	Max.	
I_S	Continuous Source Current ^{a2} (Body Diode)		--	--	-140	A
V_{SD}	Diode Forward Voltage ^{a3}	$I_S = -140A, V_{GS} = 0V$	--	--	-1.5	V

Symbol	Parameter	Typ.	Units
$R_{\theta JC}$	Junction-to-Case ^{a2}	0.22	°C/W

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

a²: Surface Mounted on FR4 Board, $t \leq 10\text{sec}$.

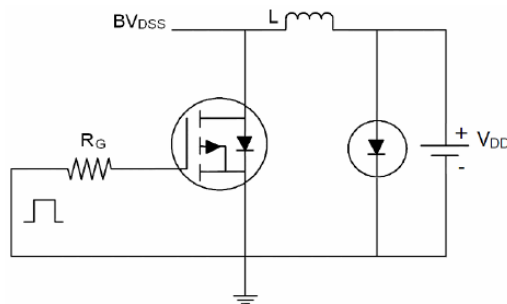
a³: Pulse Test: Pulse Width $\leq 300\mu\text{s}$, Duty Cycle $\leq 2\%$.

a⁴: Guaranteed by design, not subject to production

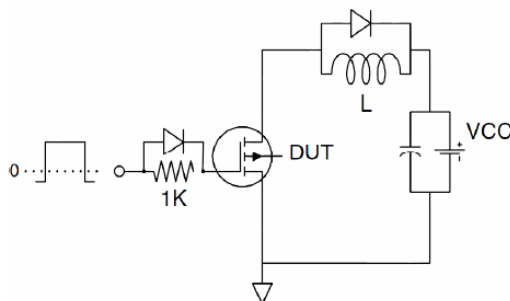
a⁵: EAS condition: $T_j = 25^\circ\text{C}, V_{DD} = -50V, V_G = -10V, L = 0.5\text{mH}, R_g = 25\Omega$

Test circuit:

1) EAS Test Circuit



2) Gate Charge Test Circuit



3) Switch Time Test Circuit

