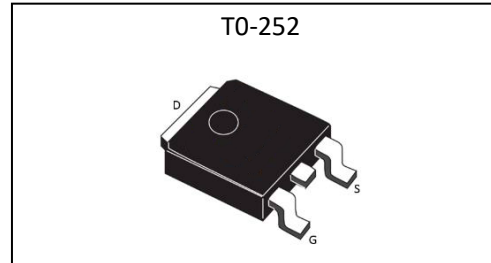


Silicon N-Channel Power MOSFET

General Description:

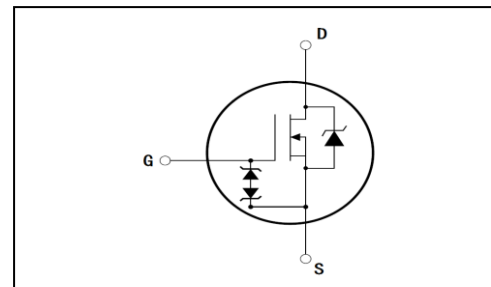
HMR501B the silicon N-channel Depletion mode MOSFETS, is obtained by the self-aligned planar Technology which reduce the conduction loss, improve switching performance and enhance the avalanche energy. The package form is TO-252, which accords with the RoHS and Halogen Free standard.

V_{DSX}	600	V
$I_{DSS\ MIN}$	24	mA
$R_{DS(ON)MAX}$	300	Ω



Features:

- N-Channel
- ESD improved Capability
- Depletion Mode
- dv/dt rated
- Pb-free lead plating;ROHS compliant
- Halogen Free



Absolute (Tc= 25°C unless otherwise specified)

Symbol	Parameter	Rating	Units
V_{DSX}	Drain-to-Source Voltage	600	V
I_D	Continuous Drain Current	0.060	A
	Continuous Drain Current $T_C = 70^\circ C$	0.048	A
I_{DM}^{a1}	Pulsed Drain Current	0.240	A
V_{GS}	Gate-to-Source Voltage	± 20	V
d_v/d_t^{a2}	Peak Diode Recovery dv/dt	5.0	V/ns
P_D	Power Dissipation	25	W
$V_{ESD(G-S)}$	Gate source ESD (HBM-C= 100pF, R=1.5k Ω)	300	V
T_J, T_{stg}	Operating Junction and Storage Temperature Range	150, -55 to 150	$^\circ C$
T_L	Maximum Temperature for Soldering	300	$^\circ C$

Electrical Characteristics (Tc= 25°C unless otherwise specified)

OFF Characteristics						
Symbol	Parameter	Test Conditions	Rating			Units
			Min.	Typ.	Max.	
V _{DSX}	Drain to Source Breakdown Voltage	V _{GS} =-5V, I _D =250μA	600	--	--	V
I _{D(off)}	Off-state Drain to Source Current	V _{DS} =600V, V _{GS} =-5V	--	--	0.1	μA
		V _{DS} =480V, V _{GS} =-5V, Ta=125°C	--	--	10	μA
I _{GSS(F)}	Gate to Source Forward Leakage	V _{GS} =+20V	--	--	10	μA
I _{GSS(R)}	Gate to Source Reverse Leakage	V _{GS} =-20V	--	--	-10	μA

ON Characteristics						
Symbol	Parameter	Test Conditions	Rating			Units
			Min.	Typ.	Max.	
I _{dss}	On-state drain current	V _{GS} =0V, V _{DS} =25V	24	--	--	mA
R _{DS(ON)}	Drain-to-Source On-Resistance	V _{GS} =0V, I _D =3mA	--	150	300	Ω
		V _{GS} =10V, I _D =16mA	--	400	800	
V _{GS(TH)}	Gate Threshold Voltage	V _{DS} =3V, I _D =8.0μA	-2.7	-1.8	-1.0	V

Dynamic Characteristics						
Symbol	Parameter	Test Conditions	Rating			Units
			Min.	Typ.	Max.	
g _{fs}	Forward Transconductance	V _{DS} =50V, I _D =0.01A	0.02	0.03	--	S
C _{iss}	Input Capacitance	V _{GS} =-5V, V _{DS} =25V f=1.0MHz	--	100	--	pF
C _{oss}	Output Capacitance		--	9	--	
C _{rss}	Reverse Transfer Capacitance		--	2.13	--	

Resistive Switching Characteristics						
Symbol	Parameter	Test Conditions	Rating			Units
			Min.	Typ.	Max.	
t _{d(ON)}	Turn-on Delay Time	I _D =0.01A, V _{DD} =300V V _{GS} =-5...7V R _G =6.0Ω	--	20	--	ns
t _r	Rise Time		--	100.2	--	
t _{d(OFF)}	Turn-Off Delay Time		--	111	--	
t _f	Fall Time		--	250	--	
Q _g	Total Gate Charge	I _D =0.01A, V _{DD} =400V V _{GS} =-5V to 5V	--	2.24	--	nC
Q _{gs}	Gate to Source Charge		--	1	--	
Q _{gd}	Gate to Drain ("Miller") Charge		--	0.65	--	

Source-Drain Diode Characteristics						
Symbol	Parameter	Test Conditions	Rating			Units
			Min.	Typ.	Max.	
I_S	Continuous Source Current (Body Diode)	$T_a = 25^\circ\text{C}$	--	--	0.05	A
I_{SM}	Maximum Pulsed Current (Body Diode)		--	--	0.2	A
V_{SD}	Diode Forward Voltage	$I_F = 32\text{mA}, V_{GS} = -5\text{V}$	--	--	1.2	V
t_{rr}	Reverse Recovery Time	$I_F = 0.02\text{A}, T_J = 25^\circ\text{C}$	--	320	--	ns
Q_{rr}	Reverse Recovery Charge	$dI_F/dt = 100\text{A}/\mu\text{s}, V_R = 300\text{V}$	--	760	--	nC

Symbol	Parameter	Typ.	Units
$R_{\theta JA}$	Junction-to-Ambient	62.5	$^\circ\text{C}/\text{W}$

Gate-source Zener diode						
Symbol	Parameter	Test Conditions	Rating			Units
			Min.	Typ.	Max.	
V_{GSO}	Gate-source breakdown voltage	$I_{GS} = \pm 1\text{mA}(\text{Open Drain})$	20	--	--	V
<p>The built-in back-to-back Zener diodes have specifically been designed to enhance not only the device' s ESD capability, but also to make them safely absorb possible voltage transients that may occasionally be applied from gate to source. In this respect the Zener voltage is appropriate to achieve an efficient and cost-effective intervention to protect the device' s integrity. These integrated Zener diodes thus avoid the usage of external components.</p>						