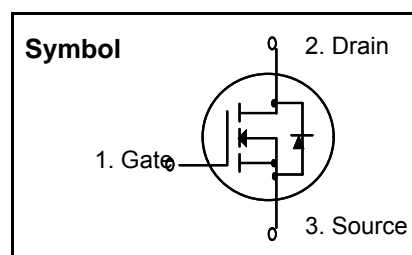


N-Channel MOSFET

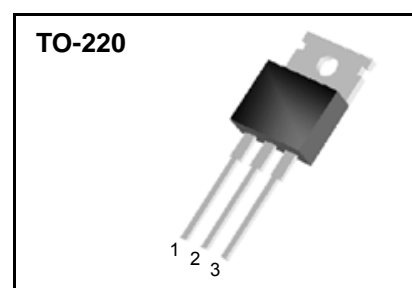
Features

- $R_{DS(on)}$ (Max 0.55 Ω)@ $V_{GS}=10V$
- Gate Charge (Typical 38nC)
- Improved dv/dt Capability, High Ruggedness
- 100% Avalanche Tested
- Maximum Junction Temperature Range (150°C)



General Description

This Power MOSFET is produced using Integral's advanced planar stripe, DMOS technology. This latest technology has been especially designed to minimize on-state resistance, have a high rugged avalanche characteristics. These devices are well suited for high efficiency switching DC/DC converters, switch mode power supply, DC-AC converters for uninterrupted power supply, motor control.



Absolute Maximum Ratings

Symbol	Parameter	Value	Units
V_{DSS}	Drain to Source Voltage	400	V
I_D	Continuous Drain Current(@ $T_C = 25^\circ C$)	10	A
	Continuous Drain Current(@ $T_C = 100^\circ C$)	6.3	A
I_{DM}	Drain Current Pulsed (Note 1)	40	A
V_{GS}	Gate to Source Voltage	± 25	V
E_{AS}	Single Pulsed Avalanche Energy (Note 2)	450	mJ
E_{AR}	Repetitive Avalanche Energy (Note 1)	13.4	mJ
dv/dt	Peak Diode Recovery dv/dt (Note 3)	5.5	V/ns
P_D	Total Power Dissipation(@ $T_C = 25^\circ C$)	134	W
	Derating Factor above 25 °C	1.08	W/°C
T_{STG}, T_J	Operating Junction Temperature & Storage Temperature	- 55 ~ 150	°C
T_L	Maximum Lead Temperature for soldering purpose, 1/8 from Case for 5 seconds.	300	°C

Thermal Characteristics

Symbol	Parameter	Value			Units
		Min.	Typ.	Max.	
$R_{\theta JC}$	Thermal Resistance, Junction-to-Case	-	-	0.93	°C/W
$R_{\theta CS}$	Thermal Resistance, Case to Sink	-	0.5	-	°C/W
$R_{\theta JA}$	Thermal Resistance, Junction-to-Ambient	-	-	62.5	°C/W

Electrical Characteristics

$T_C = 25^\circ\text{C}$ unless otherwise noted

Symbol	Parameter	Test Conditions	Min	Typ	Max	Units
BV_{DSS}	Drain-Source Breakdown Voltage	$V_{GS} = 0\text{ V}, I_D = 250\ \mu\text{A}$	400	--	--	V
$\Delta BV_{DSS} / \Delta T_J$	Breakdown Voltage Temperature Coefficient	$I_D = 250\ \mu\text{A}$, Referenced to 25°C	--	0.50	--	$\text{V}/^\circ\text{C}$
I_{DSS}	Zero Gate Voltage Drain Current	$V_{DS} = 400\text{ V}, V_{GS} = 0\text{ V}$	--	--	1	μA
		$V_{DS} = 320\text{ V}, T_C = 125^\circ\text{C}$	--	--	10	μA
I_{GSSF}	Gate-Body Leakage Current, Forward	$V_{GS} = 25\text{ V}, V_{DS} = 0\text{ V}$	--	--	100	nA
I_{GSSR}	Gate-Body Leakage Current, Reverse	$V_{GS} = -25\text{ V}, V_{DS} = 0\text{ V}$	--	--	-100	nA

On Characteristics

$V_{GS(th)}$	Gate Threshold Voltage	$V_{DS} = V_{GS}, I_D = 250\ \mu\text{A}$	2.0	--	4.0	V
$R_{DS(on)}$	Static Drain-Source On-Resistance	$V_{GS} = 10\text{ V}, I_D = 5.0\text{ A}$	--	0.44	0.55	Ω
g_{FS}	Forward Transconductance	$V_{DS} = 40\text{ V}, I_D = 5.0\text{ A}$ (Note 4)	--	9.0	--	S

Dynamic Characteristics

C_{iss}	Input Capacitance	$V_{DS} = 25\text{ V}, V_{GS} = 0\text{ V},$ $f = 1.0\text{ MHz}$	--	1570	2040	pF
C_{oss}	Output Capacitance		--	150	195	pF
C_{rss}	Reverse Transfer Capacitance		--	15	20	pF

Switching Characteristics

$t_{d(on)}$	Turn-On Delay Time	$V_{DD} = 200\text{ V}, I_D = 10.0\text{ A},$ $R_G = 25\ \Omega$	--	25	60	ns
t_r	Turn-On Rise Time		--	75	160	ns
$t_{d(off)}$	Turn-Off Delay Time		--	115	240	ns
t_f	Turn-Off Fall Time		(Note 4, 5)	--	70	150
Q_g	Total Gate Charge	$V_{DS} = 320\text{ V}, I_D = 10.0\text{ A},$ $V_{GS} = 10\text{ V}$	--	38	50	nC
Q_{gs}	Gate-Source Charge		--	8	--	nC
Q_{gd}	Gate-Drain Charge		(Note 4, 5)	--	13	--

Drain-Source Diode Characteristics and Maximum Ratings

I_S	Maximum Continuous Drain-Source Diode Forward Current	--	--	10	A	
I_{SM}	Maximum Pulsed Drain-Source Diode Forward Current	--	--	40	A	
V_{SD}	Drain-Source Diode Forward Voltage	$V_{GS} = 0\text{ V}, I_S = 10.0\text{ A}$	--	--	1.5	V
t_{rr}	Reverse Recovery Time	$V_{GS} = 0\text{ V}, I_S = 10.0\text{ A},$ $di_F / dt = 100\text{ A}/\mu\text{s}$ (Note 4)	--	225	--	ns
Q_{rr}	Reverse Recovery Charge		--	1.59	--	μC

Notes:

1. Repetitive Rating : Pulse width limited by maximum junction temperature
2. $L = 7.9\text{ mH}, I_{AS} = 10.0\text{ A}, V_{DD} = 50\text{ V}, R_G = 25\ \Omega$, Starting $T_J = 25^\circ\text{C}$
3. $I_{SD} \leq 10.0\text{ A}, di/dt \leq 300\ \mu\text{A}/\text{s}, V_{DD} \leq BV_{DSS}$, Starting $T_J = 25^\circ\text{C}$
4. Pulse Test : Pulse width $\leq 300\ \mu\text{s}$, Duty cycle $\leq 2\%$
5. Essentially independent of operating temperature