

MDT2N60

600V N-Channel Power MOSFET

Features

- (1) $R_{DS(ON)} < 4.4\Omega @ V_{GS} = 10V, I_D = 1A$
- 2 Fast switching capability
- ③ Lead free in compliance with EU RoHS directive.
- ④ Improved dv/dt capability, high ruggedness

Mechanical Data

① Case: TO-251,TO-252,TO-220F

Ordering Information

Part No.	Package	Packing
MDP2N60	TO-251	75pcs / Tube
MDT2N60	TO-252	2.5Kpcs / 13" Reel
MPF2N60	TO-220F	50pcs / Tube

PRODUCT SUMMARY

V _{DS} (V)	R _{DS(on)} (Ω)	Current
600	4.4 @ V _{GS} =10V	2A



ABSOLUTE MAXIMUM RATINGS (TC=25°C, unless otherwise specified)

PARA	METER	SYMBOL	RATINGS	UNIT
Drain-Source Voltage		V _{DSS}	600	V
Gate-Source Voltage		V _{GSS}	±30	V
Avalanche Current (N	ote 2)	I _{AR}	2.0	А
Continuous Drain Cur	rent	I _D	2.0	А
Pulsed Drain Current	(Note 2)	I _{DM}	8.0	А
Avalanche Energy	Single Pulsed (Note 3)	E _{AS}	115	mJ
	TO-220F		44	W
Power Dissipation	TO-251	PD	34	W
TO-252			34	W
Junction Temperature		٦	+150	°C
Operating Temperature		T _{OPR}	-55 ~ +150	°C
Storage Temperature		T _{STG}	-55 ~ +150	°C

 Notes: 1. Absolute maximum ratings are those values beyond which the device could be permanently damaged. Absolute maximum ratings are stress ratings only and functional device operation is not implied.
2.Repetitive Rating : Pulse width limited by maximum junction temperature
3.L = 30mH, I_{AS} = 2.7A, V_{DD} = 50V, R_G = 25 Ω, Starting T_J = 25°C

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THERMAL DATA

PARAN	IETER	SYMBOL	RATING	UNIT	
Junction to Ambient	TO-220F	θιΔ	62.5	°C/W	
	TO-251/ TO-252	57 (110		
	TO-220F		5.5		
Junction to Case	TO-252	θ_{JC}	2.9	°C/W	
	TO-251		2.9		

ELECTRICAL CHARACTERISTICS (TC=25°C, unless otherwise specified)

PARAMETER		SYMBOL	TEST CONDITIONS	MIN	ТҮР	MAX	UNIT
OFF CHARACTERISTICS							
Drain-Source Breakdown Voltage		BV _{DSS}	V _{GS} = 0V, I _D = 250μA	600			V
Drain-Source Leakage Current		I _{DSS}	$V_{DS} = 600V, V_{GS} = 0V$			10	μA
Cata Sauraa Laakaga Currant	Forward		$V_{GS} = 30V, V_{DS} = 0V$			100	nA
Gate-source Leakage current	Reeverse	IGSS	$V_{GS} = -30V, V_{DS} = 0V$			-100	nA
ON CHARACTERISTICS							
Gate Threshold Voltage		V _{GS(TH)}	$V_{DS} = V_{GS}$, $I_D = 250 \mu A$	2.0		4.0	V
Static Drain-Source On-State Res	istance	R _{DS(ON)}	V _{GS} = 10V, I _D =1A		4	4.4	Ω
DYNAMIC CHARACTERISTICS							
Input Capacitance		C _{ISS}			300	-	рF
Output Capacitance		Coss	$V_{DS} = 25V, V_{GS} = 0V,$		45	-	рF
Reverse Transfer Capacitance		C _{RSS}			2	-	рF
SWITCHING CHARACTERISTICS					-		-
Turn-On Delay Time		t _{D(ON)}			10	-	ns
Turn-On Rise Time		t _R	V _{DD} =300V, I _D =2A, R _G =25Ω		25	-	ns
Turn-Off Delay Time		t _{D(OFF)}	(Note 1, 2)		20	-	ns
Turn-Off Fall Time		t⊧			25	-	ns
Total Gate Charge Q _G V 4001/1 - 2.44.17		$y_{1} = 480y_{1} = 2.44$ $y_{2} = 10y_{1}$		5.7	-	nC	
Gate-Source Charge		Q _{GS}	$V_{DS} = 480V, I_D = 2.4A, V_{GS} = 10V$		1.8	-	nC
Gate-Drain Charge		\mathbf{Q}_{GD}			2	-	nC
SOURCE- DRAIN DIODE RATINGS AND CHARACTERISTICS							
Drain-Source Diode Forward Voltage		V_{SD}	$V_{GS} = 0 V$, $I_{SD} = 2.0 A$			1.4	V
Maximum Continuous Drain-Source Diode		la				2.0	Λ
Forward Current	15				2.0	^	
Maximum Pulsed Drain-Source Diode		1514				8.0	А
Forward Current		ואוכי				0.0	
Reverse Recovery Time		t _{rr}	$V_{GS} = 0 V, I_S = 2A,$	L	357		ns
Reverse Recovery Charge		Q _{RR}	dIF/dt = 100 A/μs (Note 1)		2		μC

Notes: 1. Pulse Test: Pulse width≤300µs, Duty cycle≤2%

2.Essentially independent of operating temperature



TEST CIRCUITS AND WAVEFORMS



Peak Diode Recovery dv/dt Waveforms

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MDT2N60

TEST CIRCUITS AND WAVEFORMS(Cont.)







TYPICAL CHARACTERISTICS





MDT2N60

TO-220F Mechanical Drawing



ITO-	220F	Unitmm
DIM	MIN	MAX
A	14.50	15.50
В	9.50	10.50
C	2.50	2.90
D	6.30	7.30
E	3.30	4.30
F	13.00	14.00
G	2.35	2.75
н	0.30	0.90
1	0.90	1.50
J	3.20	3.80
к	4.24	4.84
L	2.52	2.92
M	1.09	1.49
N	0.47	0.64



TO-251 Mechanical Drawing

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TO-251 (IPAK)			
	Unit:mm		
DIM	MIN	MAX	
А	6.85	7.25	
В	5.90	6.30	
С	5.13	5.53	
D	6.40	6.80	
Е	3.95	4.35	
F	2.19	2.39	
G	0.45	0.85	
Н	2.20	2.40	
Ι	0.41	0.61	
J	0.71	1.31	
К	0.41	0.61	





TO-252 Mechanical Drawing





TO-252 (DPAK)		
	Unit:mm	
DIM	MIN	MAX
A	6.85	7.25
В	5.90	6.30
С	5.13	5.53
D	6.40	6.80
Е	2.90	3.30
F	2.19	2.39
G	0.45	0.85
Н	2.20	2.40
Ι	0.41	0.61
J	0°	8°
K	1.45	1.85
L	0.41	0.61
М	0.00	0.12
Ν	0.60	1.00





NOTE:

- 1. Exceeding the maximum ratings of the device in performance may cause damage to the device, even the permanent failure, which may affect the dependability of the machine. Please do not exceed the absolute maximum ratings of the device when circuit designing.
- 2. When installing the heat sink, please pay attention to the torsional moment and the smoothness of the heat sink.
- 3. MOSFETs is the device which is sensitive to the static electricity, it is necessary to protect the device from being damaged by the static electricity when using it.
- 4. Shenzhen Minos reserves the right to make changes in this specification sheet and is subject to change withoutprior notice.

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