



## PRODUCT SPECIFICATIONS

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TYPE: MTP2N50E

CASE OUTLINE: TO-220

### HIGH VOLTAGE POWER MOSFET N-CHANNEL

#### ABSOLUTE MAXIMUM RATING:

Drain – Source Voltage	$V_{DSS}$	500	Vdc
Drain – Gate Voltage	$V_{DGR}$	500	Vdc
Drain Current – Continuous	$I_D$	2.0	Adc
Drain Current – Pulsed	$I_{DM}$	6.0	Adc
Gate – Source Voltage	$V_{GS}$	$\pm 20$	Vdc
Power Dissipation	$P_D$	75	Watts
Inductive Current	$I_L$		Adc
Operating and Storage Temperature	$T_J$ & $T_{stg}$	-55 to +150	$^{\circ}C$
Lead Temperature From Case	$T_L$	260	$^{\circ}C$

#### ELECTRICAL CHARACTERISTICS TA @ 25°C

Parameters	Symbol	Test Conditions	Min	Typ	Max	Unit
Drain Source Breakdown Voltage	$BV_{DSS}$	$I_D = 250\mu A$ $V_{GS} = 0$	500			Vdc
Gate Threshold Voltage	$V_{GS(th)}$	$I_D = 250\mu A$ $V_{DS} = V_{GS}$	2.0		4.0	Vdc
Gate – Body Leakage Current	$I_{GSS}$	$V_{GS} = \pm 20V$			100	nA
Zero Gate Voltage Drain Current	$I_{DSS}$	$V_{DS} = 500V$ $V_{GS} = 0$ $V_{DS} = 500V$ $V_{GS} = 0$ $T_J = 125^{\circ}C$			10 100	$\mu A$ $\mu A$
On State Drain Current	$I_{D(on)}$					Adc
Drain Source On-Resistance	$r_{DS(on)}$	$I_D = 1.0A$ $V_{GS} = 10V$		2.7	4.0	Ohms
Forward Transconductance	$g_{FS}$	$I_D = 1.0A$ $V_{DS} = 15V$	1.0	1.6	-	mhos
Drain-Source On Voltage	$V_{DS(on)}$	$I_D = 2.0A$ $V_{GS} = 10V$ $I_D = 1.0A$ $V_{GS} = 10V$ $T_J = 125^{\circ}C$		5.9 -	9.6 8.4	Vdc
Drain-Source-On Voltage	$V_{DS(on)}$					Vdc
Input Capacitance	$C_{iss}$			323	450	pF
Output Capacitance	$C_{oss}$	$V_{DS} = 25V$ $V_{GS} = 0$ $f = 1.0MHz$		45	60	pF
Reverse Transfer Capacitance	$C_{rss}$			9.0	20	pF



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Drain Source Diode Characteristics		Symbol	Min	Typ	Max	Units
Forward On Voltage	$I_S = 2.0A$ $V_{GS} = 0$ $I_S = 2.0A$ $V_{GS} = 0$ $T_J = 125^\circ C$	$V_{SD}$		0.82 0.69	1.6 -	Vdc
Reverse Recovery Time	$I_S = 2.0A$ $V_{GS} = 0$ $di_S / dt = 100A/\mu s$	$t_{rr}$		334		ns
Reverse Recovery Charge		$Q_{rr}$		0.985		$\mu C$
Gate Charge	$I_D = 2.0A$ $V_{DS} = 400V$ $V_{GS} = 10V$	$Q_t$		11	15	nC
		$Q_1$		2.0		nC
		$Q_2$		5.4		nC
		$Q_3$		5.1		

Switching Characteristics		Symbol	Min	Typ	Max	Units
Turn-On Time		$t_{on}$				
Turn-Off Time		$t_{off}$				
Delay Time (Turn On)	$I_D = 2.0A$ $V_{DD} = 250V$ $V_{GS} = 10V$ $R_{gen} = 9.1\dot{U}$	$t_{d(on)}$		8.0	16	ns
Rise Time		$t_r$		6.0	12	ns
Delay Time (Turn Off)		$t_{d(off)}$		16	32	ns
Fall Time		$t_f$		10	20	ns

Thermal Characteristics		Symbol			Units
Junction To Case		$R_{\theta JC}$	1.67		$^\circ C/W$
Junction To Ambient		$R_{\theta JA}$	62.5		$^\circ C/W$
Internal Package Inductance		Symbol	Typ	Max	Units
Internal Drain Inductance		$L_d$	4.5		nH
Internal Source Inductance		$L_s$	7.5		nH