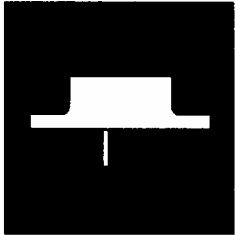


POWER MOSFETS IN A TO-3 PACKAGE



400V Thru 1000V, N-Channel
Size 6 MOSFETs, High Energy Capability

FEATURES

- TO-3 Package Hermetic, .060 Dia. Leads
- Size 6 Die, High Energy
- Fast Switching, Low Drive Current
- Low $R_{DS(on)}$
- Available Screened To MIL-S-19500, TX, TXV And S Levels

DESCRIPTION

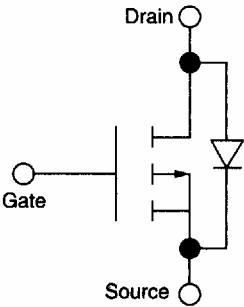
This series of hermetically packaged products feature the latest advanced MOSFET and packaging technology. They are ideally suited for Military requirements where small size, high performance and high reliability are required, and in applications such as switching power supplies, motor controls, inverters, choppers, audio amplifiers and high energy pulse circuits. This series also features avalanche high energy capability at elevated temperatures.

MAXIMUM RATINGS

PART NUMBER	V_{DS} (V)	$R_{DS(on)}$ (Ω)	I_D (A)
OM360NK	400	.20	24
OM460NK	500	.25	22
OM10N100NK	1000	1.30	10

3.1

SCHEMATIC



ELECTRICAL CHARACTERISTICS: OM360NK ($T_C = 25^\circ$ unless otherwise noted)

Characteristic	Symbol	Min.	Typ.	Max.	Unit
OFF CHARACTERISTICS					
Drain-Source Breakdown Voltage ($V_{GS} = 0, I_D = 0.25 \text{ mA}$)	$V_{DS(BR)}$	400	-	-	Vdc
Zero Gate Voltage Drain ($V_{DS} = 400 \text{ V}, V_{GS} = 0$)	I_{DSS}	-	-	0.25	mA
($V_{DS} = 400 \text{ V}, V_{GS} = 0, T_J = 125^\circ \text{ C}$)		-	-	1.0	
Gate-Body Leakage Current, Forward ($V_{GSF} = 20 \text{ Vdc}, V_{DS} = 0$)	I_{GSSF}	-	-	100	nA
Gate-Body Leakage Current, Reverse ($V_{GSR} = 20 \text{ Vdc}, V_{DS} = 0$)	I_{GSSR}	-	-	100	nA
ON CHARACTERISTICS*					
Gate-Threshold Voltage ($V_{DS} = V_{GS}, I_D = 0.25 \text{ mA}$) ($T_J = 125^\circ \text{ C}$)	$V_{GS(th)}$	2.0 1.5	3.0	4.0 3.5	Vdc
Static Drain-Source On-Resistance ($V_{GS} = 10 \text{ Vdc}, I_D = 12 \text{ Adc}$)	$R_{DS(on)}$	-	-	0.20	Ohm
Drain-Source On-Voltage ($V_{GS} = 10 \text{ Vdc}$) ($I_D = 24 \text{ A}$)	$V_{DS(on)}$	-	-	5.4	Vdc
($I_D = 12 \text{ A}, T_J = 125^\circ \text{ C}$)		-	-	5.4	
Forward Transconductance ($V_{DS} = 15 \text{ Vdc}, I_D = 12 \text{ Adc}$)	g_{FS}	14	-	-	mhos
DYNAMIC CHARACTERISTICS					
Input Capacitance ($V_{DS} = 25 \text{ V}, V_{GS} = 0$)	C_{iss}	-	4000	-	pF
Output Capacitance ($f = 1.0 \text{ MHz}$)	C_{oss}	-	550	-	
Transfer Capacitance	C_{iss}	-	110	-	
SWITCHING CHARACTERISTICS					
Turn-On Delay Time	$t_{d(on)}$	-	30	-	ns
Rise Time	t_r	-	95	-	
Turn-Off Delay Time	$t_{d(off)}$	-	80	-	
Fall Time	t_f	-	80	-	
Total Gate Charge ($V_{DS} = 320 \text{ V}, I_D = 24 \text{ A}$)	Q_g	-	110	-	nC
Gate-Source Charge ($V_{GS} = 10 \text{ V}$)	Q_{gs}	-	22	-	
Gate-Drain Charge	Q_{gd}	-	46	-	
SOURCE DRAIN DIODE CHARACTERISTICS					
Forward On-Voltage ($I_S = 24 \text{ A}, dI/dt = 100 \text{ A}/\mu\text{s}$)	V_{SD}	-	1.1	1.6	Vdc
Forward Turn-On Time	t_{on}	-	**	-	ns
Reverse Recovery Time	t_r	-	500	1000	

ELECTRICAL CHARACTERISTICS: OM460NK ($T_C = 25^\circ$ unless otherwise noted)

Characteristic	Symbol	Min.	Typ.	Max.	Unit
OFF CHARACTERISTICS					
Drain-Source Breakdown Voltage ($V_{GS} = 0, I_D = 0.25 \text{ mA}$)	$V_{DS(BR)}$	500	-	-	Vdc
Zero Gate Voltage Drain ($V_{DS} = 500 \text{ V}, V_{GS} = 0$)	I_{DSS}	-	-	0.25	mA
($V_{DS} = 500 \text{ V}, V_{GS} = 0, T_J = 125^\circ \text{ C}$)		-	-	1.0	
Gate-Body Leakage Current, Forward ($V_{GSF} = 20 \text{ Vdc}, V_{DS} = 0$)	I_{GSSF}	-	-	100	nA
Gate-Body Leakage Current, Reverse ($V_{GSR} = 20 \text{ Vdc}, V_{DS} = 0$)	I_{GSSR}	-	-	100	nA
ON CHARACTERISTICS*					
Gate-Threshold Voltage ($V_{DS} = V_{GS}, I_D = 0.25 \text{ mA}$) ($T_J = 125^\circ \text{ C}$)	$V_{GS(th)}$	2.0 1.5	3.0	4.0 3.5	Vdc
Static Drain-Source On-Resistance ($V_{GS} = 10 \text{ Vdc}, I_D = 11 \text{ Adc}$)	$R_{DS(on)}$	-	-	0.25	Ohm
Drain-Source On-Voltage ($V_{GS} = 10 \text{ Vdc}$) ($I_D = 22 \text{ A}$)	$V_{DS(on)}$	-	-	8.0	Vdc
($I_D = 11 \text{ A}, T_J = 125^\circ \text{ C}$)		-	-	8.0	
Forward Transconductance ($V_{DS} = 15 \text{ Vdc}, I_D = 11 \text{ Adc}$)	g_{FS}	11	-	-	mhos
DYNAMIC CHARACTERISTICS					
Input Capacitance ($V_{DS} = 25 \text{ V}, V_{GS} = 0$)	C_{iss}	-	4000	-	pF
Output Capacitance ($f = 1.0 \text{ MHz}$)	C_{oss}	-	480	-	
Transfer Capacitance	C_{iss}	-	95	-	
SWITCHING CHARACTERISTICS					
Turn-On Delay Time	$t_{d(on)}$	-	32	-	ns
Rise Time	t_r	-	95	-	
Turn-Off Delay Time	$t_{d(off)}$	-	80	-	
Fall Time	t_f	-	80	-	
Total Gate Charge ($V_{DS} = 400 \text{ V}, I_D = 22 \text{ A}$)	Q_g	-	115	-	nC
Gate-Source Charge ($V_{GS} = 10 \text{ V}$)	Q_{gs}	-	22	-	
Gate-Drain Charge	Q_{gd}	-	46	-	
SOURCE DRAIN DIODE CHARACTERISTICS					
Forward On-Voltage ($I_S = 22 \text{ A}, dI/dt = 100 \text{ A}/\mu\text{s}$)	V_{SD}	-	1.1	1.6	Vdc
Forward Turn-On Time	t_{on}	-	**	-	ns
Reverse Recovery Time	t_r	-	500	1000	

* Indicates Pulse Test = 300 μs , Duty Cycle = 2%. ** Limited by circuit inductance

ELECTRICAL CHARACTERISTICS: OM10N100NK ($T_C = 25^\circ$ unless otherwise noted)

Characteristic	Symbol	Min.	Typ.	Max.	Unit	
OFF CHARACTERISTICS						
Drain-Source Breakdown Voltage ($V_{GS} = 0, I_D = 0.25 \text{ mA}$)	$V_{(BR)DSS}$	1000	-	-	Vdc	
Zero Gate Voltage Drain ($V_{DS} = 1000 \text{ V}, V_{GS} = 0$) ($V_{DS} = 1000 \text{ V}, V_{GS} = 0, T_J = 125^\circ \text{ C}$)	I_{DSS}	-	-	0.25 1.0	mAdc	
Gate-Body Leakage Current, Forward ($V_{GSF} = 20 \text{ Vdc}, V_{DS} = 0$)	I_{GSSF}	-	-	100	nAdc	
Gate-Body Leakage Current, Reverse ($V_{GSR} = 20 \text{ Vdc}, V_{DS} = 0$)	I_{GSSR}	-	-	100	nAdc	
ON CHARACTERISTICS*						
Gate-Threshold Voltage ($V_{DS} = V_{GS}, I_D = 0.25 \text{ mAdc}$) ($T_J = 125^\circ \text{ C}$)	$V_{GS(th)}$	2.0 1.5	3.0 -	4.5 4.0	Vdc	
Static Drain-Source On-Resistance ($V_{GS} = 10 \text{ Vdc}, I_D = 5 \text{ Adc}$)	$R_{DS(on)}$	-	-	1.3	Ohm	
Drain-Source On-Voltage ($V_{GS} = 10 \text{ Vdc}$) ($I_D = 10 \text{ A}$) ($I_D = 5 \text{ A}, T_J = 125^\circ \text{ C}$)	$V_{DS(on)}$	- -	- -	- 14 14	Vdc	
Forward Transconductance ($V_{DS} = 15 \text{ Vdc}, I_D = 5 \text{ Adc}$)	g_{FS}	5.0	-	-	mhos	
DYNAMIC CHARACTERISTICS-						
Input Capacitance	$(V_{DS} = 25 \text{ V}, V_{GS} = 0,$ $f = 1.0 \text{ MHz})$	C_{iss}	-	3900	pF	
Output Capacitance		C_{oss}	-	300		
Transfer Capacitance		C_{rss}	-	65		
SWITCHING CHARACTERISTICS						
Turn-On Delay Time	$(V_{DD} = 500 \text{ V}, I_D = 10 \text{ A},$ $R_{gen} = 9.1 \text{ ohms})$	$t_{d(on)}$	-	40	ns	
Rise Time		t_r	-	60		
Turn-Off Delay Time		$t_{d(off)}$	-	100		
Fall Time		t_f	-	70		
Total Gate Charge	$(V_{DS} = 500 \text{ V}, I_D = 10 \text{ A},$ $V_{GS} = 10 \text{ V})$	Q_g	-	100	nC	
Gate-Source Charge		Q_{gs}	-	20		
Gate-Drain Charge		Q_{gd}	-	40		
SOURCE DRAIN DIODE CHARACTERISTICS						
Forward On-Voltage	$(I_S = 10 \text{ A}, d/dt = 100 \text{ A}/\mu\text{s})$	V_{SD}	-	-	1.1	Vdc
Forward Turn-On Time		t_{on}	-	**	-	ns
Reverse Recovery Time		t_{rr}	-	600	1000	

* Indicates Pulse Test = 300 μsec , Duty Cycle = 2%

** Limited by circuit inductance

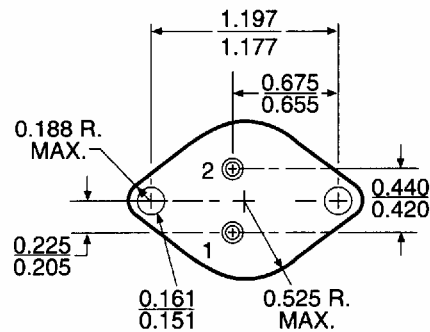
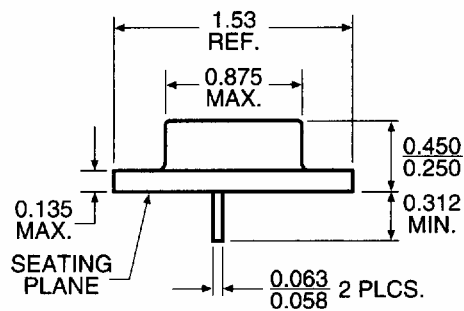
ABSOLUTE MAXIMUM RATINGS ($T_C = 25^\circ\text{C}$ unless otherwise noted)

Parameter		OM360NK	OM460NK	OM10N100NK	Units
V_{DS}	Drain-Source Voltage	400	500	1000	V
V_{DGR}	Drain-Gate Voltage ($R_{GS} = 1\text{ M}\Omega$)	400	500	1000	V
$I_D @ T_C = 25^\circ\text{C}$	Continuous Drain Current	24	22	10	A
I_{DM}	Pulsed Drain Current	92	85	40	A
$P_D @ T_C = 25^\circ\text{C}$	Maximum Power Dissipation	200	200	200	W
	Derate Above $25^\circ\text{C } T_C$	1.33	1.33	1.33	W/ $^\circ\text{C}$
$W_{DSS} (1)$	Single Pulse Energy				
	Drain To Source @ 25°C	1000	1200	1000	mJ
T_J	Operating and				
T_{stg}	Storage Temperature Range	-55 to 150	-55 to 150	-55 to 150	$^\circ\text{C}$
Lead Temperature	(1/8" from case for 5 secs.)	275	275	275	$^\circ\text{C}$

Note 1: $V_{DD} = 50\text{V}$, $I_D = \text{as noted}$

THERMAL RESISTANCE (Maximum) at $T_A = 25^\circ\text{C}$

R_{thJC}	Junction-to-Case	.75	$^\circ\text{C/W}$	
R_{thJA}	Junction-to-Ambient	30	$^\circ\text{C/W}$	Free Air Operation
	Derate above $25^\circ\text{C } T_A$	.033	W/ $^\circ\text{C}$	

MECHANICAL OUTLINE**3.1****Pin Connection**

Pin 1: Gate
Pin 2: Source
Case: Drain