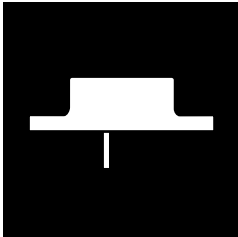


POWER MOSFETS IN A TO-3 PACKAGE



**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

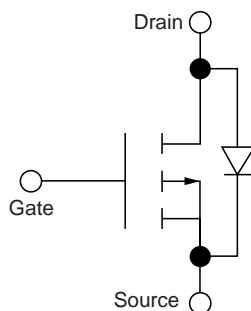
This series of hermetically packaged products feature the latest advanced MOSFET and packaging technology. They are ideally suited for Military requirements where small size, high performance and high reliability are required, and in applications such as switching power supplies, motor controls, inverters, 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)	$R_{DS(on)}$ ()	I_D (A)
OM360NK	400	.20	24
OM460NK	500	.25	22
OM10N100NK	1000	1.30	10

3.1

SCHEMATIC



OM360NK - OM10N100NK

ELECTRICAL CHARACTERISTICS: OM360NK (T_C = 25° unless otherwise noted)

Characteristic	Symbol	Min.	Typ.	Max.	Unit	
OFF CHARACTERISTICS						
Drain-Source Breakdown Voltage (V _{GS} = 0, I _D = 0.25 mA)	V _{(BR)DSS}	400	-	-	Vdc	
Zero Gate Voltage Drain (V _{DS} = 400 V, V _{GS} = 0)	I _{DSS}	-	-	0.25	mAdc	
(V _{DS} = 400 V, V _{GS} = 0, T _J = 125° C)		-	-	1.0		
Gate-Body Leakage Current, Forward (V _{GSF} = 20 Vdc, V _{DS} = 0)	I _{GSSF}	-	-	100	nAdc	
Gate-Body Leakage Current, Reverse (V _{GSR} = 20 Vdc, V _{DS} = 0)	I _{GSSR}	-	-	100	nAdc	
ON CHARACTERISTICS*						
Gate-Threshold Voltage (V _{DS} = V _{GS} , I _D = 0.25 mAdc) (T _J = 125° C)	V _{GS(th)}	2.0 1.5	3.0 -	4.0 3.5	Vdc	
Static Drain-Source On-Resistance (V _{GS} = 10 Vdc, I _D = 12 Adc)	R _{DS(on)}	-	-	0.20	Ohm	
Drain-Source On-Voltage (V _{GS} = 10 Vdc) (I _D = 24 A)	V _{DS(on)}	-	-	5.4	Vdc	
(I _D = 12 A, T _J = 125° C)		-	-	5.4		
Forward Transconductance (V _{DS} = 15 Vdc, I _D = 12 Adc)	g _{FS}	14	-	-	mhos	
DYNAMIC CHARACTERISTICS						
Input Capacitance (V _{DS} = 25 V, V _{GS} = 0, f = 1.0 MHz)	C _{iss}	-	4000	-	pF	
Output Capacitance	C _{oss}	-	550	-		
Transfer Capacitance	C _{rss}	-	110	-		
SWITCHING CHARACTERISTICS						
Turn-On Delay Time	(V _{DD} = 200 V, I _D = 24 A, R _{gen} = 4.3 ohms)	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 V, I _D = 24 A, V _{GS} = 10 V)		Q _g	-	110	-	nC
Gate-Source Charge		Q _{gs}	-	22	-	
Gate-Drain Charge		Q _{gd}	-	46	-	
SOURCE DRAIN DIODE CHARACTERISTICS						
Forward On-Voltage (I _S = 24 A, d/dt = 100 A/μs)	V _{SD}	-	1.1	1.6	Vdc	
Forward Turn-On Time	t _{on}	-	**	-	ns	
Reverse Recovery Time	t _{rr}	-	500	1000		

ELECTRICAL CHARACTERISTICS: OM460NK (T_C = 25° unless otherwise noted)

Characteristic	Symbol	Min.	Typ.	Max.	Unit	
OFF CHARACTERISTICS						
Drain-Source Breakdown Voltage (V _{GS} = 0, I _D = 0.25 mA)	V _{(BR)DSS}	500	-	-	Vdc	
Zero Gate Voltage Drain (V _{DS} = 500 V, V _{GS} = 0)	I _{DSS}	-	-	0.25	mAdc	
(V _{DS} = 500 V, V _{GS} = 0, T _J = 125° C)		-	-	1.0		
Gate-Body Leakage Current, Forward (V _{GSF} = 20 Vdc, V _{DS} = 0)	I _{GSSF}	-	-	100	nAdc	
Gate-Body Leakage Current, Reverse (V _{GSR} = 20 Vdc, V _{DS} = 0)	I _{GSSR}	-	-	100	nAdc	
ON CHARACTERISTICS*						
Gate-Threshold Voltage (V _{DS} = V _{GS} , I _D = 0.25 mAdc) (T _J = 125° C)	V _{GS(th)}	2.0 1.5	3.0 -	4.0 3.5	Vdc	
Static Drain-Source On-Resistance (V _{GS} = 10 Vdc, I _D = 11 Adc)	R _{DS(on)}	-	-	0.25	Ohm	
Drain-Source On-Voltage (V _{GS} = 10 Vdc) (I _D = 22 A)	V _{DS(on)}	-	-	8.0	Vdc	
(I _D = 11 A, T _J = 125° C)		-	-	8.0		
Forward Transconductance (V _{DS} = 15 Vdc, I _D = 11 Adc)	g _{FS}	11	-	-	mhos	
DYNAMIC CHARACTERISTICS						
Input Capacitance (V _{DS} = 25 V, V _{GS} = 0, f = 1.0 MHz)	C _{iss}	-	4000	-	pF	
Output Capacitance	C _{oss}	-	480	-		
Transfer Capacitance	C _{rss}	-	95	-		
SWITCHING CHARACTERISTICS						
Turn-On Delay Time	(V _{DD} = 250 V, I _D = 22 A, R _{gen} = 4.3 ohms)	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 V, I _D = 22 A, V _{GS} = 10 V)		Q _g	-	115	-	nC
Gate-Source Charge		Q _{gs}	-	22	-	
Gate-Drain Charge		Q _{gd}	-	46	-	
SOURCE DRAIN DIODE CHARACTERISTICS						
Forward On-Voltage (I _S = 22 A, d/dt = 100 A/μs)	V _{SD}	-	1.1	1.6	Vdc	
Forward Turn-On Time	t _{on}	-	**	-	ns	
Reverse Recovery Time	t _{rr}	-	500	1000		

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

3.1

OM360NK - OM10N100NK

ELECTRICAL CHARACTERISTICS: OM10N100NK (T_C = 25° unless otherwise noted)

Characteristic	Symbol	Min.	Typ.	Max.	Unit
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OFF CHARACTERISTICS

Drain-Source Breakdown Voltage (V _{GS} = 0, I _D = 0.25 mA)	V _{(BR)DSS}	1000	-	-	Vdc
Zero Gate Voltage Drain (V _{DS} = 1000 V, V _{GS} = 0)	I _{DSS}	-	-	0.25	mAdc
(V _{DS} = 1000 V, V _{GS} = 0, T _J = 125° C)		-	-	1.0	
Gate-Body Leakage Current, Forward (V _{GSS} = 20 Vdc, V _{DS} = 0)	I _{GSSF}	-	-	100	nAdc
Gate-Body Leakage Current, Reverse (V _{GSR} = 20 Vdc, V _{DS} = 0)	I _{GSSR}	-	-	100	nAdc

ON CHARACTERISTICS*

Gate-Threshold Voltage (V _{DS} = V _{GS} , I _D = 0.25 mAdc) (T _J = 125° C)	V _{GS(th)}	2.0 1.5	3.0 -	4.5 4.0	Vdc
Static Drain-Source On-Resistance (V _{GS} = 10 Vdc, I _D = 5 Adc)	R _{DS(on)}	-	-	1.3	Ohm
Drain-Source On-Voltage (V _{GS} = 10 Vdc) (I _D = 10 A) (I _D = 5 A, T _J = 125° C)	V _{DS(on)}	-	-	14 14	Vdc
Forward Transconductance (V _{DS} = 15 Vdc, I _D = 5 Adc)	g _{FS}	5.0	-	-	mhos

DYNAMIC CHARACTERISTICS-

Input Capacitance	(V _{DS} = 25 V, V _{GS} = 0, f = 1.0 MHz)	C _{ISS}	-	3900	-	pF
Output Capacitance		C _{OSS}	-	300	-	
Transfer Capacitance		C _{rSS}	-	65	-	

SWITCHING CHARACTERISTICS

Turn-On Delay Time	(V _{DD} = 500 V, I _D = 10 A, R _{gen} = 9.1 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 V, I _D = 10 A, V _{GS} = 10 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 A, d/dt = 100 A/μs)	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

3.1

OM360NK - OM10N100NK

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

Parameter	OM360NK	OM460NK	OM10N100NK	Units	
V_{DS}	400	500	1000	V	
V_{DGR}	400	500	1000	V	
$I_D @ T_C = 25^\circ\text{C}$	24	22	10	A	
I_{DM}	92	85	40	A	
$P_D @ T_C = 25^\circ\text{C}$	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

