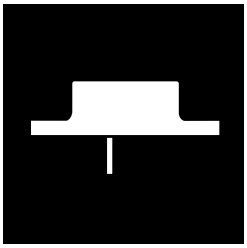
POWER MOSFETS IN A TO-3 PACKAGE



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

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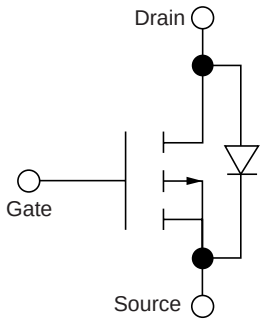
SCHEMATIC



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		I_{DSS}				mAdc
(V_{DS} = 400 V, V_{GS} = 0)			-	-	0.25	
(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		$V_{GS(th)}$				Vdc
(V_{DS} = V_{GS}, I_D = 0.25 mAdc)			2.0	3.0	4.0	
(T_J = 125° C)			1.5	-	3.5	
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)		$V_{DS(on)}$				Vdc
(I_D = 24 A)			-	-	5.4	
(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,	C_{iss}	-	4000	-	pF
Output Capacitance	f = 1.0 MHz)	C_{oss}	-	550	-	
Transfer Capacitance		C_{rss}	-	110	-	
SWITCHING CHARACTERISTICS						
Turn-On Delay Time		$t_{d(on)}$	-	30	-	ns
Rise Time	(V_{DD} = 200 V, I_D = 24 A,	t_r	-	95	-	
Turn-Off Delay Time	R_{gen} = 4.3 ohms)	$t_{d(off)}$	-	80	-	
Fall Time		t_f	-	80	-	
Total Gate Charge	(V_{DS} = 320 V, I_D = 24 A,	Q_g	-	110		nC
Gate-Source Charge	V_{GS} = 10 V)	Q_{gs}	-	22	-	
Gate-Drain Charge		Q_{gd}	-	46	-	
SOURCE DRAIN DIODE CHARACTERISTICS						
Forward On-Voltage		V_{SD}	-	1.1	1.6	Vdc
Forward Turn-On Time	(I_S = 24 A, d/dt = 100 A/µs)	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		I_{DSS}				mAdc
(V_{DS} = 500 V, V_{GS} = 0)			-	-	0.25	
(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		$V_{GS(th)}$				Vdc
(V_{DS} = V_{GS}, I_D = 0.25 mAdc)			2.0	3.0	4.0	
(T_J = 125° C)			1.5	-	3.5	
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)		$V_{DS(on)}$				Vdc
(I_D = 22 A)			-	-	8.0	
(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,	C_{iss}	-	4000	-	pF
Output Capacitance	f = 1.0 MHz)	C_{oss}	-	480	-	
Transfer Capacitance		C_{rss}	-	95	-	
SWITCHING CHARACTERISTICS						
Turn-On Delay Time		$t_{d(on)}$	-	32	-	ns
Rise Time	(V_{DD} = 250 V, I_D = 22 A,	t_r	-	95	-	
Turn-Off Delay Time	R_{gen} = 4.3 ohms)	$T_{d(off)}$	-	80	-	
Fall Time		t_f	-	80	-	
Total Gate Charge	(V_{DS} = 400 V, I_D = 22 A,	Q_g	-	115	-	nC
Gate-Source Charge	V_{GS} = 10 V)	Q_{gs}	-	22	-	
Gate-Drain Charge		Q_{gd}	-	46	-	
SOURCE DRAIN DIODE CHARACTERISTICS						
Forward On-Voltage		V_{SD}	-	1.1	1.6	Vdc
Forward Turn-On Time	(I_S = 22 A, d/dt =100 A/µs)	t_{on}	-	**	-	ns
Reverse Recovery Time		t_{rr}	-	500	1000	

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

ELECTRICAL CHARACTERISTICS: OM10N100NK (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)		$V_{(BR)DSS}$	1000	-	-	Vdc
Zero Gate Voltage Drain		I_{DSS}				mAdc
(V_{DS} = 1000 V, V_{GS} = 0)			-	-	0.25	
(V_{DS} = 1000 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		$V_{GS(th)}$				Vdc
(V_{DS} = V_{GS}, I_D = 0.25 mAdc)			2.0	3.0	4.5	
(T_J = 125° C)			1.5	-	4.0	
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)		$V_{DS(on)}$			-	Vdc
(I_D = 10 A)			-	-	14	
(I_D = 5 A, T_J = 125° C)			-	-	14	
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,	C_{iss}	-	3900	-	pF
Output Capacitance	f = 1.0 MHz)	C_{oss}	-	300	-	
Transfer Capacitance		C_{rss}	-	65	-	
SWITCHING CHARACTERISTICS						
Turn-On Delay Time		$t_{d(on)}$	-	40	-	ns
Rise Time	(V_{DD} = 500 V, I_D = 10 A,	t_r	-	60	-	
Turn-Off Delay Time	R_{gen} = 9.1 ohms)	$t_{d(off)}$	-	100	-	
Fall Time		t_f	-	70	-	
Total Gate Charge	(V_{DS} = 500 V, I_D = 10 A,	Q_g	-	100	-	nC
Gate-Source Charge	V_{GS} = 10 V)	Q_{gs}	-	20	-	
Gate-Drain Charge		Q_{gd}	-	40	-	
SOURCE DRAIN DIODE CHARACTERISTICS						
Forward On-Voltage		V_{SD}	-	-	1.1	Vdc
Forward Turn-On Time	(I_S = 10 A, d/dt = 100 A/µs)	t_{on}		**		ns
Reverse Recovery Time		t_{rr}	-	600	1000	

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

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ABSOLUTE MAXIMUM RATINGS (T_C = 25°C unless otherwise noted)

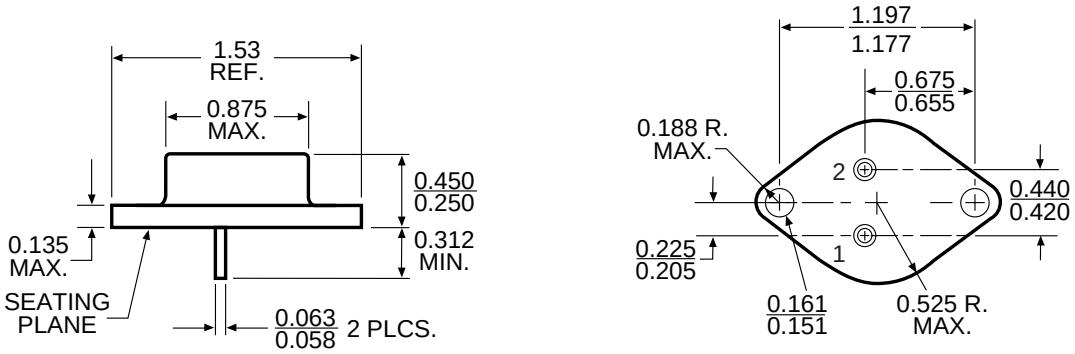
	Parameter	OM360NK	OM460NK	OM10N100NK	Units
V_{DS}	Drain-Source Voltage	400	500	1000	V
V_{DGR}	Drain-Gate Voltage (R_{GS} = 1 M)	400	500	1000	V
I_D @ T_C = 25°C	Continuous Drain Current	24	22	10	A
I_{DM}	Pulsed Drain Current	92	85	40	A
P_D @ T_C = 25°C	Maximum Power Dissipation	200	200	200	W
	Derate Above 25°C T_C	1.33	1.33	1.33	W/°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	°C
Lead Temperature	(1/8" from case for 5 secs.)	275	275	275	°C

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

THERMAL RESISTANCE (Maximum) at T_A = 25°C

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

MECHANICAL OUTLINE



Pin Connection
Pin 1: Gate
Pin 2: Source
Case: Drain

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