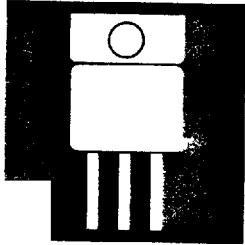


**POWER MOSFET IN HERMETIC ISOLATED
JEDEC TO-258AA PACKAGE**

T-39-13

**100V Thru 1000V, Up To 35 Amp, N-Channel
MOSFET With Low $R_{DS(ON)}$ Characteristics****FEATURES**

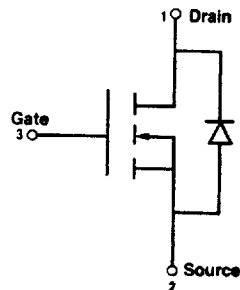
- Isolated Hermetic Metal Package
- Equivalent to Motorola MHR Series
- Fast Switching, Low Drive Current
- Ease of Paralleling For Added Power
- Low $R_{DS(ON)}$
- Available Screened To OM803

2**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.

MAXIMUM RATINGS

PART NUMBER	V_{DS}	$R_{DS(ON)}$	I_D
OM35N10C	100V	.065 Ω	35A
OM30N20C	200V	0.1 Ω	30A
OM15N50C	500V	0.4 Ω	15A
OM5N100C	1000V	3 Ω	5A

SCHEMATIC

T-39-13

ELECTRICAL CHARACTERISTICS: ($T_c = 25^\circ\text{C}$ unless otherwise noted.)
OM35N10C (100V)

Characteristic	Symbol	Min	Max	Unit
OFF CHARACTERISTICS				
Drain-Source Breakdown Voltage ($V_{GS} = 0, I_D = 0.25\text{ mA}$)	$V_{(BR)SS}$	100	-	Vdc
Zero Gate Voltage Drain Current ($V_{DS} = \text{Rated } V_{DSS}, V_{GS} = 0$)	I_{DSS}	-	0.2	mA
($V_{DS} = \text{Rated } V_{DSS}, V_{GS} = 0, T_J = 125^\circ\text{C}$)		-	1	
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 ($V_{DS} = V_{GS}, I_D = 1\text{ mA}$) ($T_J = 100^\circ\text{C}$)	$V_{GS(th)}$	2 1.5	4 3.5	Vdc
Static Drain-Source On-Resistance ($V_{GS} = 10\text{ Vdc}, I_D = 20\text{ Adc}$)	$r_{DS(on)}$	-	0.065	Ohm
Drain-Source On-Voltage ($V_{GS} = 10\text{ V}$) ($I_D = 35\text{ Adc}$)	$V_{DS(on)}$	-	2.3	Vdc
($I_D = 20\text{ Adc}, T_J = 100^\circ\text{C}$)		-	2.6	
Forward Transconductance ($V_{DS} = 15\text{ V}, I_D = 20\text{ A}$)	g_{FS}	10	-	mhos

DYNAMIC CHARACTERISTICS

Input Capacitance	C_{iss}	2800 (Typ)	-	pF
Output Capacitance	C_{oss}	1200 (Typ)	-	
Reverse Transfer Capacitance	C_{rss}	400 (Typ)	-	

SWITCHING CHARACTERISTICS* ($T_J = 100^\circ\text{C}$)

Turn-On Delay Time ($V_{DS} = 50\text{ V}, I_D = 20\text{ A}$)	$t_{d(on)}$	-	40	ns
Rise Time	t_r	-	120	
Turn-Off Delay Time	$t_{d(off)}$	-	150	
Fall Time	t_f	-	100	
Total Gate Charge	Q_g	105 (Typ)	130	nC
Gate-Source Charge	Q_{gs}	15 (Typ)	28	
Gate-Drain Charge	Q_{gd}	45 (Typ)	70	

SOURCE-DRAIN DIODE CHARACTERISTICS*

Forward On-Voltage ($I_S = 35\text{ Amp}$)	V_{SD}	-	2.2	Vdc
Forward Turn-On Time	t_{on}	Limited By Stray Inductance	-	
Reverse Recovery Time	t_{rr}	200 (Typ)	-	ns

*Pulse Test: Pulse Width = 300 μs , Duty Cycle $\leq 2\%$.**ELECTRICAL CHARACTERISTICS: ($T_c = 25^\circ\text{C}$ unless otherwise noted.)**
OM30N20C (200V)

Characteristic	Symbol	Min	Max	Unit
OFF CHARACTERISTICS				
Drain-Source Breakdown Voltage ($V_{GS} = 0, I_D = 0.25\text{ mA}$)	$V_{(BR)SS}$	200	-	Vdc
Zero Gate Voltage Drain Current ($V_{DS} = \text{Rated } V_{DSS}, V_{GS} = 0$)	I_{DSS}	-	0.2	mA
($V_{DS} = \text{Rated } V_{DSS}, V_{GS} = 0, T_J = 125^\circ\text{C}$)		-	1	
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 ($V_{DS} = V_{GS}, I_D = 1\text{ mA}$) ($T_J = 100^\circ\text{C}$)	$V_{GS(th)}$	2 1.5	4 3.5	Vdc
Static Drain-Source On-Resistance ($V_{GS} = 10\text{ Vdc}, I_D = 16\text{ Adc}$)	$r_{DS(on)}$	-	0.1	Ohm
Drain-Source On-Voltage ($V_{GS} = 10\text{ V}$) ($I_D = 30\text{ Adc}$)	$V_{DS(on)}$	-	3.5	Vdc
($I_D = 16\text{ Adc}, T_J = 100^\circ\text{C}$)		-	3.2	
Forward Transconductance ($V_{DS} = 15\text{ V}, I_D = 16\text{ A}$)	g_{FS}	10	-	mhos

DYNAMIC CHARACTERISTICS

Input Capacitance	C_{iss}	2850 (Typ)	-	pF
Output Capacitance	C_{oss}	700 (Typ)	-	
Reverse Transfer Capacitance	C_{rss}	170 (Typ)	-	

SWITCHING CHARACTERISTICS* ($T_J = 100^\circ\text{C}$)

Turn-On Delay Time ($V_{DS} = 100\text{ V}, I_D = 16\text{ A}, R_{\theta JA} = 4.7\text{ Ohms}$)	$t_{d(on)}$	-	40	ns
Rise Time	t_r	-	90	
Turn-Off Delay Time	$t_{d(off)}$	-	150	
Fall Time	t_f	-	100	
Total Gate Charge	Q_g	85 (Typ)	130	nC
Gate-Source Charge	Q_{gs}	15 (Typ)	28	
Gate-Drain Charge	Q_{gd}	40 (Typ)	65	

SOURCE-DRAIN DIODE CHARACTERISTICS*

Forward On-Voltage ($I_S = 30\text{ Amp}, V_{GS} = 0$)	V_{SD}	-	2	Vdc
Forward Turn-On Time	t_{on}	Limited By Stray Inductance	-	
Reverse Recovery Time	t_{rr}	200 (Typ)	-	ns

*Pulse Test: Pulse Width = 300 μs , Duty Cycle $\leq 2\%$.

T-39-13

**ELECTRICAL CHARACTERISTICS: ($T_C = 25^\circ\text{C}$ unless otherwise noted.)
OM15N50C (500V)**

Characteristic	Symbol	Min	Max	Unit
OFF CHARACTERISTICS				
Drain-Source Breakdown Voltage ($V_{GS} = 0, I_D = 0.25\text{ mA}$)	$V_{(BR)SS}$	500	-	Vdc
Zero Gate Voltage Drain Current ($V_{DS} = \text{Rated } V_{DSS}, V_{GS} = 0$)	I_{DSS}	-	0.2	mAdc
($V_{DS} = \text{Rated } V_{DSS}, V_{GS} = 0, T_J = 125^\circ\text{C}$)		-	1	
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 ($V_{DS} = V_{GS}, I_D = 1\text{ mA}$) ($T_J = 100^\circ\text{C}$)	$V_{GS(th)}$	2 1.5	4.5 4	Vdc
Static Drain-Source On-Resistance ($V_{GS} = 10\text{ Vdc}, I_D = 7\text{ Adc}$)	$r_{DS(on)}$	-	0.4	Ohm
Drain-Source-On-Voltage ($V_{GS} = 10\text{ V}$) ($I_D = 15\text{ Adc}$)	$V_{DS(on)}$	-	6	Vdc
($I_D = 7\text{ Adc}, T_J = 100^\circ\text{C}$)		-	5.4	
Forward Transconductance ($V_{DS} = 15\text{ V}, I_D = 7\text{ A}$)	g_{FS}	4	-	mhos

DYNAMIC CHARACTERISTICS

Input Capacitance	C_{iss}	2300 (Typ)	-	pF
Output Capacitance	C_{oss}	330 (Typ)	-	
Reverse Transfer Capacitance	C_{rss}	155 (Typ)	-	

SWITCHING CHARACTERISTICS* ($T_J = 100^\circ\text{C}$)

Turn-On Delay Time	$t_{d(on)}$	-	40	ns
Rise Time	t_r	-	65	
Turn-Off Delay Time	$t_{d(off)}$	-	150	
Fall Time	t_f	-	80	
Total Gate Charge	Q_g	110 (Typ)	160	nC
Gate-Source Charge	Q_{gs}	14 (Typ)	25	
Gate-Drain Charge	Q_{gd}	60 (Typ)	95	

SOURCE-DRAIN DIODE CHARACTERISTICS*

Forward On-Voltage	V_{SD}	1.1 (Typ)	2	Vdc
Forward Turn-On Time	t_{on}	Limited By Stray Inductance	-	
Reverse Recovery Time	t_{rr}	1200 (Typ)	-	ns

*Pulse Test: Pulse Width = 300 μs , Duty Cycle $\leq 2\%$.**ELECTRICAL CHARACTERISTICS: ($T_C = 25^\circ\text{C}$ unless otherwise noted.)
OM5N100C (1000V)**

Characteristic	Symbol	Min	Max	Unit
OFF CHARACTERISTICS				
Drain-Source Breakdown Voltage ($V_{GS} = 0, I_D = 0.25\text{ mA}$)	$V_{(BR)SS}$	1000	-	Vdc
Zero Gate Voltage Drain Current ($V_{DS} = \text{Rated } V_{DSS}, V_{GS} = 0$)	I_{DSS}	-	0.2	mAdc
($V_{DS} = \text{Rated } V_{DSS}, V_{GS} = 0, T_J = 125^\circ\text{C}$)		-	1	
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 ($V_{DS} = V_{GS}, I_D = 1\text{ mA}$) ($T_J = 100^\circ\text{C}$)	$V_{GS(th)}$	2 1.5	4.5 4	Vdc
Static Drain-Source On-Resistance ($V_{GS} = 10\text{ Vdc}, I_D = 2.5\text{ Adc}$)	$r_{DS(on)}$	-	3	Ohms
Drain-Source-On-Voltage ($V_{GS} = 10\text{ V}$) ($I_D = 5\text{ Adc}$)	$V_{DS(on)}$	-	15	Vdc
($I_D = 2.5\text{ Adc}, T_J = 100^\circ\text{C}$)		-	12.5	
Forward Transconductance ($V_{DS} = 15\text{ V}, I_D = 2.5\text{ A}$)	g_{FS}	2	-	mhos

DYNAMIC CHARACTERISTICS

Input Capacitance	C_{iss}	2200 (Typ)	-	pF
Output Capacitance	C_{oss}	220 (Typ)	-	
Reverse Transfer Capacitance	C_{rss}	100 (Typ)	-	

SWITCHING CHARACTERISTICS* ($T_J = 100^\circ\text{C}$)

Turn-On Delay Time	$t_{d(on)}$	-	40	ns
Rise Time	t_r	-	60	
Turn-Off Delay Time	$t_{d(off)}$	-	160	
Fall Time	t_f	-	80	
Total Gate Charge	Q_g	110 (Typ)	140	nC
Gate-Source Charge	Q_{gs}	14 (Typ)	25	
Gate-Drain Charge	Q_{gd}	50 (Typ)	90	

SOURCE-DRAIN DIODE CHARACTERISTICS*

Forward On-Voltage	V_{SD}	-	1.6	Vdc
Forward Turn-On Time	t_{on}	Limited By Stray Inductance	-	
Reverse Recovery Time	t_{rr}	1.2 (Typ)	-	μs

*Pulse Test: Pulse Width = 300 μs , Duty Cycle $\leq 2\%$.

2

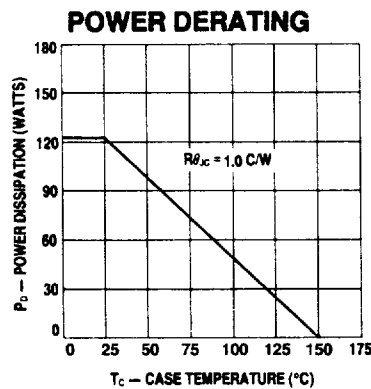
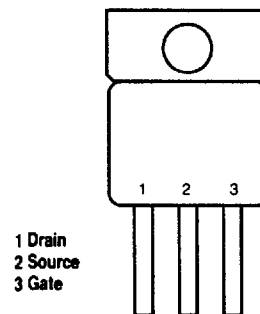
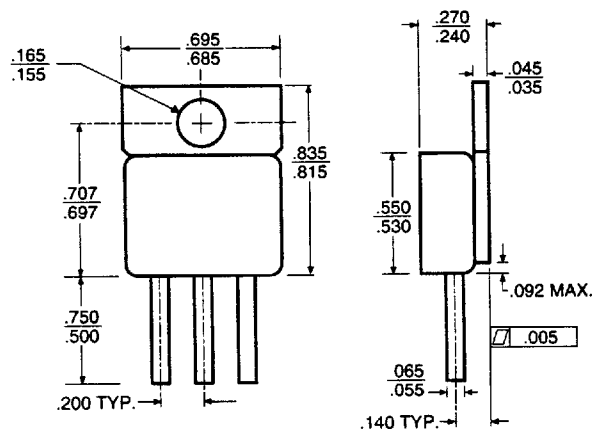
T-39-13

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

Parameter	OM35N10	OM30N20	OM15N50	OM5N100	Units
V_{DS} Drain-Source Voltage	100	200	500	1000	V
V_{DGR} Drain-Gate Voltage ($R_{GS} = 1\text{M}\Omega$)	100	200	500	1000	V
$I_D @ T_c = 25^\circ\text{C}$ Continuous Drain Current	35	30	15	5	A
V_{GS} Continuous Gate-Source Voltage	± 20	± 20	± 20	± 20	V
V_{GSM} Gate-Source Voltage Non-Repetitive ($t_p \leq 50\mu\text{s}$)	± 40	± 40	± 40	± 40	V
I_{DM} Pulsed Drain Current ¹	105	60	65	17	A
$P_D @ T_c = 25^\circ\text{C}$ Max. Power Dissipation	125	125	125	125	W
$P_D @ T_c = 100^\circ\text{C}$ Max. Power Dissipation	50	50	50	50	W
Junction to Case Linear Derating Factor ¹	1.0	1.0	1.0	1.0	W/ $^\circ\text{C}$
Junction to Ambient Linear Derating Factor	.025	.025	.025	.025	W/ $^\circ\text{C}$
T_J Operating and T_{stg} Storage Temperature Range	-55 to 150	-55 to 150	-55 to 150	-55 to 150	$^\circ\text{C}$
Lead Temperature ($1/8"$ from case for 5 seconds)	275	275	275	275	$^\circ\text{C}$

¹ Pulse Test: Pulse Width $\leq 300\mu\text{sec}$, Duty Cycle $\leq 2\%$.**THERMAL RESISTANCE (MAXIMUM) at $T_A = 25^\circ\text{C}$**

$R_{\theta JC}$ Junction-to-Case	1.0	$^\circ\text{C/W}$
$R_{\theta JA}$ Junction-to-Ambient	40	$^\circ\text{C/W}$ Free Air Operation

**PIN CONNECTION****MECHANICAL OUTLINE**

205 Crawford Street, Leominster, MA 01453 (508) 534-5776 FAX (508) 537-4246

2-22