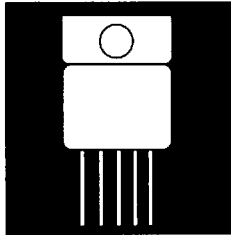


POWER MOSFETS & FAST RECOVERY RECTIFIER IN HERMETIC ISOLATED JEDEC MO-078 PACKAGE



**100V Thru 500V, Up To 14 Amp, N-Channel
MOSFET And Fast Recovery Power Rectifier**

FEATURES

- Uncommitted MOSFET And Rectifier In One Package
- Isolated Hermetic 5-Pin Metal Package
- Fast Switching, Low $R_{DS(on)}$ MOSFET
- Ultra-Fast Recovery, Low V_F Rectifier
- Available Screened To OM803

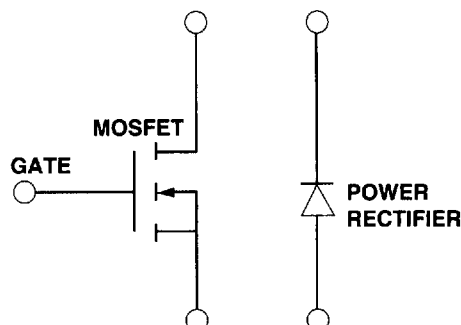
DESCRIPTION

This series of hermetically packaged products feature the latest advanced MOSFET and ultra-fast recovery rectifier with innovative 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.

PART NUMBER	MOSFET			RECTIFIER		
	V_{DS}	$R_{DS(on)}$	I_D	V_F	I_O	T_{RR}
OM9007SC	100 V	.18 Ω	14 A	0.975 V	14 A	35 ns
OM9008SC	200 V	.40 Ω	9 A	0.925 V	9 A	35 ns
OM9009SC	400 V	1.0 Ω	5.5 A	1.5 V	5.5 A	50 ns
OM9010SC	500 V	1.5 Ω	4.5 A	1.5 V	4.5 A	50 ns

2.1

SCHEMATIC



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ELECTRICAL CHARACTERISTICS: ($T_C = 25^\circ\text{C}$ unless otherwise noted)
STATIC P/N OM9007SC (100 V)

MOSFET Parameter	Min.	Typ.	Max.	Units	Test Conditions
BV_{DS} Drain-Source Breakdown Voltage	100			V	$V_{GS} = 0$, $I_D = 250\ \mu\text{A}$
$V_{GS(th)}$ Gate-Threshold Voltage	2.0	4.0		V	$V_{DS} = V_{GS}$, $I_D = 1\ \mu\text{A}$
I_{SSP} Gate-Body Leakage Forward		100		nA	$V_{GS} = +20\ \text{V}$
I_{SSR} Gate-Body Leakage Reverse		-100		nA	$V_{GS} = -20\ \text{V}$
I_{SS} Zero Gate Voltage Drain Current		0.1	0.25	nA	$V_{DS} = \text{Max. Rat.}$, $V_{GS} = 0$
		0.2	1.0	nA	$V_{DS} = 0.8\ \text{Max. Rat.}$, $V_{GS} = 0$, $T_C = 125^\circ\text{C}$
I_{ON} On-State Drain Current ¹	14			A	$V_{DS} \geq 2\ V_{DS(on)}$, $V_{GS} = 10\ \text{V}$
$V_{DS(on)}$ Static Drain-Source On-State Voltage ¹		1.2	1.44	V	$V_{GS} = 10\ \text{V}$, $I_D = 8\ \text{A}$
$R_{DS(on)}$ Static Drain-Source On-State Resistance ¹		0.15	0.18	Ω	$V_{GS} = 10\ \text{V}$, $I_D = 8\ \text{A}$
$R_{DS(on)}$ Static Drain-Source On-State Resistance ¹			0.31	Ω	$V_{GS} = 10\ \text{V}$, $I_D = 8\ \text{A}$, $T_C = 125^\circ\text{C}$

DYNAMIC

g_{fs} Forward Transconductance ¹	4.0	4.4		S	$V_{DS} \geq 2\ V_{DS(on)}$, $I_D = 8\ \text{A}$
C_{iss} Input Capacitance		750		pF	$V_{GS} = 0$
C_{oss} Output Capacitance		250		pF	$V_{DS} = 25\ \text{V}$
C_{rss} Reverse Transfer Capacitance		100		pF	$f = 1\ \text{MHz}$
$t_{turn-on}$ Turn-On Delay Time		15		ns	$V_{DD} = 30\ \text{V}$, $I_D = 8\ \text{A}$
t_r Rise Time		35		ns	$R_{\theta} = 7.5\ \Omega$, $R_L = 4.3\ \Omega$
$t_{turn-off}$ Turn-Off Delay Time		38		ns	(MOSFET switching times are essentially independent of operating temperature.)
t_f Fall Time		23		ns	

THERMAL RESISTANCE

$R_{\theta JA}$ Junction-to-Ambient	1.8	$^\circ\text{C/W}$
$R_{\theta JA}$ Junction-to-Ambient	80	$^\circ\text{C/W}$
		Free Air Operation

RECTIFIER PARAMETER

V_{FM} Maximum Forward Voltage		0.975		V	$T_J = 25^\circ\text{C}$, $I_F = 14\ \text{A}$
		0.900		V	$T_J = 100^\circ\text{C}$, $I_F = 14\ \text{A}$
I_{RR} Maximum Reverse Current		10		μA	$T_J = 25^\circ\text{C}$, $V_R = 100\ \text{V}$
T_{rr} Maximum Reverse Recovery Time [*]		1		ns	$T_J = 100^\circ\text{C}$, $V_R = 100\ \text{V}$
		35		ns	$T_J = 25^\circ\text{C}$
R_{JC} Junction-to-Case		2.0		$^\circ\text{C/W}$	
R_{JA} Junction-to-Ambient		80		$^\circ\text{C/W}$	Free Air Operation

* Measured in Circuit $I_F = 1/2\ \text{A}$, $I_R = 1.0\ \text{A}$, $t_{REC} = 1/4\ \text{A}$ 1 Pulse Test: Pulse Width $\leq 300\ \mu\text{sec}$, Duty Cycle $\leq 2\%$.
ELECTRICAL CHARACTERISTICS: ($T_C = 25^\circ\text{C}$ unless otherwise noted)
STATIC P/N OM9008SC (200 V)

MOSFET Parameter	Min.	Typ.	Max.	Units	Test Conditions
BV_{DS} Drain-Source Breakdown Voltage	200			V	$V_{GS} = 0$, $I_D = 250\ \mu\text{A}$
$V_{GS(th)}$ Gate-Threshold Voltage	2.0	4.0		V	$V_{DS} = V_{GS}$, $I_D = 1\ \text{mA}$
I_{SSP} Gate-Body Leakage Forward		100		nA	$V_{GS} = +20\ \text{V}$
I_{SSR} Gate-Body Leakage Reverse		-100		nA	$V_{GS} = -20\ \text{V}$
I_{SS} Zero Gate Voltage Drain Current		0.1	0.25	nA	$V_{DS} = \text{Max. Rat.}$, $V_{GS} = 0$
		0.2	1.0	nA	$V_{DS} = 0.8\ \text{Max. Rat.}$, $V_{GS} = 0$, $T_C = 125^\circ\text{C}$
I_{ON} On-State Drain Current ¹	9.0			A	$V_{DS} \geq 2\ V_{DS(on)}$, $V_{GS} = 10\ \text{V}$
$V_{DS(on)}$ Static Drain-Source On-State Voltage ¹		1.25	2.0	V	$V_{GS} = 10\ \text{V}$, $I_D = 5.0\ \text{A}$
$R_{DS(on)}$ Static Drain-Source On-State Resistance ¹		0.25	0.4	Ω	$V_{GS} = 10\ \text{V}$, $I_D = 5.0\ \text{A}$
$R_{DS(on)}$ Static Drain-Source On-State Resistance ¹		0.54	0.76	Ω	$V_{GS} = 10\ \text{V}$, $I_D = 5.0\ \text{A}$, $T_C = 125^\circ\text{C}$

DYNAMIC

g_{fs} Forward Transconductance ¹	3.0	5		S	$V_{DS} \geq 2\ V_{DS(on)}$, $I_D = 5.0\ \text{A}$
C_{iss} Input Capacitance		780		pF	$V_{GS} = 0$
C_{oss} Output Capacitance		150		pF	$V_{DS} = 25\ \text{V}$
C_{rss} Reverse Transfer Capacitance		55		pF	$f = 1\ \text{MHz}$
$t_{turn-on}$ Turn-On Delay Time		9		ns	$V_{DD} = 75\ \text{V}$, $I_D = 5.0\ \text{A}$
t_r Rise Time		18		ns	$R_{\theta} = 7.5\ \Omega$, $R_L = 15\ \Omega$
$t_{turn-off}$ Turn-Off Delay Time		45		ns	(MOSFET switching times are essentially independent of operating temperature.)
t_f Fall Time		27		ns	

THERMAL RESISTANCE

$R_{\theta JA}$ Junction-to-Ambient	1.8	$^\circ\text{C/W}$
$R_{\theta JA}$ Junction-to-Ambient	80	$^\circ\text{C/W}$
		Free Air Operation

RECTIFIER PARAMETER

V_{FM} Maximum Forward Voltage		0.925		V	$T_J = 25^\circ\text{C}$, $I_F = 9\ \text{A}$
		0.85		V	$T_J = 100^\circ\text{C}$, $I_F = 9\ \text{A}$
I_{RR} Maximum Reverse Current		15		μA	$T_J = 25^\circ\text{C}$, $V_R = 200\ \text{V}$
T_{rr} Maximum Reverse Recovery Time [*]		1		ns	$T_J = 100^\circ\text{C}$, $V_R = 200\ \text{V}$
		35		ns	$T_J = 25^\circ\text{C}$
R_{JC} Junction-to-Case		2.0		$^\circ\text{C/W}$	
R_{JA} Junction-to-Ambient		80		$^\circ\text{C/W}$	Free Air Operation

* Measured in Circuit $I_F = 1/2\ \text{A}$, $I_R = 1.0\ \text{A}$, $t_{REC} = 1/4\ \text{A}$ 1 Pulse Test: Pulse Width $\leq 300\ \mu\text{sec}$, Duty Cycle $\leq 2\%$.

ELECTRICAL CHARACTERISTICS: ($T_c = 25^\circ\text{C}$ unless otherwise noted)
STATIC P/N OM9009SC (400 V)

MOSFET Parameter	Min.	Typ.	Max.	Units	Test Conditions
BV_{DSS} Drain-Source Breakdown Voltage	400			V	$V_{\text{GS}} = 0$, $I_D = 250\ \mu\text{A}$
$V_{\text{GS(th)}}$ Gate-Threshold Voltage	2.0		4.0	V	$V_{\text{DS}} = V_{\text{GS}}$, $I_D = 1\ \text{mA}$
I_{GSSF} Gate-Body Leakage Forward			100	nA	$V_{\text{GS}} = +20\ \text{V}$
I_{GSSR} Gate-Body Leakage Reverse			-100	nA	$V_{\text{GS}} = -20\ \text{V}$
I_{OSS} Zero Gate Voltage Drain Current		0.1	0.25	mA	$V_{\text{DS}} = \text{Max. Rat.}$, $V_{\text{GS}} = 0$
		0.2	1.0	mA	$V_{\text{DS}} = 0.8\ \text{Max. Rat.}$, $V_{\text{GS}} = 0$, $T_c = 125^\circ\text{C}$
$I_{\text{ON(ON)}}$ On-State Drain Current ¹	5.5			A	$V_{\text{DS}} \geq 2\ V_{\text{DS(on)}}$, $V_{\text{GS}} = 10\ \text{V}$
$V_{\text{DS(on)}}$ Static Drain-Source On-State Voltage ¹		2.4	3.0	V	$V_{\text{GS}} = 10\ \text{V}$, $I_D = 3\ \text{A}$
$R_{\text{DS(on)}}$ Static Drain-Source On-State Resistance ¹		0.8	1.0	Ω	$V_{\text{GS}} = 10\ \text{V}$, $I_D = 3\ \text{A}$
$R_{\text{DS(on)}}$ Static Drain-Source On-State Resistance ¹		1.6	2.0	Ω	$V_{\text{GS}} = 10\ \text{V}$, $I_D = 3\ \text{A}$, $T_c = 125^\circ\text{C}$

DYNAMIC

g_{fs} Forward Transconductance ¹	3.0	3.6		S	$V_{\text{DS}} \geq 2\ V_{\text{DS(on)}}$, $I_D = 3.0\ \text{A}$
C_{iss} Input Capacitance		700		pF	$V_{\text{GS}} = 0$
C_{oss} Output Capacitance		70		pF	$V_{\text{DS}} = 25\ \text{V}$
C_{rss} Reverse Transfer Capacitance		20		pF	$f = 1\ \text{MHz}$
$t_{\text{ON(ON)}}$ Turn-On Delay Time		18		ns	$V_{\text{GS}} = 17.5\ \text{V}$, $I_D = 3.0\ \text{A}$
t_r Rise Time		20		ns	$R_{\text{DS}} = 10\ \Omega$, $R_L = 56\ \Omega$
$t_{\text{OFF(ON)}}$ Turn-Off Delay Time		40		ns	(MOSFET switching times are essentially independent of operating temperature.)
t_f Fall Time		25		ns	

THERMAL RESISTANCE

R_{thJC} Junction-to-Case		1.8	$^\circ\text{C/W}$
R_{thJA} Junction-to-Ambient		80	$^\circ\text{C/W}$ Free Air Operation

RECTIFIER PARAMETER

V_{FM} Maximum Forward Voltage		1.5	V	$T_J = 25^\circ\text{C}$, $I_F = 5.5\ \text{A}$
		1.4	V	$T_J = 100^\circ\text{C}$, $I_F = 5.5\ \text{A}$
I_R Maximum Reverse Current		80	μA	$T_J = 25^\circ\text{C}$, $V_R = 400\ \text{V}$
		2.0	mA	$T_J = 100^\circ\text{C}$, $V_R = 400\ \text{V}$
T_{rr} Maximum Reverse Recovery Time*		50	ns	$T_J = 25^\circ\text{C}$
R_{thJC} Junction-to-Case		2.0	$^\circ\text{C/W}$	
R_{thJA} Junction-to-Ambient		80	$^\circ\text{C/W}$ Free Air Operation	

* Measured in Circuit $I_F = 1/2\ \text{A}$, $I_R = 1.0\ \text{A}$, $t_{\text{rec}} = 1/4\ \text{A}$
1 Pulse Test: Pulse Width $\leq 300\ \mu\text{sec}$, Duty Cycle $\leq 2\%$.

ELECTRICAL CHARACTERISTICS: ($T_c = 25^\circ\text{C}$ unless otherwise noted)
STATIC P/N OM9010SC (500 V)

MOSFET Parameter	Min.	Typ.	Max.	Units	Test Conditions
BV_{DSS} Drain-Source Breakdown Voltage	500			V	$V_{\text{GS}} = 0$, $I_D = 250\ \mu\text{A}$
$V_{\text{GS(th)}}$ Gate-Threshold Voltage	2.0		4.0	V	$V_{\text{DS}} = V_{\text{GS}}$, $I_D = 1\ \text{mA}$
I_{GSSF} Gate-Body Leakage Forward			100	nA	$V_{\text{GS}} = +20\ \text{V}$
I_{GSSR} Gate-Body Leakage Reverse			-100	nA	$V_{\text{GS}} = -20\ \text{V}$
I_{OSS} Zero Gate Voltage Drain Current		0.1	0.25	mA	$V_{\text{DS}} = \text{Max. Rat.}$, $V_{\text{GS}} = 0$
		0.2	1.0	mA	$V_{\text{DS}} = 0.8\ \text{Max. Rat.}$, $V_{\text{GS}} = 0$, $T_c = 125^\circ\text{C}$
$I_{\text{ON(ON)}}$ On-State Drain Current ¹	4.5			A	$V_{\text{DS}} \geq 2\ V_{\text{DS(on)}}$, $V_{\text{GS}} = 10\ \text{V}$
$V_{\text{DS(on)}}$ Static Drain-Source On-State Voltage ¹		3.25	3.75	V	$V_{\text{GS}} = 10\ \text{V}$, $I_D = 2.5\ \text{A}$
$R_{\text{DS(on)}}$ Static Drain-Source On-State Resistance ¹		1.3	1.5	Ω	$V_{\text{GS}} = 10\ \text{V}$, $I_D = 2.5\ \text{A}$
$R_{\text{DS(on)}}$ Static Drain-Source On-State Resistance ¹		2.9	3.3	Ω	$V_{\text{GS}} = 10\ \text{V}$, $I_D = 2.5\ \text{A}$, $T_c = 125^\circ\text{C}$

DYNAMIC

g_{fs} Forward Transconductance ¹	2.5	2.6		S	$V_{\text{DS}} \geq 2\ V_{\text{DS(on)}}$, $I_D = 2.5\ \text{A}$
C_{iss} Input Capacitance		700		pF	$V_{\text{GS}} = 0$
C_{oss} Output Capacitance		90		pF	$V_{\text{DS}} = 25\ \text{V}$
C_{rss} Reverse Transfer Capacitance		30		pF	$f = 1\ \text{MHz}$
$t_{\text{ON(ON)}}$ Turn-On Delay Time		18		ns	$V_{\text{GS}} = 25.5\ \text{V}$, $I_D = 2.5\ \text{A}$
t_r Rise Time		20		ns	$R_{\text{DS}} = 7.5\ \Omega$, $R_L = 88\ \Omega$
$t_{\text{OFF(ON)}}$ Turn-Off Delay Time		42		ns	(MOSFET switching times are essentially independent of operating temperature.)
t_f Fall Time		25		ns	

THERMAL RESISTANCE

R_{thJC} Junction-to-Case		1.8	$^\circ\text{C/W}$
R_{thJA} Junction-to-Ambient		80	$^\circ\text{C/W}$ Free Air Operation

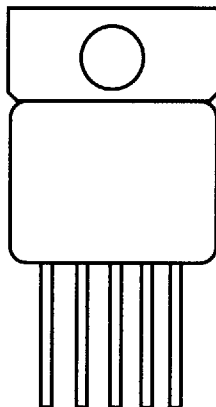
RECTIFIER PARAMETER

V_{FM} Maximum Forward Voltage		1.5	V	$T_J = 25^\circ\text{C}$, $I_F = 4.5\ \text{A}$
		1.4	V	$T_J = 100^\circ\text{C}$, $I_F = 4.5\ \text{A}$
I_R Maximum Reverse Current		100	μA	$T_J = 25^\circ\text{C}$, $V_R = 500\ \text{V}$
		2.5	mA	$T_J = 100^\circ\text{C}$, $V_R = 500\ \text{V}$
T_{rr} Maximum Reverse Recovery Time*		50	ns	$T_J = 25^\circ\text{C}$
R_{thJC} Junction-to-Case		2.0	$^\circ\text{C/W}$	
R_{thJA} Junction-to-Ambient		80	$^\circ\text{C/W}$ Free Air Operation	

* Measured in Circuit $I_F = 1/2\ \text{A}$, $I_R = 1.0\ \text{A}$, $t_{\text{rec}} = 1/4\ \text{A}$
1 Pulse Test: Pulse Width $\leq 300\ \mu\text{sec}$, Duty Cycle $\leq 2\%$.

MECHANICAL SPECIFICATIONS

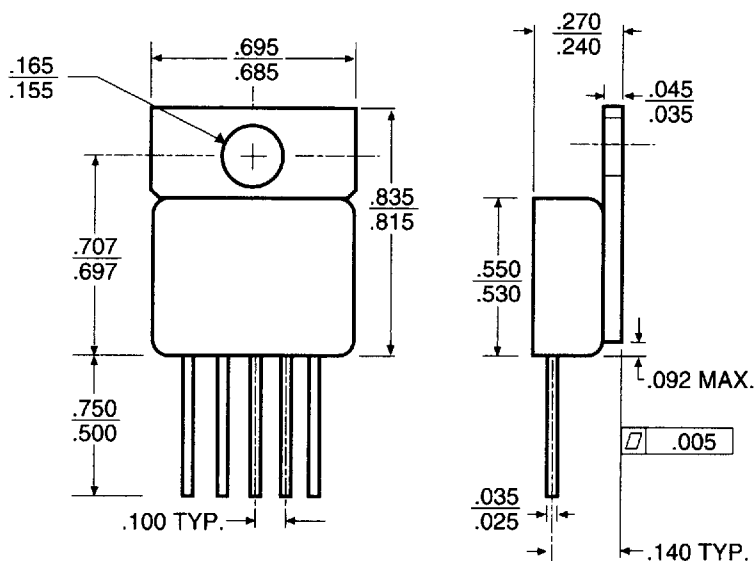
PIN CONNECTION



Pin 1: Gate
 Pin 2: Source
 Pin 3: Drain
 Pin 4: Anode
 Pin 5: Cathode

1 2 3 4 5

MECHANICAL OUTLINE



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