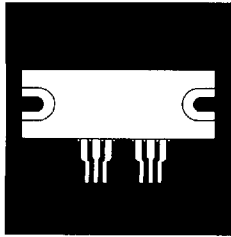


DUAL UNCOMMITTED POWER MOSFETS IN LOW PROFILE PLASTIC POWER PACKAGE



100V Thru 1000V, Up To 30 Amp, N-Channel MOSFETs With Low $R_{DS(on)}$ Characteristics

FEATURES

- Isolated High Density Package
- High Current Dual MOSFETs
- Fast Switching, Low Drive Current
- Ease of Paralleling For Added Power
- Low $R_{DS(on)}$
- Copper Base Plate
- P-Channel Also Available (up to 200V)

DESCRIPTION

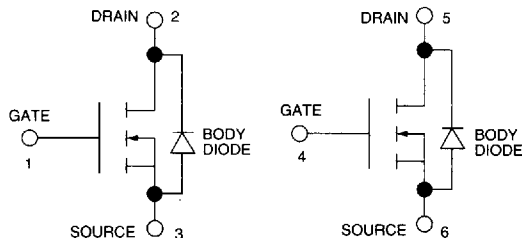
This series of Industrial products feature the latest advanced MOSFET and packaging technology. They are ideally suited where small size, high performance and high reliability are required, in applications such as switching power supplies, motor controls, inverters, choppers, audio amplifiers and high energy pulse circuits.

MAXIMUM RATINGS (Per MOSFET)

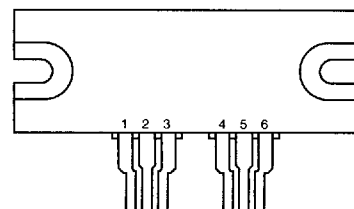
PART NUMBER	V_{DS}	$R_{DS(on)}$	I_D
OM6219SP1	100V	.065 Ω	30A
OM6220SP1	200V	0.1 Ω	25A
OM6221SP1	500V	0.4 Ω	12A
OM6222SP1	1000V	3 Ω	4A

2.1

SCHEMATIC



PIN CONNECTION



Pin 1: Gate
Pin 2: Drain
Pin 3: Source

Pin 4: Gate
Pin 5: Drain
Pin 6: Source

6789073 0001084 292

ELECTRICAL CHARACTERISTICS: Per MOSFET
OM6219SP1 (100V) ($T_C = 25^\circ\text{C}$ unless otherwise noted)

Characteristic	Symbol	Min.	Max.	Units
OFF CHARACTERISTICS				
Drain-Source Breakdown Voltage ($V_{GS} = 0, I_D = 0.25\text{mA}$)	$V_{DS(BR)}$	100	-	Vdc
Zero Gate Voltage Drain Current ($V_{DS} = \text{Rated } V_{DS}, V_{GS} = 0$)	I_{DSS}	-	0.2	mA
($V_{DS} = \text{Rated } V_{DS}, V_{GS} = 0, T_J = 125^\circ\text{C}$)		-	1	
Gate-Body Leakage Current, Forward ($V_{GS} = 20\text{ Vdc}, V_{DS} = 0$)	I_{GSSF}	-	100	nA
Gate-Body Leakage Current, Reverse ($V_{GS} = 20\text{ Vdc}, V_{DS} = 0$)	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 ($V_{GS} = 10\text{ Vdc}, I_D = 20\text{ A}$)	$r_{DS(on)}$	-	0.065	Ohm
Drain-Source-On-Voltage ($V_{GS} = 10\text{ V}$) ($I_D = 30\text{ A}$)	$V_{DS(on)}$	-	2.3	Vdc
($I_D = 20\text{ A}$, $T_J = 100^\circ\text{C}$)		-	2.6	
Forward Transconductance ($V_{DS} = 15\text{ V}, I_D = 20\text{ A}$)	g_{FS}	10	-	mhos

DYNAMIC CHARACTERISTICS

Input Capacitance ($V_{DS} = 25\text{V}, V_{GS} = 0, f = 1\text{MHz}$)	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 ($V_{DS} = 50\text{V}, I_D = 20\text{A}, R_{\theta JA} = 4.7\text{ Ohms}$)	$t_{d(on)}$	-	40	ns
Rise Time	t_r	-	120	
Turn-Off Delay Time	$t_{d(off)}$	-	150	
Fall Time	t_f	-	100	
Total Gate Charge ($V_{DS} = 80\text{V}, I_D = 30\text{A}, V_{GS} = 10\text{V}$)	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 ($I_S = 30\text{A}, V_{GS} = 0$)	V_{SD}	-	2.2	Vdc
Forward Turn-On Time	t_{on}	Limited By Stray Inductance	-	
Reverse Recovery Time	t_r	200 (Typ)	-	ns

*Pulse Test: Pulse Width = 300 μs , Duty Cycle $\leq 2\%$.ELECTRICAL CHARACTERISTICS: Per MOSFET
OM6220SP1 (200V) ($T_C = 25^\circ\text{C}$ unless otherwise noted)

Characteristic	Symbol	Min.	Max.	Units
OFF CHARACTERISTICS				
Drain-Source Breakdown Voltage ($V_{GS} = 0, I_D = 0.25\text{mA}$)	$V_{DS(BR)}$	200	-	Vdc
Zero Gate Voltage Drain Current ($V_{DS} = \text{Rated } V_{DS}, V_{GS} = 0$)	I_{DSS}	-	0.2	mA
($V_{DS} = \text{Rated } V_{DS}, V_{GS} = 0, T_J = 125^\circ\text{C}$)		-	1	
Gate-Body Leakage Current, Forward ($V_{GS} = 20\text{ Vdc}, V_{DS} = 0$)	I_{GSSF}	-	100	nA
Gate-Body Leakage Current, Reverse ($V_{GS} = 20\text{ Vdc}, V_{DS} = 0$)	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 ($V_{GS} = 10\text{ Vdc}, I_D = 16\text{ A}$)	$r_{DS(on)}$	-	0.1	Ohm
Drain-Source-On-Voltage ($V_{GS} = 10\text{ V}$) ($I_D = 25\text{ A}$)	$V_{DS(on)}$	-	3.5	Vdc
($I_D = 16\text{ A}$, $T_J = 100^\circ\text{C}$)		-	3.2	
Forward Transconductance ($V_{DS} = 15\text{ V}, I_D = 16\text{ A}$)	g_{FS}	10	-	mhos

DYNAMIC CHARACTERISTICS

Input Capacitance ($V_{DS} = 25\text{V}, V_{GS} = 0, f = 1\text{MHz}$)	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 ($V_{DS} = 100\text{V}, I_D = 25\text{A}, V_{GS} = 10\text{V}$)	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 ($I_S = 25\text{A}, V_{GS} = 0$)	V_{SD}	-	2	Vdc
Forward Turn-On Time	t_{on}	Limited By Stray Inductance	-	
Reverse Recovery Time	t_r	200 (Typ)	-	ns

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

**ELECTRICAL CHARACTERISTICS: Per MOSFET
OM6221SP1 (500V)** ($T_C = 25^\circ$ unless otherwise noted)

Characteristic	Symbol	Min.	Max.	Units
OFF CHARACTERISTICS				
Drain-Source Breakdown Voltage ($V_{GS} = 0, I_D = 0.25\text{mA}$)	V_{BRDSS}	500	-	Vdc
Zero Gate Voltage Drain Current ($V_{DS} = \text{Rated } V_{DSS}, V_{GS} = 0$) ($V_{DS} = \text{Rated } V_{DSS}, V_{GS} = 0, T_J = 125^\circ\text{C}$)	I_{DSS}	-	0.2 1	mAdc
Gate-Body Leakage Current, Forward ($V_{GS} = 20\text{ Vdc}, V_{DS} = 0$)	I_{GSSF}	-	100	nAdc
Gate-Body Leakage Current, Reverse ($V_{GS} = 20\text{ Vdc}, V_{DS} = 0$)	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 ($V_{GS} = 10\text{ V}$) ($I_D = 12\text{ Adc}$) ($I_D = 7\text{ Adc}, T_J = 100^\circ\text{C}$)	$V_{DS(on)}$	-	6 5.4	Vdc
Forward Transconductance ($V_{DS} = 15\text{ V}, I_D = 7\text{A}$)	g_{FS}	4	-	mhos
DYNAMIC CHARACTERISTICS				
Input Capacitance ($V_{DS} = 25\text{V}, V_{GS} = 0, f = 1\text{MHz}$)	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 ($V_{DS} = 250\text{V}, I_D = 7\text{A}, R_{\theta JA} = 4.7\text{ Ohms}$)	$t_{d(on)}$	-	40	ns
Rise Time	t_r	-	65	-
Turn-Off Delay Time	$t_{d(off)}$	-	150	-
Fall Time	t_f	-	80	-
Total Gate Charge ($V_{DS} = 250\text{V}, I_D = 12\text{A}, V_{GS} = 10\text{V}$)	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 ($I_S = 12\text{A}, V_{GS} = 0$)	V_{SD}	1.1 (Typ)	2	Vdc
Forward Turn-On Time	t_{on}	Limited By Stray Inductance	-	-
Reverse Recovery Time	t_r	1200 (Typ)	-	ns

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

**ELECTRICAL CHARACTERISTICS: Per MOSFET
OM6222SP1 (1000V)** ($T_C = 25^\circ$ unless otherwise noted)

Characteristic	Symbol	Min.	Max.	Units
OFF CHARACTERISTICS				
Drain-Source Breakdown Voltage ($V_{GS} = 0, I_D = 0.25\text{mA}$)	V_{BRDSS}	1000	-	Vdc
Zero Gate Voltage Drain Current ($V_{DS} = \text{Rated } V_{DSS}, V_{GS} = 0$) ($V_{DS} = \text{Rated } V_{DSS}, V_{GS} = 0, T_J = 125^\circ\text{C}$)	I_{DSS}	-	0.2 1	mAdc
Gate-Body Leakage Current, Forward ($V_{GS} = 20\text{ Vdc}, V_{DS} = 0$)	I_{GSSF}	-	100	nAdc
Gate-Body Leakage Current, Reverse ($V_{GS} = 20\text{ Vdc}, V_{DS} = 0$)	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	Ohm
Drain-Source-On-Voltage ($V_{GS} = 10\text{ V}$) ($I_D = 4\text{ Adc}$) ($I_D = 2.5\text{ Adc}, T_J = 100^\circ\text{C}$)	$V_{DS(on)}$	-	15 12.5	Vdc
Forward Transconductance ($V_{DS} = 15\text{ V}, I_D = 2.5\text{A}$)	g_{FS}	2	-	mhos
DYNAMIC CHARACTERISTICS				
Input Capacitance ($V_{DS} = 25\text{V}, V_{GS} = 0, f = 1\text{MHz}$)	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 ($V_{DS} = 250\text{V}, I_D = 2.5\text{A}, R_{\theta JA} = 4.7\text{ Ohms}$)	$t_{d(on)}$	-	40	ns
Rise Time	t_r	-	60	-
Turn-Off Delay Time	$t_{d(off)}$	-	160	-
Fall Time	t_f	-	80	-
Total Gate Charge ($V_{DS} = 400\text{V}, I_D = 4\text{A}, V_{GS} = 10\text{V}$)	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 ($I_S = 4\text{A}, V_{GS} = 0$)	V_{SD}	-	1.6	Vdc
Forward Turn-On Time	t_{on}	Limited By Stray Inductance	-	-
Reverse Recovery Time	t_r	1.2 (Typ)	-	μ s

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

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

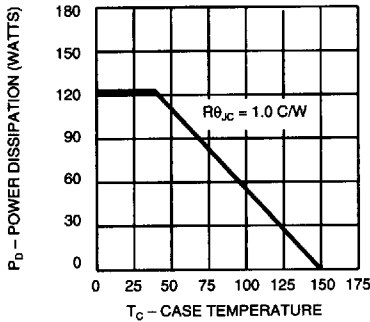
	Parameter	OM6219	OM6220	OM6221	OM6222	Units
V _{DS}	Drain-Source Voltage	100	200	500	1000	V
V _{DGR}	Drain-Gate Voltage (R _{GS} = 1MΩ)	100	200	500	1000	V
I _D @ T _C = 25°C	Continuous Drain Current	30	25	12	4	A
V _{GS}	Continuous Gate-Source Voltage	±20	±20	±20	±20	V
V _{GSM}	Gate-Source Voltage					
	Non-Repetitive (t _p ≤ 50μs)	±40	±40	±40	±40	V
I _{DM}	Pulsed Drain Current ¹	90	50	55	12	A
P _D @ T _C = 25°C	Max. Power Dissipation	125	125	125	125	W
P _D @ T _C = 100°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/°C
Junction to Ambient	Linear Derating Factor	.025	.025	.025	.025	W/°C
T _J	Operating and	-65 to	-65 to	-65 to	-65 to	
T _{stg}	Storage Temperature Range	125	125	125	125	°C
Lead Temperature	(1/8" from case for 5 seconds)	225	225	225	225	°C

¹ Pulse Test: Pulse Width ≤ 300μsec, Duty Cycle ≤ 2%.

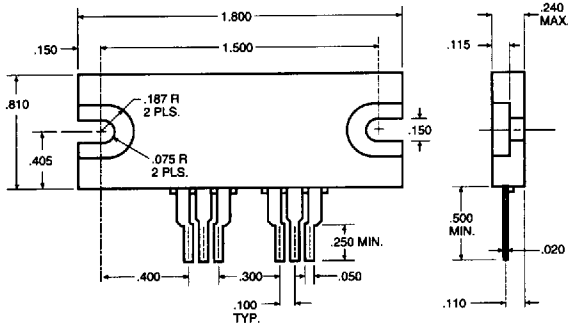
THERMAL RESISTANCE (MAXIMUM) at T_A = 25°C

R _{θJC}	Junction-to-Case	1.0	°C/W
R _{θJA}	Junction-to-Ambient	40	°C/W Free Air Operation

POWER DERATING



MECHANICAL OUTLINE



All Dimensions are ±.010 Unless Otherwise Specified.

2.1-100