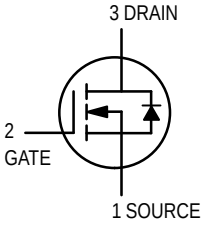
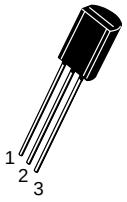
TMOS FET Transistors

N–Channel — Enhancement



MPF6659
MPF6660
MPF6661



CASE 29–05, STYLE 22
TO–92 (TO–226AE)

MAXIMUM RATINGS

Rating	Symbol	MPF6659	MPF6660	MPF6661	Unit
Drain–Source Voltage	V_{DS}	35	60	90	Vdc
Drain–Gate Voltage	V_{DG}	35	60	90	Vdc
Gate–Source Voltage — Continuous — Non–repetitive ($t_p \leq 50$ μs)	 V_{GS} V_{GSM}	 ±20 ±40			 Vdc Vpk
Drain Current Continuous(1) Pulsed(2)	 I_D I_{DM}	 2.0 3.0			Adc
Total Device Dissipation @ T_C = 25°C Derate above 25°C	P_D	 2.5 20			 Watts mW/°C
Total Device Dissipation @ T_A = 25°C Derate above 25°C	P_D	 1.0 8.0			 Watts mW/°C
Operating and Storage Junction Temperature Range	T_J, T_{stg}	–55 to +150			°C

ELECTRICAL CHARACTERISTICS (T_A = 25°C unless otherwise noted)

Characteristic		Symbol	Min	Typ	Max	Unit
OFF CHARACTERISTICS						
Zero–Gate–Voltage Drain Current (V_{DS} = Maximum Rating, V_{GS} = 0)		I_{DSS}	—	—	10	μAdc
Gate–Body Leakage Current (V_{GS} = 15 Vdc, V_{DS} = 0)		I_{GSS}	—	—	100	nAdc
Drain–Source Breakdown Voltage (V_{GS} = 0, I_D = 10 μAdc)	 MPF6659 MPF6660 MPF6661	$V_{(BR)DSX}$	 35 60 90	 — — —	 — — —	Vdc
ON CHARACTERISTICS(2)						
Gate Threshold Voltage (V_{DS} = V_{GS}, I_D = 1.0 mAdc)		$V_{GS(Th)}$	0.8	1.4	2.0	Vdc
Drain–Source On–Voltage (V_{GS} = 10 Vdc, I_D = 1.0 Adc) (V_{GS} = 5.0 Vdc, I_D = 0.3 Adc)	 MPF6659 MPF6660 MPF6661 MPF6659 MPF6660 MPF6661	$V_{DS(on)}$	 — — — — — —	 — — — 0.8 0.9 0.9	 1.8 3.0 4.0 1.5 1.5 1.6	Vdc

1. The Power Dissipation of the package may result in a lower continuous drain current.
2. Pulse Test: Pulse Width ≤ 300 μs, Duty Cycle ≤ 2.0%.

REV 2

ELECTRICAL CHARACTERISTICS (T_A = 25°C unless otherwise noted) (Continued)

Characteristic		Symbol	Min	Typ	Max	Unit
ON CHARACTERISTICS(2) (Continued)						
Static Drain–Source On Resistance (V_{GS} = 10 Vdc, I_D = 1.0 Adc)	MPF6659	$r_{DS(on)}$	—	—	1.8	Ω
	MPF6660		—	—	3.0	
	MPF6661		—	—	4.0	
On–State Drain Current (V_{DS} = 25 Vdc, V_{GS} = 10 Vdc)		$I_{D(on)}$	1.0	2.0	—	Amps
SMALL–SIGNAL CHARACTERISTICS						
Input Capacitance (V_{DS} = 25 Vdc, V_{GS} = 0, f = 1.0 MHz)		C_{iss}	—	30	—	pF
Reverse Transfer Capacitance (V_{DS} = 25 Vdc, V_{GS} = 0, f = 1.0 MHz)		C_{rss}	—	3.6	—	pF
Output Capacitance (V_{DS} = 25 Vdc, V_{GS} = 0, f = 1.0 MHz)		C_{oss}	—	20	—	pF
Forward Transconductance (V_{DS} = 25 Vdc, I_D = 0.5 Adc)		g_{fs}	170	—	—	mmhos
SWITCHING CHARACTERISTICS(2)						
Rise Time		t_r	—	—	5.0	ns
Fall Time		t_f	—	—	5.0	ns
Turn–On Time		t_{on}	—	—	5.0	ns
Turn–Off Time		t_{off}	—	—	5.0	ns

2. Pulse Test: Pulse Width ≤ 300 μs, Duty Cycle ≤ 2.0%.

RESISTIVE SWITCHING

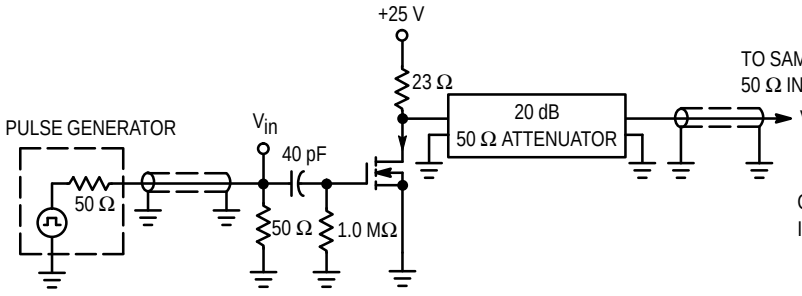


Figure 1. Switching Test Circuit

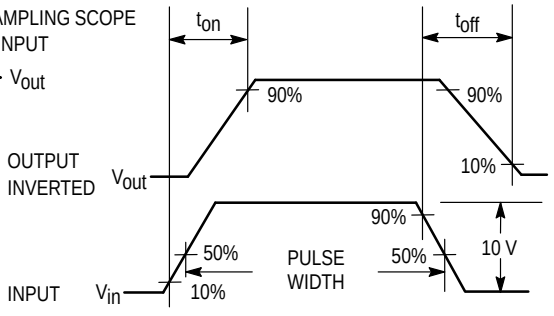


Figure 2. Switching Waveforms

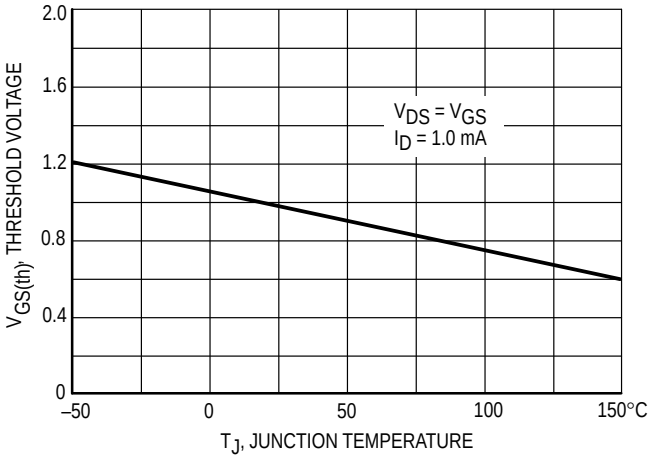


Figure 3. $V_{GS(th)}$ Normalized versus Temperature

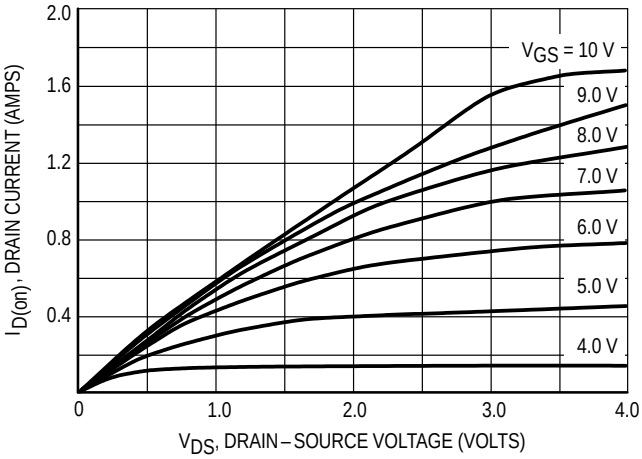


Figure 4. On–Region Characteristics

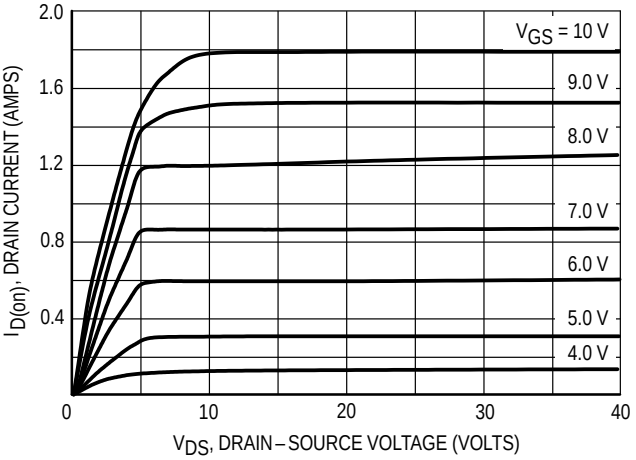


Figure 5. Output Characteristics

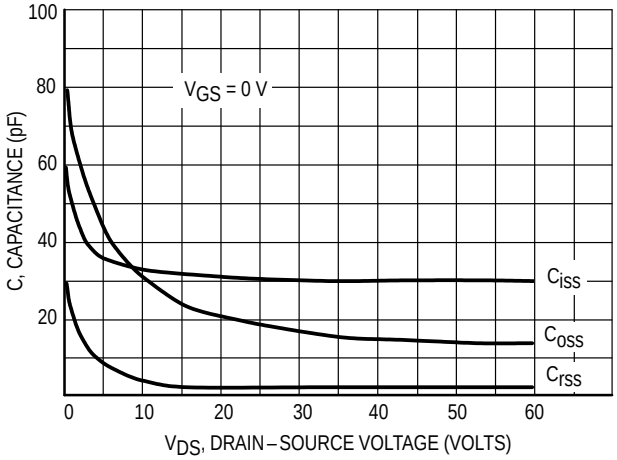


Figure 6. Capacitance versus Drain–To–Source Voltage

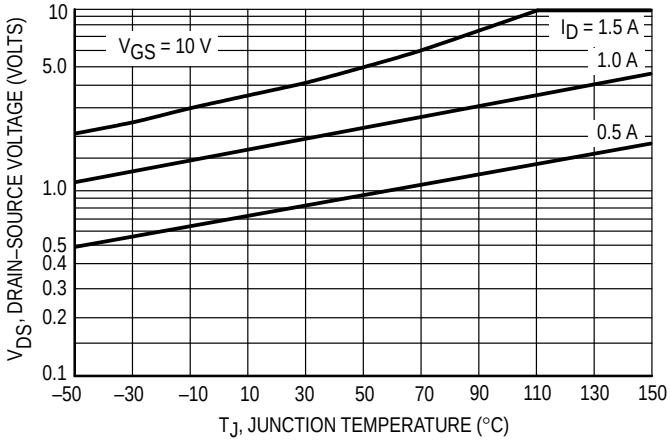
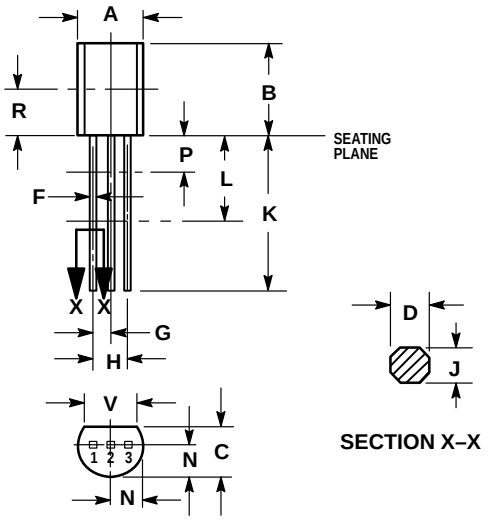


Figure 7. On–Voltage versus Temperature

PACKAGE DIMENSIONS



NOTES:
1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
2. CONTROLLING DIMENSION: INCH.
3. CONTOUR OF PACKAGE BEYOND DIMENSION R IS UNCONTROLLED.
4. DIMENSION F APPLIES BETWEEN P AND L. DIMENSIONS D AND J APPLY BETWEEN L AND K MIMIMUM. LEAD DIMENSION IS UNCONTROLLED IN P AND BEYOND DIMENSION K MINIMUM.

	INCHES		MILLIMETERS	
DIM	MIN	MAX	MIN	MAX
A	0.175	0.205	4.44	5.21
B	0.290	0.310	7.37	7.87
C	0.125	0.165	3.18	4.19
D	0.018	0.022	0.46	0.56
F	0.016	0.019	0.41	0.48
G	0.045	0.055	1.15	1.39
H	0.095	0.105	2.42	2.66
J	0.018	0.024	0.46	0.61
K	0.500	—	12.70	—
L	0.250	—	6.35	—
N	0.080	0.105	2.04	2.66
P	—	0.100	—	2.54
R	0.135	—	3.43	—
V	0.135	—	3.43	—

STYLE 22:
PIN 1. SOURCE
2. GATE
3. DRAIN

CASE 029–05
(TO–226AE)
ISSUE AD

How to reach us:
USA / EUROPE / Locations Not Listed: Motorola Literature Distribution; P.O. Box 5405, Denver, Colorado 80217. 303–675–2140 or 1–800–441–2447

Mfax™: RMFAX0@email.sps.mot.com – TOUCHTONE 602–244–6609
INTERNET: http://Design–NET.com

JAPAN: Nippon Motorola Ltd.; Tatsumi–SPD–JLDC, 6F Seibu–Butsuryu–Center, 3–14–2 Tatsumi Koto–Ku, Tokyo 135, Japan. 81–3–3521–8315

ASIA / PACIFIC: Motorola Semiconductors H.K. Ltd.; 8B Tai Ping Industrial Park, 51 Ting Kok Road, Tai Po, N.T., Hong Kong. 852–26629298