TEMIC
Semiconductors

2N7079

P-Channel Enhancement-Mode Transistor
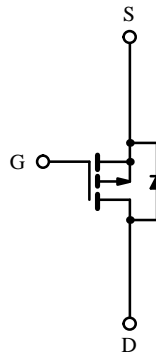
Product Summary

$V_{(BR)DSS}$ (V)	$r_{DS(on)}$ (Ω)	I_D (A)
–100	0.210	–17

TO-254AA
Hermetic Package

Case Isolated

D S G
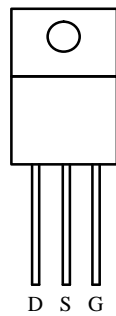
Top View

P-Channel MOSFET

Absolute Maximum Ratings ($T_C = 25°C$ Unless Otherwise Noted)

Parameter		Symbol	Limit	Unit
Drain-Source Voltage		V_{DS}	–100	V
Gate-Source Voltage		V_{GS}	± 20	
Continuous Drain Current ($T_J = 150°C$)	$T_C = 25°C$	I_D	–17	A
	$T_C = 100°C$		–10.8	
Pulsed Drain Current		I_{DM}	–68	
Maximum Power Dissipation	$T_C = 25°C$	P_D	100	W
	$T_C = 100°C$		40	
Operating Junction and Storage Temperature Range		T_J, T_{stg}	–55 to 150	°C
Lead Temperature ($^1/_{16}$" from case for 10 sec.)		T_L	300	

Thermal Resistance Ratings

Parameter	Symbol	Typical	Maximum	Unit
Maximum Junction-to-Ambient	R_{thJA}		50	°C/W
Maximum Junction-to-Case	R_{thJC}		1.25	
Case-to-Sink	R_{thCS}	0.2		

Subsequent updates to this data sheet may be obtained via facsimile by calling Siliconix FaxBack, 1-408-970-5600. Please request FaxBack document #1456 .
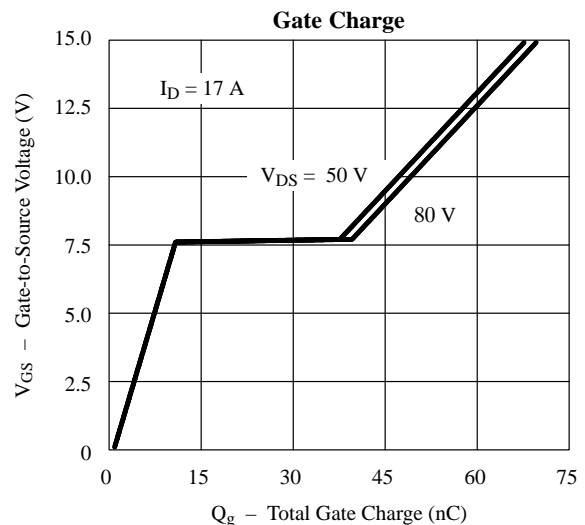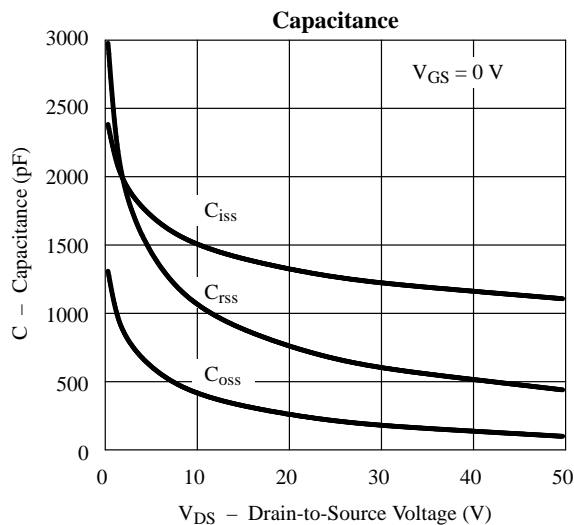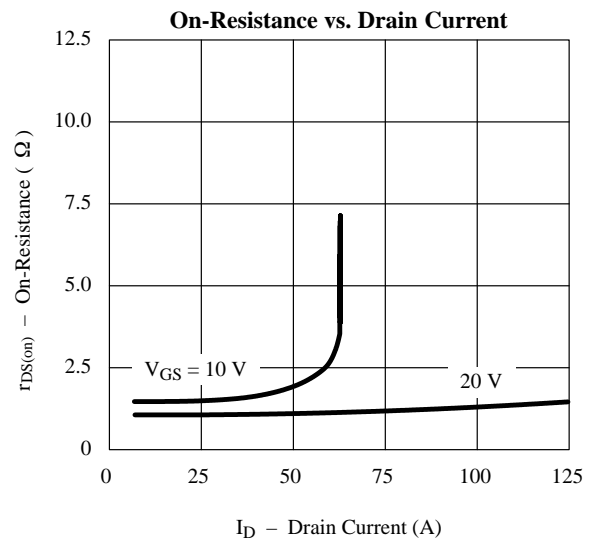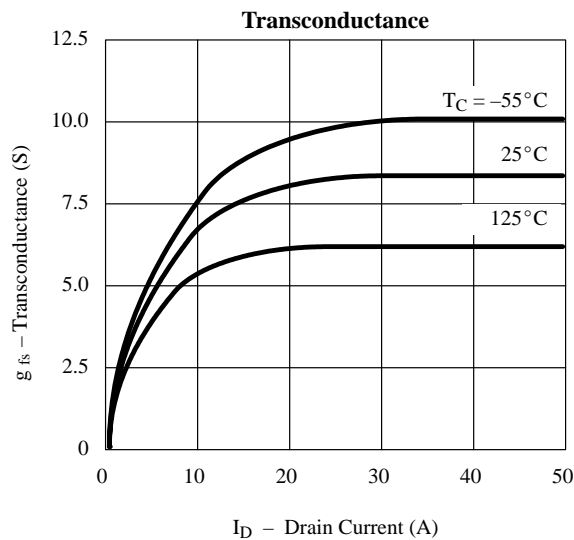
Specifications ($T_J = 25°C$ Unless Otherwise Noted)

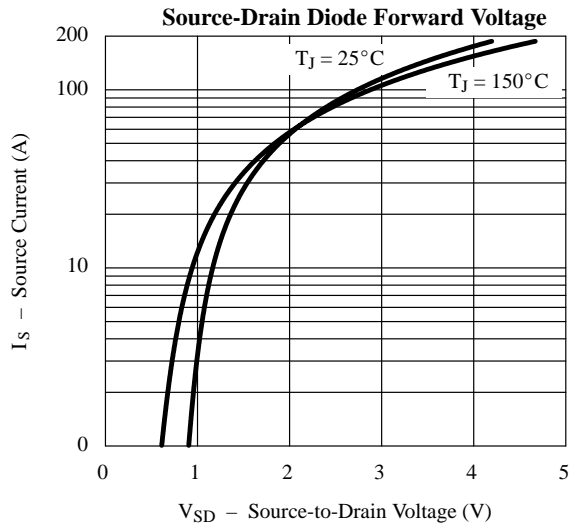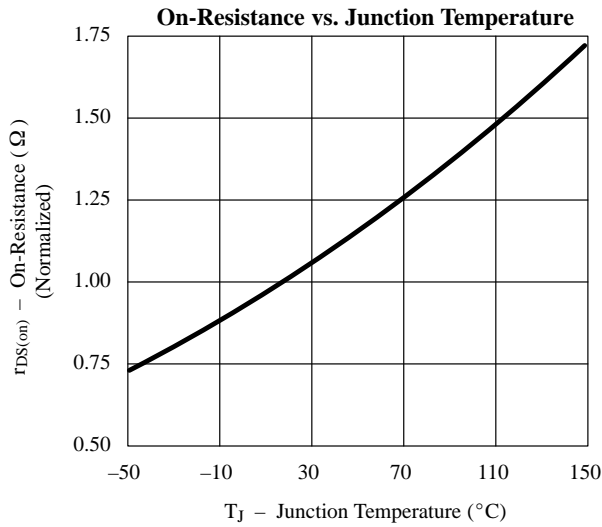| Parameter	Symbol	Test Condition	Min	Typ[a]	Max	Unit
Static						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	$V_{GS} = 0$ V, $I_D = -250$ µA	−100			V
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}$, $I_D = -250$ µA	−2.0		−4.0	
Gate-Body Leakage	I_{GSS}	$V_{DS} = 0$ V, $V_{GS} = \pm 20$ V			± 100	nA
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS} = -80$ V, $V_{GS} = 0$ V			−25	µA
		$V_{DS} = -80$ V, $V_{GS} = 0$ V, $T_J = 125°C$			−250	
On-State Drain Current[b]	$I_{D(on)}$	$V_{DS} = -10$ V, $V_{GS} = -10$ V	−17			A
Drain-Source On-State Resistance[b]	$r_{DS(on)}$	$V_{GS} = -10$ V, $I_D = -10.8$ A		0.14	0.210	Ω
		$V_{GS} = -10$ V, $I_D = -10.8$ A, $T_J = 125°C$		0.22	0.32	
Forward Transconductance[b]	g_{fs}	$V_{DS} = -15$ V, $I_D = -10.8$ A	5.0	5.5		S
Dynamic						
Input Capacitance	C_{iss}	$V_{GS} = 0$ V, $V_{DS} = -25$ V, f = 1 MHz		1300		pF
Output Capacitance	C_{oss}			750		
Reverse Transfer Capacitance	C_{rss}			300		
Total Gate Charge[c]	Q_g	$V_{DS} = -50$ V, $V_{GS} = -10$ V, $I_D = -17$ A		47	60	nC
Gate-Source Charge[c]	Q_{gs}			10	18	
Gate-Drain Charge[c]	Q_{gd}			27	36	
Turn-On Delay Time[c]	$t_{d(on)}$	$V_{DD} = -50$ V, $R_L = 2.7$ Ω		10	30	ns
Rise Time[c]	t_r	$I_D \simeq -17$ A, $V_{GEN} = -10$ V, $R_G = 4.7$ Ω		50	80	
Turn-Off Delay Time[c]	$t_{d(off)}$			25	80	
Fall Time[c]	t_f			15	60	
Source-Drain Diode Ratings and Characteristics						
Continuous Current	I_S				−17	A
Pulsed Current	I_{SM}				−68	
Diode Forward Voltage[b]	V_{SD}	$I_F = -17$ A, $V_{GS} = 0$ V			−2.0	V
Reverse Recovery Time	t_{rr}	$I_F = -17$ A, di/dt = 100 A/µs		150		ns
Reverse Recovery Charge	Q_{rr}			0.3		µC

Notes:
a. For design aid only; not subject to production testing.
b. Pulse test; pulse width $\leq$ 300 µs, duty cycle $\leq$ 2%.
c. Independent of operating temperature.

Typical Characteristics (25°C Unless Otherwise Noted)

Output Characteristics

$V_{GS} = 10$ V

9 V

8 V

7 V

6 V

5 V

4 V

I_D – Drain Current (A)

V_{DS} – Drain-to-Source Voltage (V)

Transfer Characteristics

$T_C = -55°C$

25°C

125°C

I_D – Drain Current (A)

V_{GS} – Gate-to-Source Voltage (V)

Transconductance

$T_C = -55°C$

25°C

125°C

g_{fs} – Transconductance (S)

I_D – Drain Current (A)

On-Resistance vs. Drain Current

$V_{GS} = 10$ V

20 V

$r_{DS(on)}$ – On-Resistance (Ω)

I_D – Drain Current (A)

Capacitance

$V_{GS} = 0$ V

C_{iss}

C_{rss}

C_{oss}

C – Capacitance (pF)

V_{DS} – Drain-to-Source Voltage (V)

Gate Charge

$I_D = 17$ A

$V_{DS} = 50$ V

80 V

V_{GS} – Gate-to-Source Voltage (V)

Q_g – Total Gate Charge (nC)

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Typical Characteristics (25°C Unless Otherwise Noted)

On-Resistance vs. Junction Temperature

Source-Drain Diode Forward Voltage

Thermal Ratings

Maximum Drain Current vs. Case Temperature

Safe Operating Area

Normalized Thermal Transient Impedance, Junction-to-Case