Siliconix

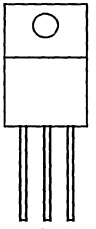
2N7086

N-Channel Enhancement-Mode Transistor

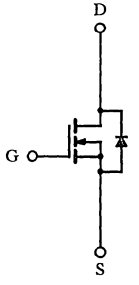
Product Summary

$V_{(BR)DSS}$ (V)	$r_{DS(on)}$ (Ω)	I_D (A)
200	0.16	14

TO-257AB
Hermetic Package



Top View



N-Channel MOSFET

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

Parameter		Symbol	Limit	Unit
Drain-Source Voltage		V_{DS}	200	V
Gate-Source Voltage		V_{GS}	±20	
Continuous Drain Current (T_J = 150°C)	T_C = 25°C	I_D	14	A
	T_C = 100°C		8.5	
Pulsed Drain Current		I_{DM}	56	
Maximum Power Dissipation	T_C = 25°C	P_D	60	W
	T_C = 100°C		23	
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}		80	°C/W
Maximum Junction-to-Case	R_{thJC}		2.1	
Case-to-Sink	R_{thCS}	1.0		

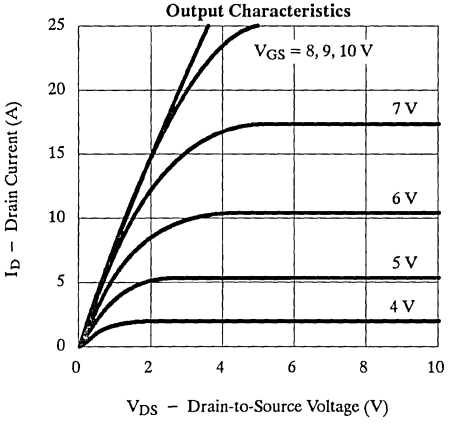
Specifications (T_J = 25°C Unless Otherwise Noted)

Parameter	Symbol	Test Condition	Limit Min	Limit Typ[a]	Limit Max	Unit
Static						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	V_{GS} = 0 V, I_D = 250 µA	200			V
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS} = V_{GS}, I_D = 250 µA	2.0		4 0	V
Gate-Body Leakage	I_{GSS}	V_{DS} = 0 V, V_{GS} = ±20 V			±100	nA
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS} = 160 V, V_{GS} = 0 V			25	µA
		V_{DS} = 160 V, V_{GS} = 0 V, T_J = 125°C			250	µA
On-State Drain Current[b]	$I_{D(on)}$	V_{DS} = 10 V, V_{GS} = 10 V	14			A
Drain-Source On-State Resistance[b]	$r_{DS(on)}$	V_{GS} = 10 V, I_D = 8.5 A		0.14	0.16	Ω
		V_{GS} = 10 V, I_D = 8.5 A, T_J = 125°C		0.25	0.30	Ω
Forward Transconductance[b]	g_{fs}	V_{DS} = 15 V, I_D = 8.5 A	5.0			S
Dynamic						
Input Capacitance	C_{iss}	V_{GS} = 0 V, V_{DS} = 25 V, f = 1 MHz		1550		pF
Output Capacitance	C_{oss}			500		pF
Reverse Transfer Capacitance	C_{rss}			220		pF
Total Gate Charge[c]	Q_g	V_{DS} = 100 V, V_{GS} = 10 V, I_D = 14 A		44	77	nC
Gate-Source Charge[c]	Q_{gs}			10	15	nC
Gate-Drain Charge[c]	Q_{gd}			26	35	nC
Turn-On Delay Time[c]	$t_{d(on)}$	V_{DD} = 100 V, R_L = 7.1 Ω I_D ≃ 14 A, V_{GEN} = 10 V, R_G = 4.7 Ω		10	30	ns
Rise Time[c]	t_r			60	100	ns
Turn-Off Delay Time[c]	$t_{d(off)}$			30	80	ns
Fall Time[c]	t_f			40	95	ns
Source-Drain Diode Ratings and Characteristics						
Continuous Current	I_S				14	A
Pulsed Current	I_{SM}				56	A
Diode Forward Voltage[b]	V_{SD}	I_F = 14 A, V_{GS} = 0 V			2.0	V
Reverse Recovery Time	t_{rr}	I_F = 14 A, di/dt = 100 A/µs		150	650	ns
Reverse Recovery Charge	Q_{rr}			0.5		µC

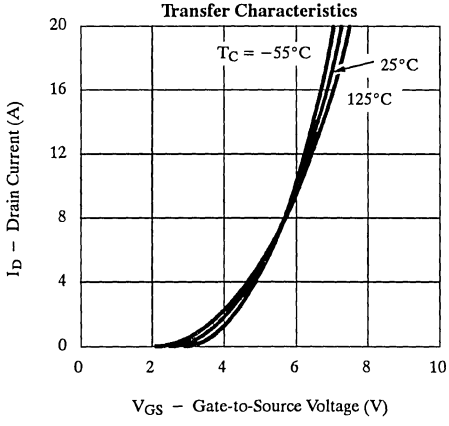
Notes:
a. For design aid only; not subject to production testing.
b. Pulse test; pulse width ≤ 300 µs, duty cycle ≤ 2%.
c. Independent of operating temperature.

Typical Characteristics (25°C Unless Otherwise Noted)

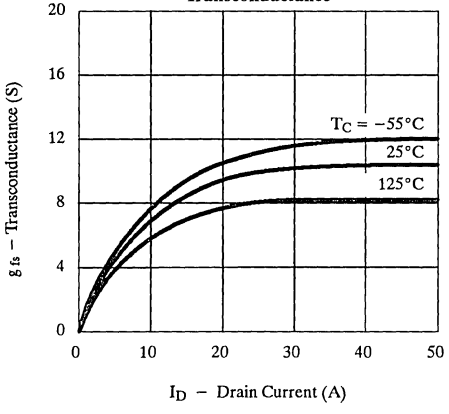
Output Characteristics



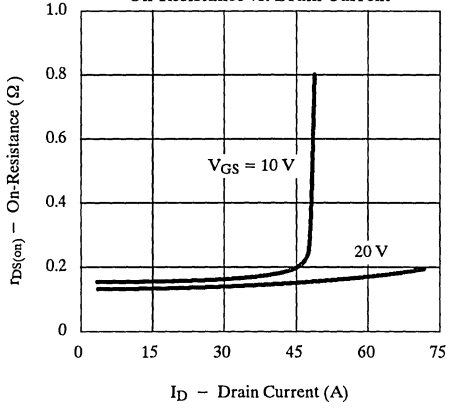
Transfer Characteristics



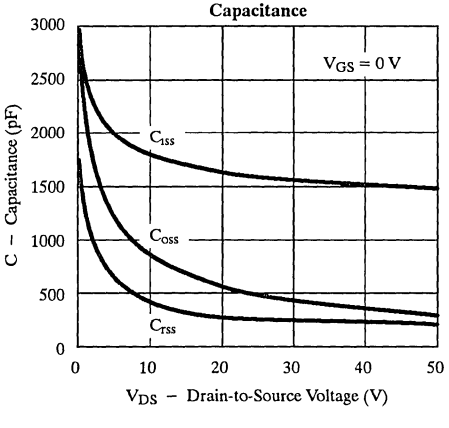
Transconductance



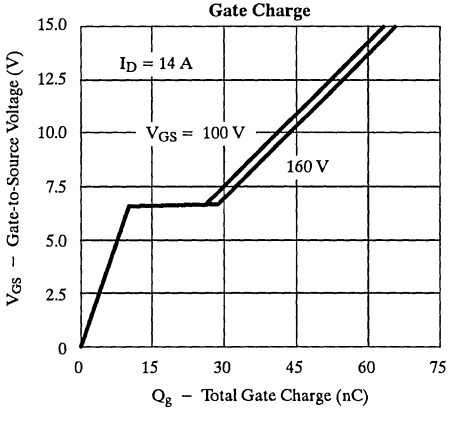
On-Resistance vs. Drain Current



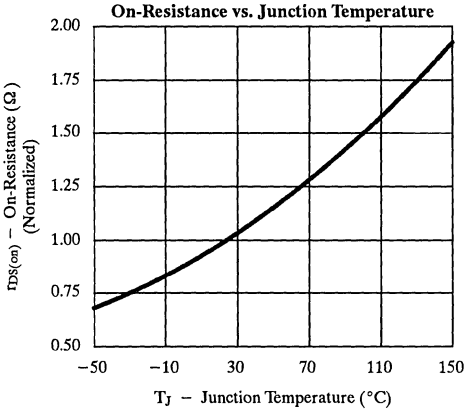
Capacitance

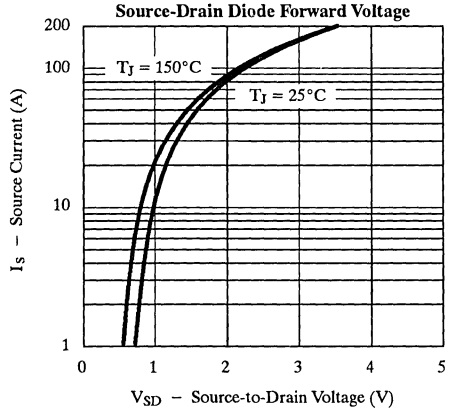


Gate Charge



Typical Characteristics (25°C Unless Otherwise Noted)





Thermal Ratings