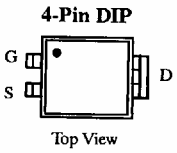
Siliconix

IRFD020

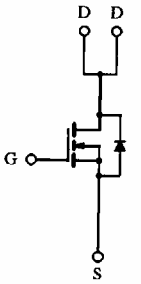
N-Channel Enhancement-Mode Transistor

Product Summary

$V_{(BR)DSS}$ (V)	$r_{DS(on)}$ (Ω)	I_D (A)
50	0.10	2.4



Top View



N-Channel MOSFET

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

Parameter		Symbol	Limit	Unit
Drain-Source Voltage		V_{DS}	50	V
Gate-Source Voltage		V_{GS}	±20	
Continuous Drain Current	T_A = 25°C	I_D	2.4	A
	T_A = 100°C		1.5	
Pulsed Drain Current		I_{DM}	19	
Power Dissipation	T_A = 25°C	P_D	1.0	W
	T_A = 100°C		0.40	
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	Maximum	Unit
Junction-to-Ambient	R_{thJA}	120	°C/W

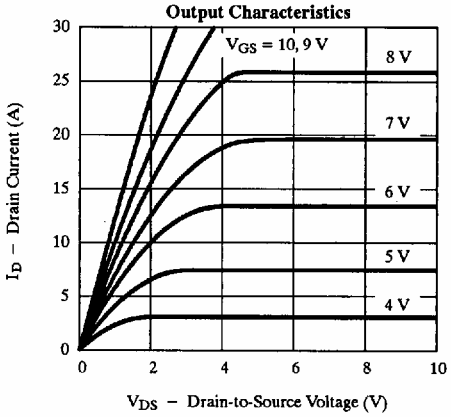
Specifications (T_J = 25°C Unless Otherwise Noted)

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	50			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} = ±20 V			±500	nA
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS} = 40 V, V_{GS} = 0 V			250	µA
		V_{DS} = 40 V, V_{GS} = 0 V, T_J = 125°C			1000	
On-State Drain Current[b]	$I_{D(on)}$	V_{DS} = 2 V, V_{GS} = 10 V	2.4			A
Drain-Source On-State Resistance[b]	$r_{DS(on)}$	V_{GS} = 10 V, I_D = 1.4 A		0.08	0.10	Ω
		V_{GS} = 10 V, I_D = 1.4 A, T_J = 125°C		0.16	0.18	
Forward Transconductance[b]	g_{fs}	V_{DS} = 15 V, I_D = 7.5 A	4.9	5.5		S
Dynamic						
Input Capacitance	C_{iss}	V_{GS} = 0 V, V_{DS} = 25 V, f = 1 MHz		550	850	pF
Output Capacitance	C_{oss}			300	350	
Reverse Transfer Capacitance	C_{rss}			80	100	
Total Gate Charge[c]	Q_g	V_{DS} = 25 V, V_{GS} = 10 V, I_D = 15 A		13	24	nC
Gate-Source Charge[c]	Q_{gs}			3.5		
Gate-Drain Charge[c]	Q_{gd}			5		
Turn-On Delay Time[c]	$t_{d(on)}$	V_{DD} = 25 V, R_L = 1.7 Ω I_D ≃ 15 A, V_{GEN} = 10 V, R_G = 18 Ω		10	13	ns
Rise Time[c]	t_r			60	83	
Turn-Off Delay Time[c]	$t_{d(off)}$			30	40	
Fall Time[c]	t_f			35	50	
Source-Drain Diode Ratings and Characteristics (T_A = 25°C)						
Continuous Current	I_S				2.4	A
Pulsed Current	I_{SM}				19	
Forward Voltage[b]	V_{SD}	I_F = 2.4 A, V_{GS} = 0 V			1.25	V
Reverse Recovery Time	t_{rr}	I_F = 2.4 A, dI_F/dt = 100 A/µs		65		ns
Reverse Recovery Charge	Q_{rr}			0.16	0.85	µC

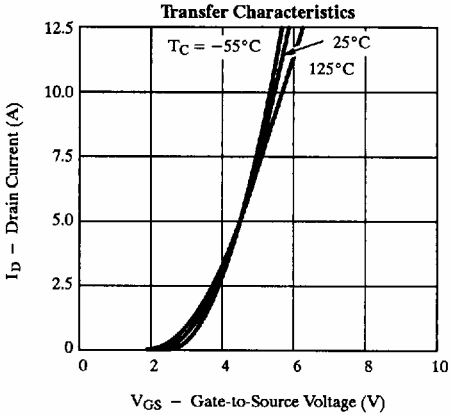
Notes:
a. For design aid only; not subject to production testing.
b. Pulse test; pulse width ≤ 300 µs, duty cycle ≤ 2%.
c. Independent of operating temperature.

Typical Characteristics (25°C Unless Otherwise Noted)

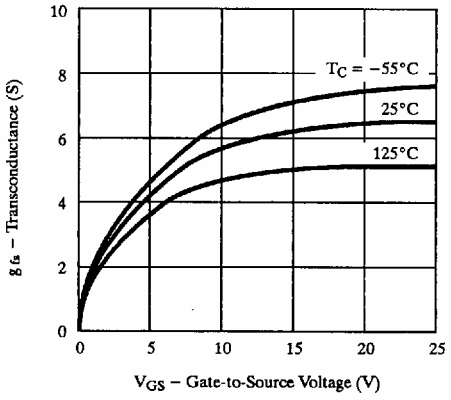
Output Characteristics



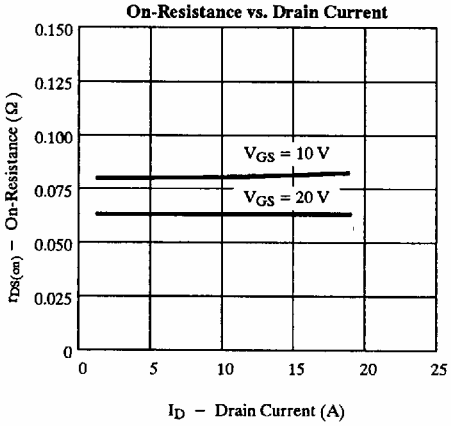
Transfer Characteristics



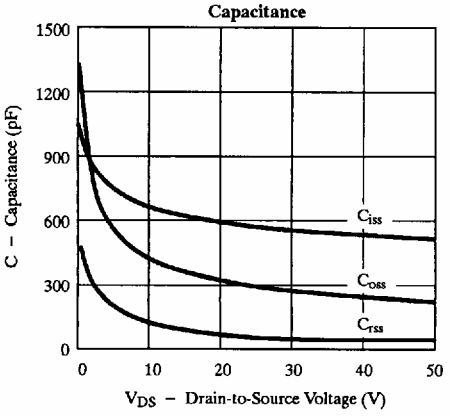
Transconductance



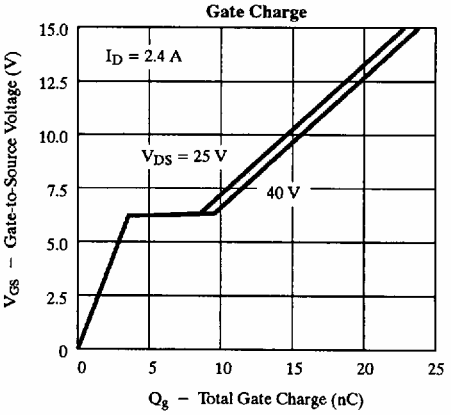
On-Resistance vs. Drain Current



Capacitance



Gate Charge



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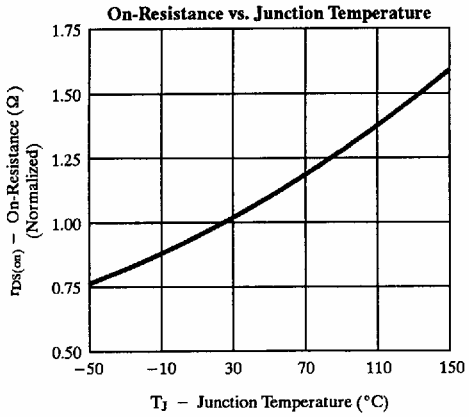

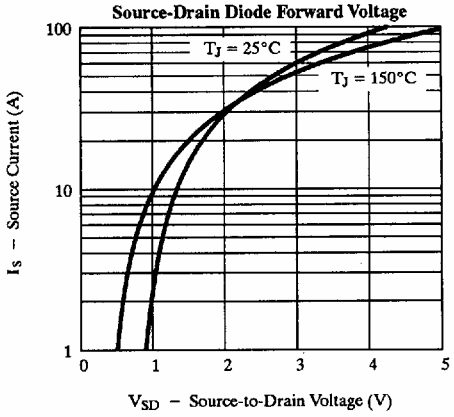

Thermal Ratings