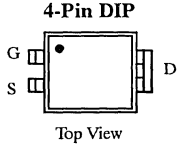
Siliconix

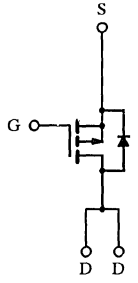
IRFD9120/9123

P-Channel Enhancement-Mode Transistors

Product Summary

Part Number	$V_{(BR)DSS}$ (V)	$r_{DS(on)}$ (Ω)	I_D (A)
IRFD9120	−100	0.60	−1.0
IRFD9123	−60	0.80	−0.8





P-Channel MOSFET

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

Parameter		Symbol	IRFD9120	IRFD9123	Unit
Drain-Source Voltage		V_{DS}	−100	−60	V
Gate-Source Voltage		V_{GS}	±20	±20	
Continuous Drain Current	T_A = 25°C	I_D	−1.0	−0.8	A
	T_A = 100°C		−0.6	−0.5	
Pulsed Drain Current		I_{DM}	−8.0	−6.4	
Power Dissipation	T_A = 25°C	P_D	1.0	1.0	W
	T_A = 100°C		0.4	0.4	
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)

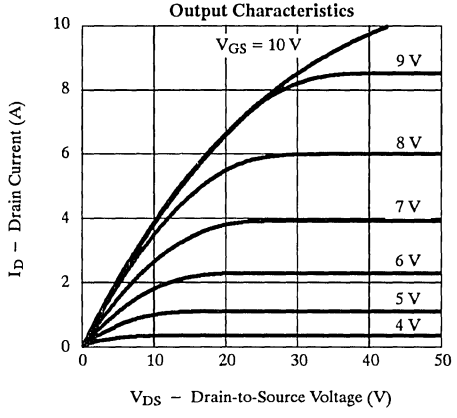
Parameter	Symbol	Test Condition		Min	Typ[a]	Max	Unit
Static							
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	V_{GS} = 0 V, I_D = −250 µA	IRFD9120	−100			V
			IRFD9123	−60			
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS} = V_{GS}, I_D = −250 µA		−2.0		−4.0	
Gate-Body Leakage	I_{GSS}	V_{DS} = 0 V, V_{GS} = ±20 V				±500	nA
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS} = $V_{(BR)DSS}$, V_{GS} = 0 V				−250	µA
		V_{DS} = 0.8 x $V_{(BR)DSS}$, V_{GS} = 0 V, T_J = 125°C				−1000	
On-State Drain Current[b]	$I_{D(on)}$	V_{DS} = −10 V, V_{GS} = −10 V	IRFD9120	−1.0			A
			IRFD9123	−0.8			
Drain-Source On-State Resistance[b]	$r_{DS(on)}$	V_{GS} = −10 V, I_D = −0.8 A	IRFD9120		0.50	0.60	Ω
			IRFD9123		0.60	0.80	
		V_{GS} = −10 V, I_D = −0.8 A, T_J = 125°C	IRFD9120		0.80	1.0	
			IRFD9123		1.00	1.4	
Forward Transconductance[b]	g_{fs}	V_{DS} = −15 V, I_D = −0.8 A		0.8	1.0		S
Dynamic							
Input Capacitance	C_{iss}	V_{GS} = 0 V, V_{DS} = −25 V, f = 1 MHz			350	450	pF
Output Capacitance	C_{oss}				205	350	
Reverse Transfer Capacitance	C_{rss}				80	100	
Total Gate Charge[c]	Q_g	V_{DS} = −50 V, V_{GS} = 10 V, I_D = −4 A			9	20	nC
Gate-Source Charge[c]	Q_{gs}				1.8		
Gate-Drain Charge[c]	Q_{gd}				5.6		
Turn-On Delay Time[c]	$t_{d(on)}$	V_{DD} = −50 V, R_L = 62 Ω, $I_D \simeq$ −0.8 A, V_{GEN} = −10 V, R_G = 25 Ω			9	50	ns
Rise Time[c]	t_r				25	100	
Turn-Off Delay Time[c]	$t_{d(off)}$				30	100	
Fall Time[c]	t_f				30	100	
Source-Drain Diode Ratings and Characteristics (T_A = 25°C)							
Continuous Current	I_S		IRFD9120			−1.0	A
			IRFD9123			−0.8	
Pulsed Current	I_{SM}		IRFD9120			−8.0	
			IRFD9123			−6.4	
Forward Voltage[b]	V_{SD}	I_F = I_S, V_{GS} = 0 V	IRFD9120			−6.3	V
			IRFD9123			−6.0	
Reverse Recovery Time	t_{rr}	I_F = I_S, dI_F/dt = 100 A/µs			80		ns
Reverse Recovery Charge	Q_{rr}				0.18		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.

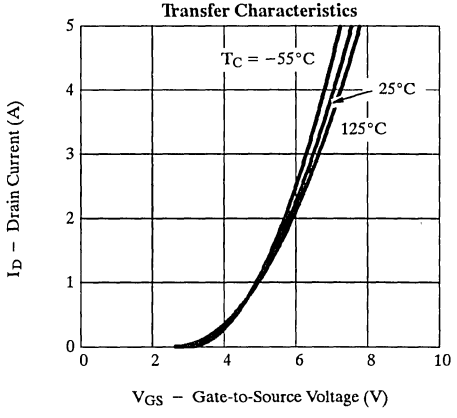
Typical Characteristics (25°C Unless Otherwise Noted)

Negative signs omitted for clarity.

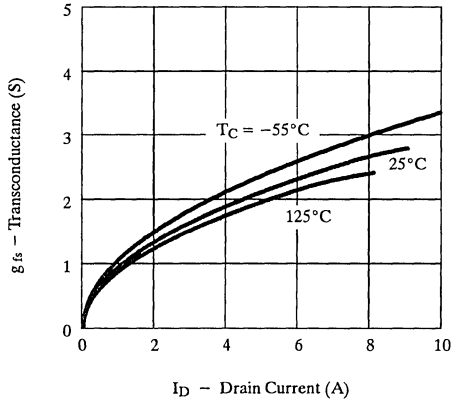
Output Characteristics



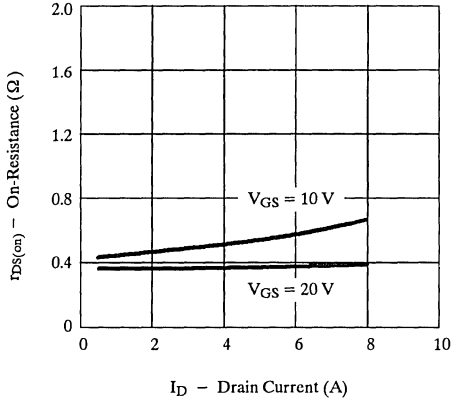
Transfer Characteristics



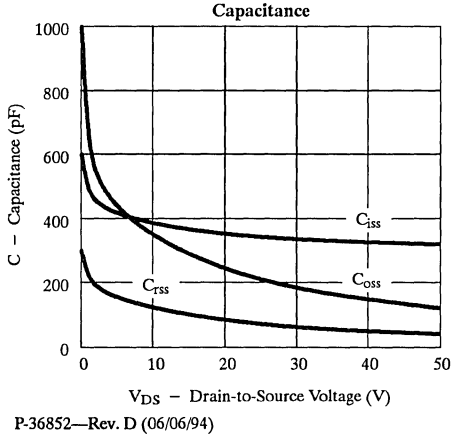
Transconductance



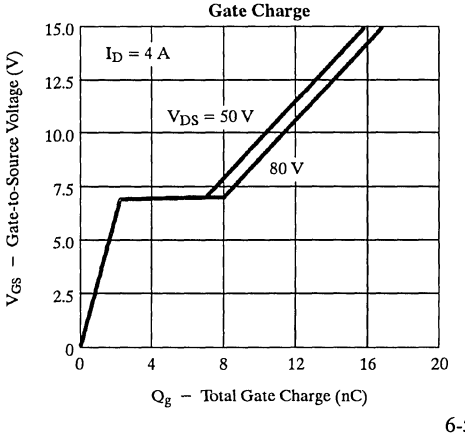
On-Resistance vs. Drain Current



Capacitance



Gate Charge



Typical Characteristics (25°C Unless Otherwise Noted)

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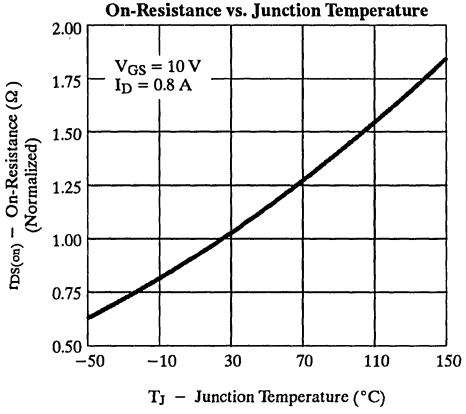

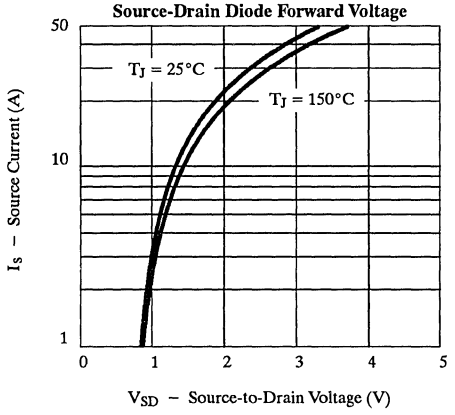

Thermal Ratings