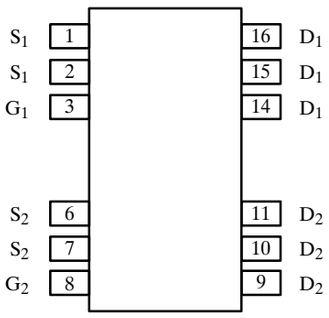
Si9940DY

Dual N-Channel Enhancement-Mode MOSFET

Product Summary

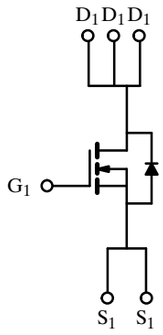
V_{DS} (V)	$r_{DS(on)}$ (Ω)	I_D (A)
50	0.05 @ V_{GS} = 10 V	±5.3
	0.07 @ V_{GS} = 4.5 V	±4.5

SO-16*

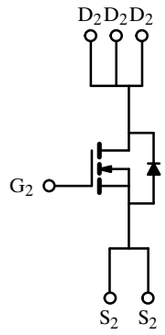


Top View

*Conforms to standard SO-16 dimensions



N-Channel MOSFET



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_J = 150°C)[a]	T_A = 25°C	I_D	±5.3	A
	T_A = 70°C		±4.2	
Pulsed Drain Current		I_{DM}	±20	
Continuous Source Current (Diode Conduction)[a]		I_S	2.5	
Maximum Power Dissipation[a]	T_A = 25°C	P_D	2.5	W
	T_A = 70°C		1.6	
Operating Junction and Storage Temperature Range		T_J, T_{stg}	−55 to 150	°C

Thermal Resistance Ratings

Parameter	Symbol	Limit	Unit
Maximum Junction-to-Ambient[a]	R_{thJA}	50	°C/W

Notes
a. Surface Mounted on FR4 Board, t ≤ 10 sec.

Subsequent updates to this data sheet may be obtained via facsimile by calling Siliconix FaxBack, 1-408-970-5600. Please request FaxBack document #1211.

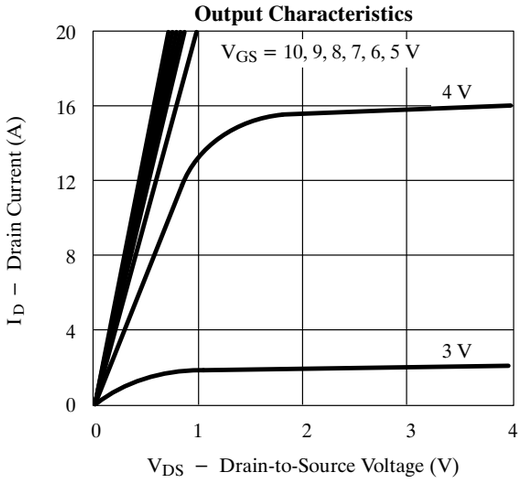
Specifications (T_J = 25°C Unless Otherwise Noted)

Parameter	Symbol	Test Condition	Min	Typ[a]	Max	Unit
Static						
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS} = V_{GS}, I_D = 250 µA	1.0			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} = 40 V, V_{GS} = 0 V			2	µA
		V_{DS} = 40 V, V_{GS} = 0 V, T_J = 55°C			25	
On-State Drain Current[b]	$I_{D(on)}$	V_{DS} ≥ 5 V, V_{GS} = 10 V	20			A
Drain-Source On-State Resistance[b]	$r_{DS(on)}$	V_{GS} = 10 V, I_D = 5.3 A		0.042	0.05	Ω
		V_{GS} = 4.5 V, I_D = 4.5 A		0.055	0.07	
Forward Transconductance[b]	g_{fs}	V_{DS} = 15 V, I_D = 5.3 A		11		S
Diode Forward Voltage[b]	V_{SD}	I_S = 1.5 A, V_{GS} = 0 V		0.8	1.2	V
Dynamic[a]						
Total Gate Charge	Q_g	V_{DS} = 25 V, V_{GS} = 10 V, I_D = 2 A		30	50	nC
Gate-Source Charge	Q_{gs}			2.5		
Gate-Drain Charge	Q_{gd}			9.4		
Turn-On Delay Time	$t_{d(on)}$	V_{DD} = 25 V, R_L = 25 Ω I_D ≅ 1 A, V_{GEN} = 10 V, R_G = 6 Ω		17	40	ns
Rise Time	t_r			30	60	
Turn-Off Delay Time	$t_{d(off)}$			95	150	
Fall Time	t_f			55	100	
Source-Drain Reverse Recovery Time	t_{rr}	I_F = 1.5 A, di/dt = 100 A/µs		130		

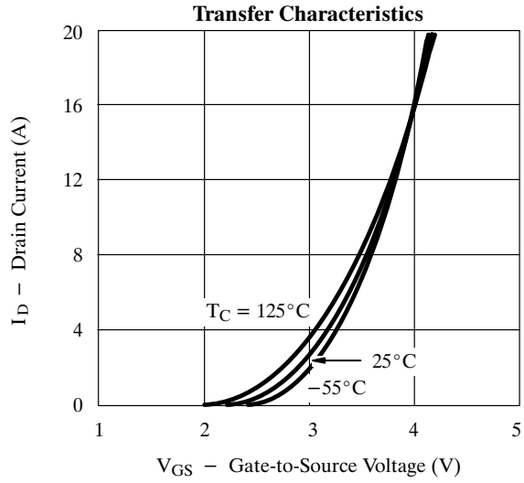
Notes
a. Guaranteed by design, not subject to production testing.
b. Pulse test; pulse width ≤ 300 µs, duty cycle ≤ 2%.

Typical Characteristics (25°C Unless Otherwise Noted)

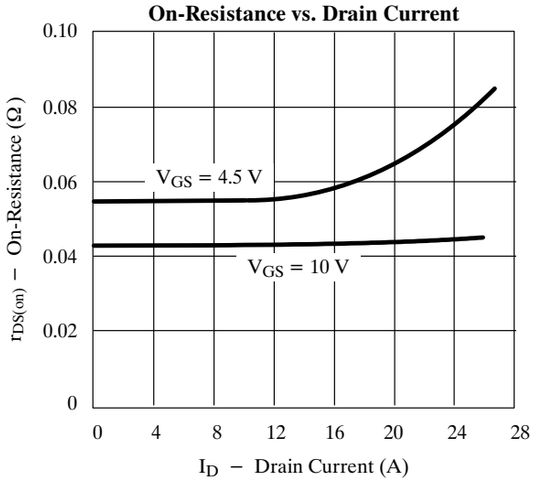
Output Characteristics



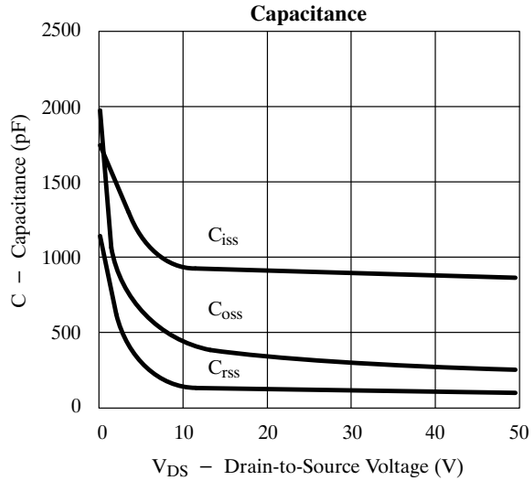
Transfer Characteristics



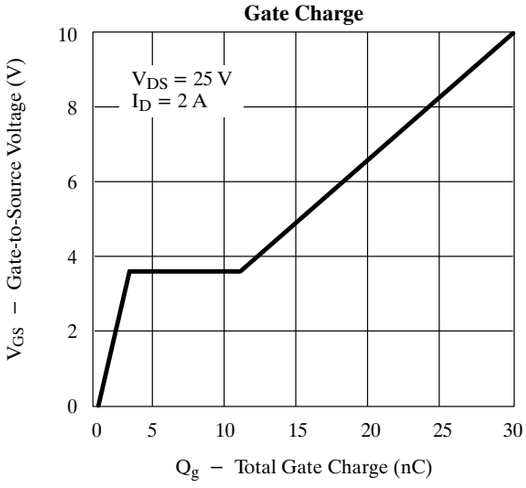
On-Resistance vs. Drain Current



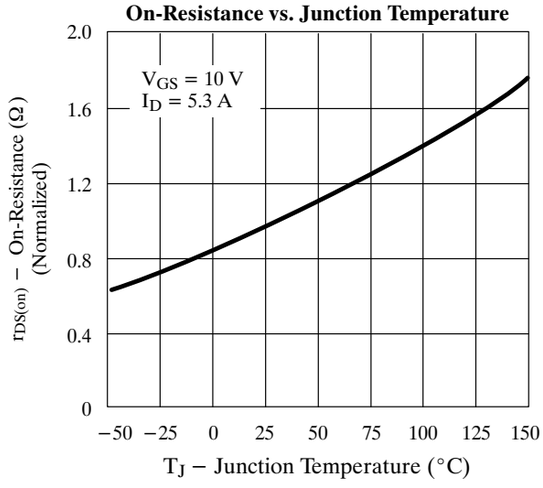
Capacitance



Gate Charge

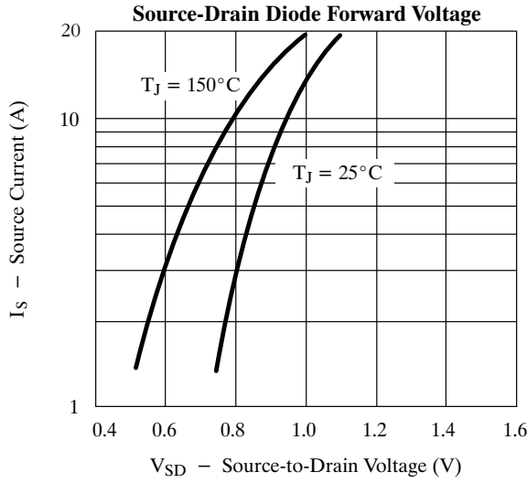


On-Resistance vs. Junction Temperature

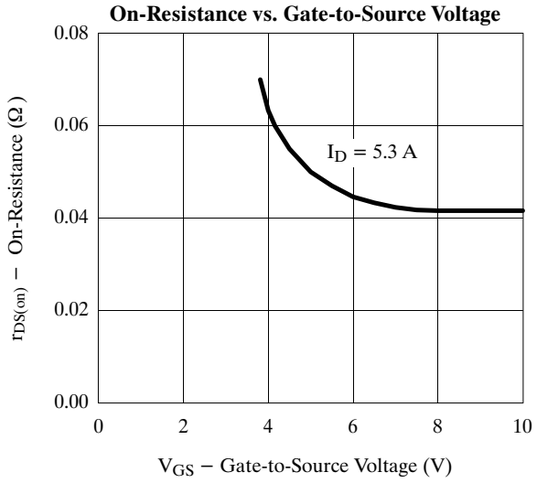


Typical Characteristics (25°C Unless Otherwise Noted)

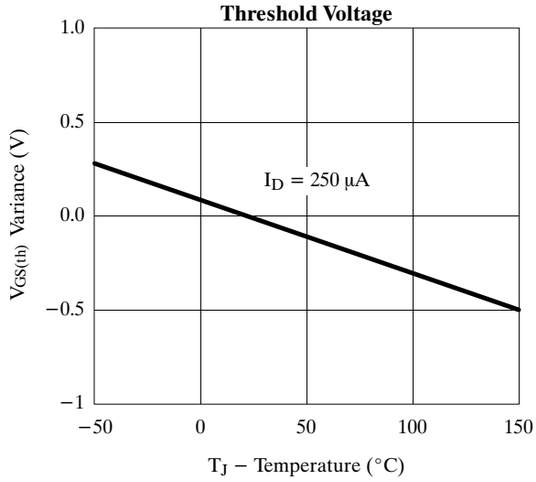
Source-Drain Diode Forward Voltage



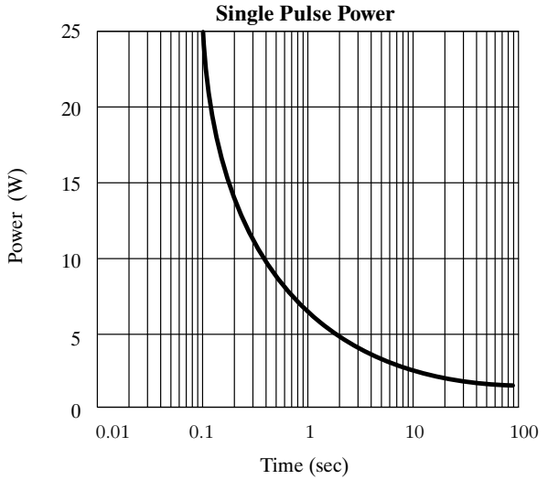
On-Resistance vs. Gate-to-Source Voltage



Threshold Voltage



Single Pulse Power



Normalized Thermal Transient Impedance, Junction-to-Ambient