Dual N-Channel 2.5-V (G-S) MOSFET
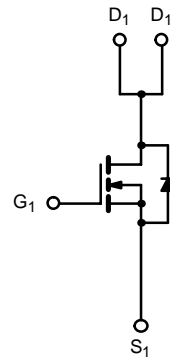
2.5-V Rated

PRODUCT SUMMARY

V_{DS} (V)	$r_{DS(on)}$ (Ω)	I_D (A)
20	0.05 @ V_{GS} = 4.5 V	5.0
	0.06 @ V_{GS} = 3.0 V	4.2
	0.08 @ V_{GS} = 2.5 V	3.6

SO-8

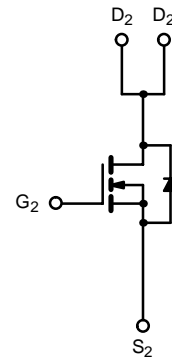|			
S_1	1	8	D_1
G_1	2	7	D_1
S_2	3	6	D_2
G_2	4	5	D_2

Top View
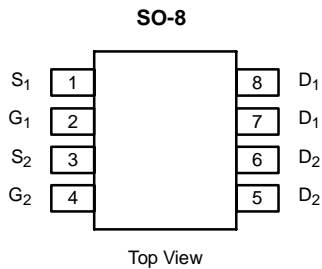
Ordering Information: Si9925DY
Si9925DY-T1 (with Tape and Reel)

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}	20	V
Gate-Source Voltage		V_{GS}	± 12	
Continuous Drain Current (T_J = 150°C)[a]	T_A = 25°C	I_D	5.0	A
	T_A = 70°C		4.0	
Pulsed Drain Current		I_{DM}	48	
Continuous Source Current (Diode Conduction)[a]		I_S	1.7	
Maximum Power Dissipation[a]	T_A = 25°C	P_D	2	W
	T_A = 70°C		1.3	
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}	62.5	°C/W

Notes
a.   Surface Mounted on FR4 Board, t $\leq$ 10 sec.
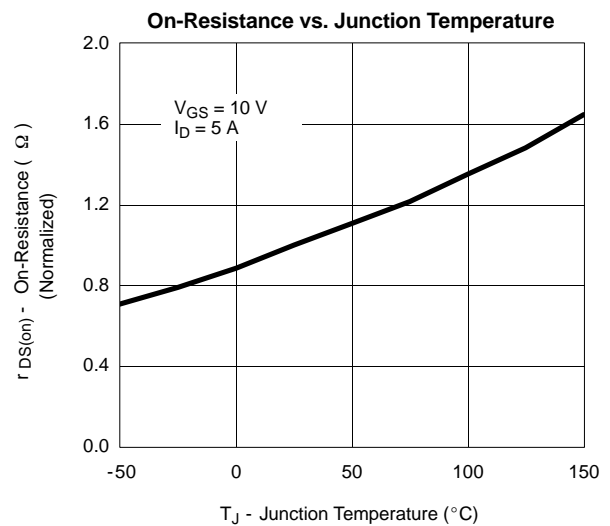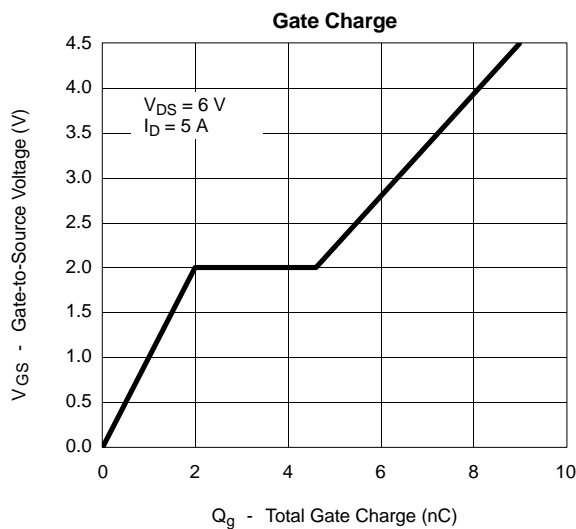
For SPICE model information via the Worldwide Web: http://www.vishay.com/www/product/spice.htm
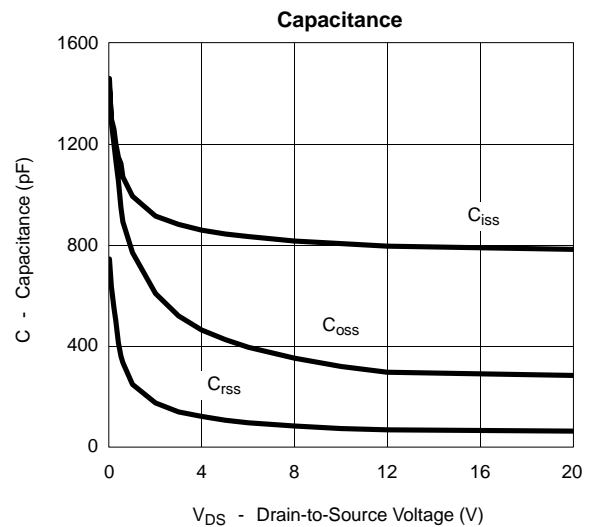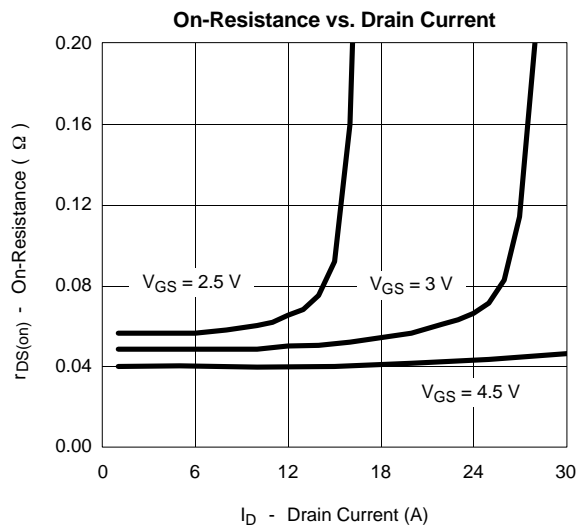
VISHAY

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	0.8			V
Gate-Body Leakage	I_{GSS}	V_{DS} = 0 V, $V_{GS} = \pm 12$ V			±100	nA
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS} = 10 V, V_{GS} = 0 V			1	μA
		V_{DS} = 16 V, V_{GS} = 0 V, T_J = 70°C			5	
On-State Drain Current[b]	$I_{D(on)}$	$V_{DS} \geq 5$ V, V_{GS} = 5 V	30			A
Drain-Source On-State Resistance[b]	$r_{DS(on)}$	V_{GS} = 7.2 V, I_D = 5.0 A	0.025	0.038	0.045	Ω
		V_{GS} = 4.5 V, I_D = 5.0 A		0.041	0.05	
		V_{GS} = 3.0 V, I_D = 3.9 A		0.050	0.06	
		V_{GS} = 2.5 V, I_D = 1 A		0.062	0.08	
Forward Transconductance[b]	g_{fs}	V_{DS} = 10 V, I_D = 5.0 A		14		S
Diode Forward Voltage[b]	V_{SD}	I_S = 5.0 A, V_{GS} = 0 V		0.81	1.2	V
Dynamic[a]						
Total Gate Charge	Q_g	V_{DS} = 6 V, V_{GS} = 4.5 V, I_D = 5.0 A		9	20	nC
Gate-Source Charge	Q_{gs}			2		
Gate-Drain Charge	Q_{gd}			2.6		
Gate Resistance	R_g		1		2.9	Ω
Turn-On Delay Time	$t_{d(on)}$	V_{DD} = 6 V, R_L = 6 Ω $I_D \cong 1$ A, V_{GEN} = 4.5 V, R_G = 6 Ω		14	40	ns
Rise Time	t_r			13	30	
Turn-Off Delay Time	$t_{d(off)}$			35	60	
Fall Time	t_f			9	30	
Source-Drain Reverse Recovery Time	t_{rr}	I_F = 5.0 A, di/dt = 100 A/μs		60	150	

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

TYPICAL CHARACTERISTICS (25°C UNLESS NOTED)

Output Characteristics

$V_{GS} = 5.5, 5, 4.5, 4, 3.5$ V

3 V

2.5 V

2 V

1.5 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)

On-Resistance vs. Drain Current

$V_{GS} = 2.5$ V

$V_{GS} = 3$ V

$V_{GS} = 4.5$ V

$r_{DS(on)}$ - On-Resistance (Ω)

I_D - Drain Current (A)

Capacitance

C_{iss}

C_{oss}

C_{rss}

C - Capacitance (pF)

V_{DS} - Drain-to-Source Voltage (V)

Gate Charge

$V_{DS} = 6$ V
$I_D = 5$ A

V_{GS} - Gate-to-Source Voltage (V)

Q_g - Total Gate Charge (nC)

On-Resistance vs. Junction Temperature

$V_{GS} = 10$ V
$I_D = 5$ A

$r_{DS(on)}$ - On-Resistance (Ω) (Normalized)

T_J - Junction Temperature (°C)

TYPICAL CHARACTERISTICS (25°C UNLESS NOTED)

Source-Drain Diode Forward Voltage

$T_J = 150°C$

$T_J = 25°C$

I_S - Source Current (A)

V_{SD} - Source-to-Drain Voltage (V)

On-Resistance vs. Gate-to-Source Voltage

$I_D = 5$ A

$r_{DS(on)}$ - On-Resistance (Ω)

V_{GS} - Gate-to-Source Voltage (V)

Threshold Voltage

$I_D = 250$ μA

$V_{GS(th)}$ Variance (V)

T_J - Temperature (°C)

Single Pulse Power

Power (W)

Time (sec)

Normalized Thermal Transient Impedance, Junction-to-Ambient

Duty Cycle = 0.5

0.2

0.1

0.05

0.02

Single Pulse

Normalized Effective Transient Thermal Impedance

Notes:

P_{DM}

t_1

t_2

1. Duty Cycle, D = $\dfrac{t_1}{t_2}$
2. Per Unit Base = R_{thJA} = 62.5°C/W
3. T_{JM} - T_A = $P_{DM}Z_{thJA}^{(t)}$
4. Surface Mounted

Square Wave Pulse Duration (sec)