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

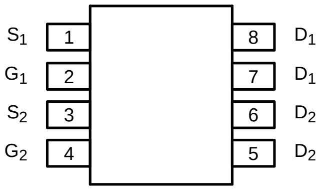
PRODUCT SUMMARY

V_{DS} (V)	$r_{DS(on)}$ (Ω)	I_D (A)
20	0.020 @ V_{GS} = 4.5 V	8.2
	0.030 @ V_{GS} = 2.5 V	6.7

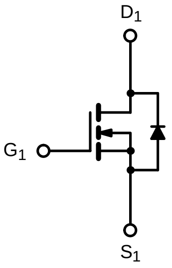
FEATURES

- TrenchFET® Power MOSFETS

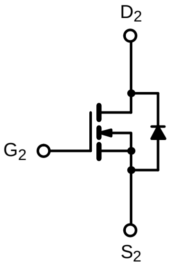
SO-8



Top View



N-Channel MOSFET



N-Channel MOSFET

Ordering Information: Si9926BDY
Si9926BDY-T1 (with Tape and Reel)

ABSOLUTE MAXIMUM RATINGS (T_A = 25°C UNLESS OTHERWISE NOTED)

Parameter		Symbol	10 secs	Steady State	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	8.2	6.2	A
	T_A = 70°C		6.5	4.9	
Pulsed Drain Current		I_{DM}	30		
Continuous Source Current (Diode Conduction)[a]		I_S	1.7	0.95	
Maximum Power Dissipation[a]	T_A = 25°C	P_D	2.0	1.14	W
	T_A = 70°C		1.3	0.72	
Operating Junction and Storage Temperature Range		T_J, T_{stg}	-55 to 150		°C

THERMAL RESISTANCE RATINGS

Parameter		Symbol	Typical	Maximum	Unit
Maximum Junction-to-Ambient[a]	t ≤ 10 sec	R_{thJA}	52	62.5	°C/W
	Steady State		90	110	
Maximum Junction-to-Foot (Drain)	Steady State	R_{thJF}	32	40	

Notes
a. Surface Mounted on 1" x 1" FR4 Board.

SPECIFICATIONS (T_J = 25°C UNLESS OTHERWISE NOTED)

Parameter	Symbol	Test Condition	Min	Typ	Max	Unit
Static						
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}$, $I_D = 250\ \mu A$	0.6		1.5	V
Gate-Body Leakage	I_{GSS}	$V_{DS} = 0$ V, $V_{GS} = \pm 12$ V			±100	nA
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS} = 16$ V, $V_{GS} = 0$ V			1	µA
		$V_{DS} = 16$ V, $V_{GS} = 0$ V, $T_J = 55°C$			5	
On-State Drain Current[a]	$I_{D(on)}$	$V_{DS} \geq 5$ V, $V_{GS} = 4.5$ V	30			A
Drain-Source On-State Resistance[a]	$r_{DS(on)}$	$V_{GS} = 4.5$ V, $I_D = 8.2$ A		0.016	0.020	Ω
		$V_{GS} = 2.5$ V, $I_D = 3.3$ A		0.024	0.030	
Forward Transconductance[a]	g_{fs}	$V_{DS} = 15$ V, $I_D = 8.2$ A		29		S
Diode Forward Voltage[a]	V_{SD}	$I_S = 1.7$ A, $V_{GS} = 0$ V		0.8	1.2	V
Dynamic[b]						
Total Gate Charge	Q_g	$V_{DS} = 10$ V, $V_{GS} = 4.5$ V, $I_D = 8.2$ A		11	20	nC
Gate-Source Charge	Q_{gs}			2.5		
Gate-Drain Charge	Q_{gd}			3.2		
Turn-On Delay Time	$t_{d(on)}$	$V_{DD} = 10$ V, $R_L = 10\ \Omega$ $I_D \cong 1$ A, $V_{GEN} = 4.5$ V, $R_G = 6\ \Omega$		35	55	ns
Rise Time	t_r			50	75	
Turn-Off Delay Time	$t_{d(off)}$			31	50	
Fall Time	t_f			15	25	
Source-Drain Reverse Recovery Time	t_{rr}	$I_F = 1.7$ A, di/dt = 100 A/µs		30	60	

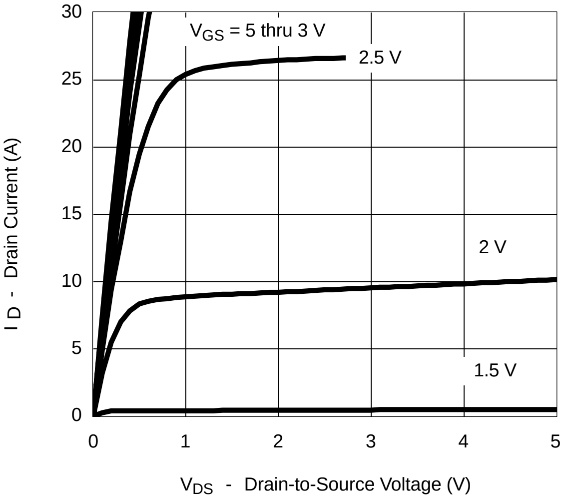
Notes

a. Pulse test; pulse width ≤ 300 µs, duty cycle ≤ 2%.

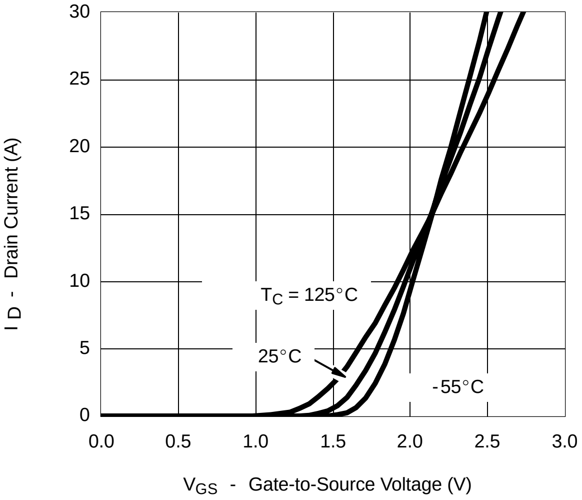
b. Guaranteed by design, not subject to production testing.

TYPICAL CHARACTERISTICS (25°C UNLESS NOTED)

Output Characteristics

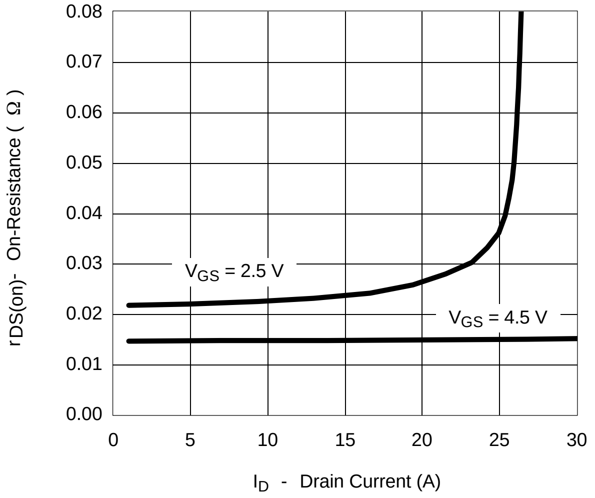


Transfer Characteristics

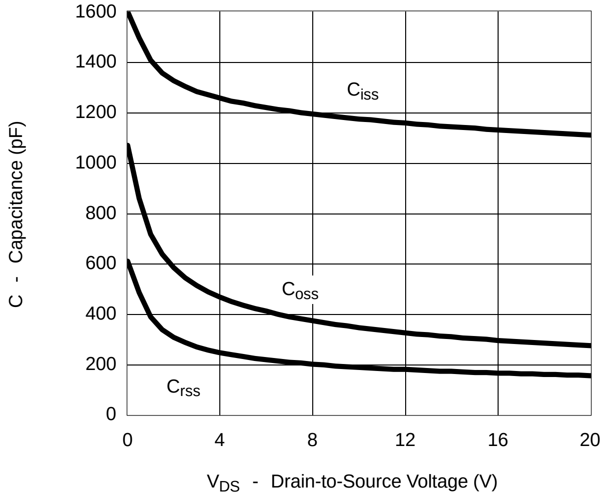


TYPICAL CHARACTERISTICS (25°C UNLESS NOTED)

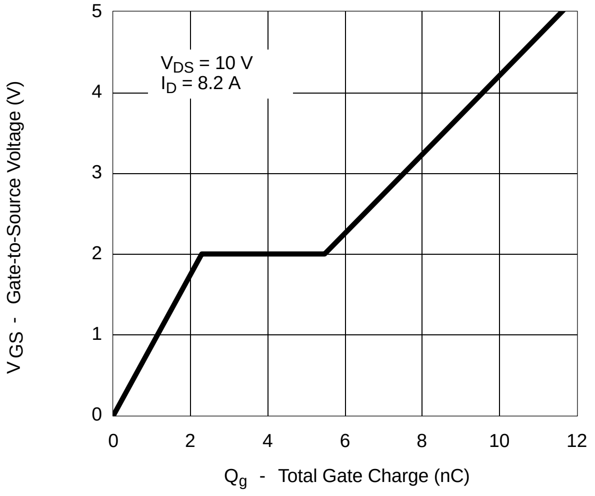
On-Resistance vs. Drain Current



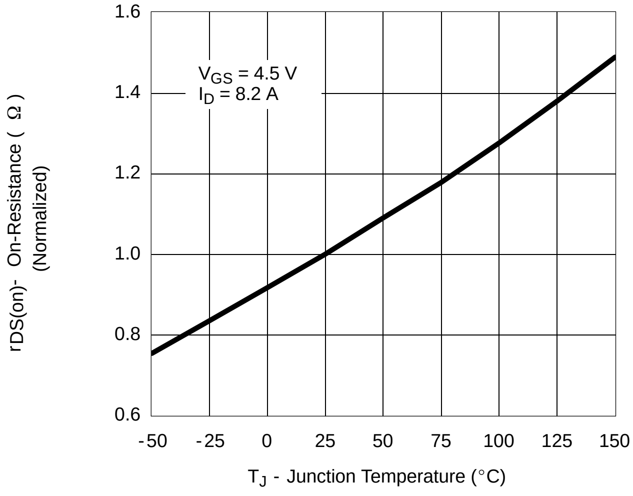
Capacitance



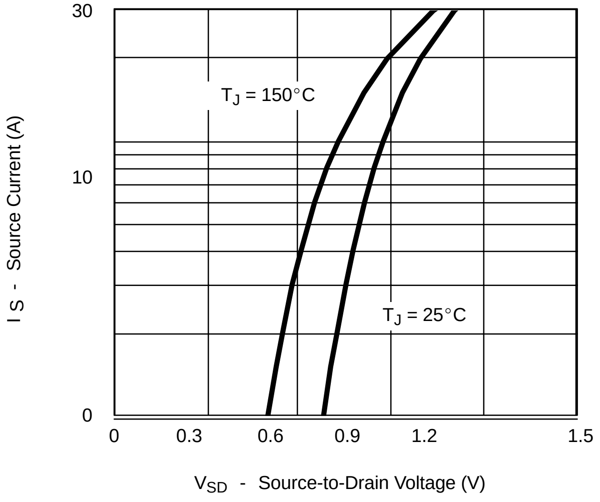
Gate Charge



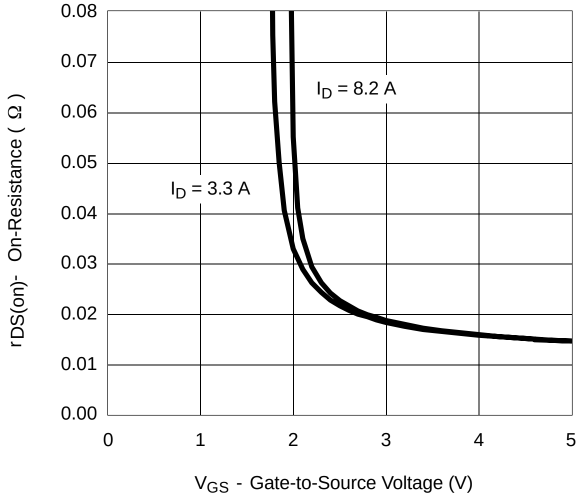
On-Resistance vs. Junction Temperature



Source-Drain Diode Forward Voltage

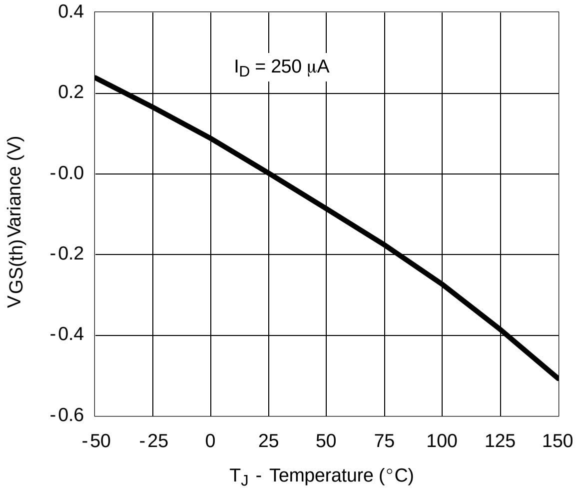


On-Resistance vs. Gate-to-Source Voltage

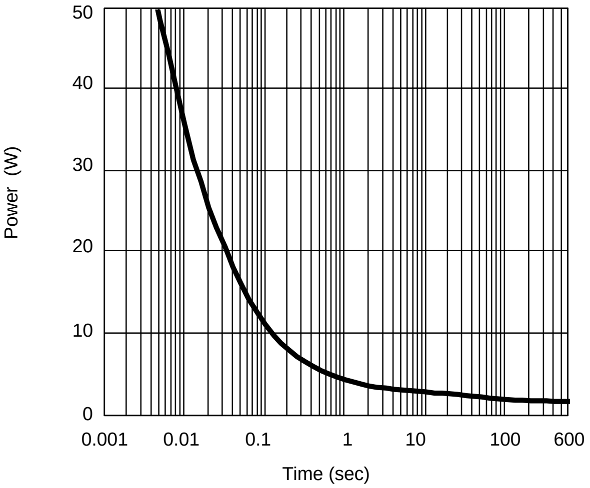


TYPICAL CHARACTERISTICS (25°C UNLESS NOTED)

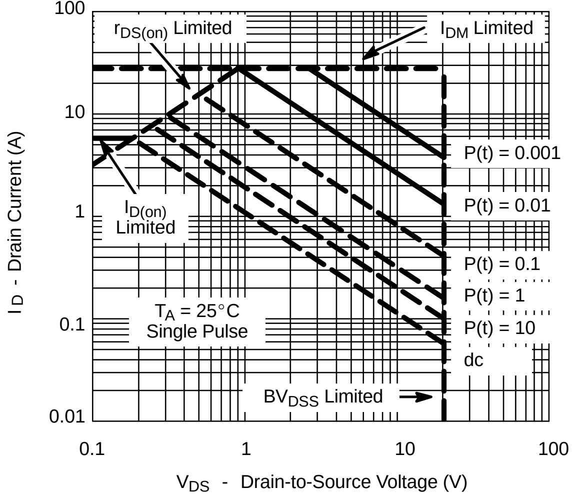
Threshold Voltage



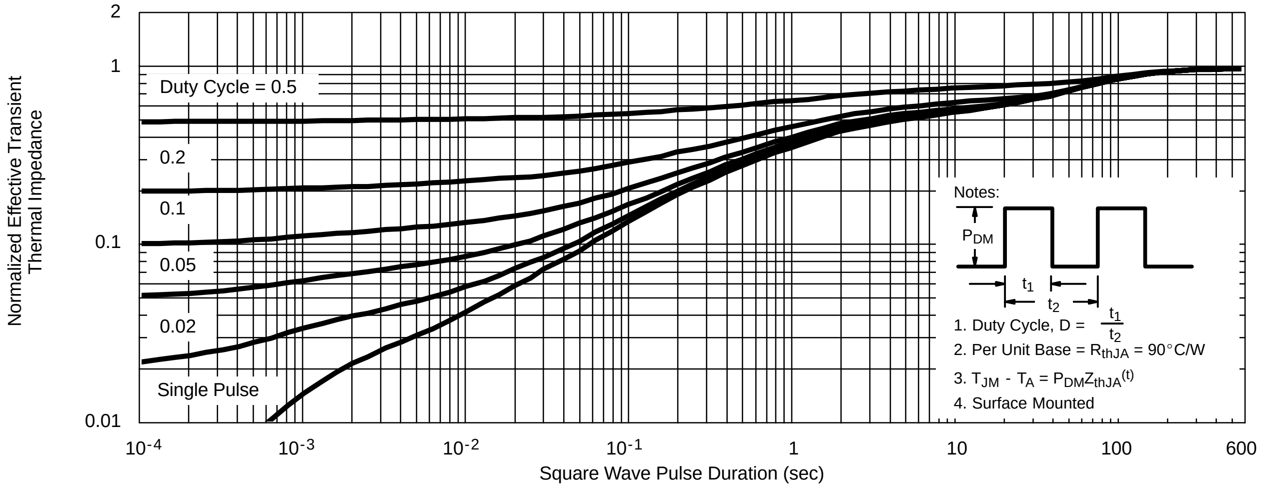
Single Pulse Power



Safe Operating Area



Normalized Thermal Transient Impedance, Junction-to-Ambient



Notes:

1. Duty Cycle, D = $\frac{t_1}{t_2}$
2. Per Unit Base = R_{thJA} = 90°C/W
3. T_{JM} - T_A = $P_{DM}Z_{thJA}^{(t)}$
4. Surface Mounted

TYPICAL CHARACTERISTICS (25°C UNLESS NOTED)

Normalized Thermal Transient Impedance, Junction-to-Case