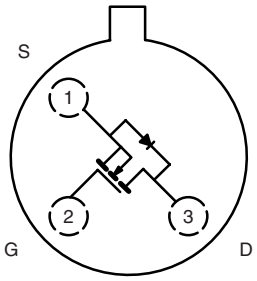
N-Channel 90-V (D-S) MOSFET

PRODUCT SUMMARY				
Part Number	**V_{DS} min. (V)**	**$R_{DS(on)}$ max. (Ω)**	**$V_{GS(th)}$ (V)**	**I_D (A)**
2N6661-2	90	4 at V_{GS} = 10 V	0.8 to 2	0.86

TO-205AD
(TO-39)



Top View

2N6661-2

Device Marking
Side View

2N6661-2
"S" *fxxyy*

"S" = Siliconix Logo
f = Factory Code
xxyy = Date Code

FEATURES

- Low On-Resistance: 3.6 Ω
- Low Threshold: 1.6 V
- Low Input Capacitance: 35 pF
- Fast Switching Speed: 6 ns
- Low Input and Output Leakage

BENEFITS

- Low Offset Voltage
- Low-Voltage Operation
- Easily Driven Without Buffer
- High-Speed Circuits
- Low Error Voltage

APPLICATIONS

- Direct Logic-Level Interface: TTL/CMOS
- Drivers: Relays, Solenoids, Lamps, Hammers, Displays, Memories, Transistors, etc.
- Battery Operated Systems
- Solid-State Relays

ABSOLUTE MAXIMUM RATINGS T_A = 25 °C, unless otherwise noted				
Parameter		**Symbol**	**2N6661-2**	**Unit**
Drain-Source Voltage		V_{DS}	90	V
Gate-Source Voltage		V_{GS}	± 20	
Continuous Drain Current (T_J = 150 °C)	T_C = 25 °C	I_D	0.86	A
	T_C = 100 °C		0.54	
Pulsed Drain Current[a]		I_{DM}	± 3	
Power Dissipation	T_C = 25 °C	P_D	6.25	W
	T_A = 25 °C		0.725	
Thermal Resistance, Junction-to-Ambient[b]		R_{thJA}	170	°C/W
Operating Junction and Storage Temperature Range		T_J, T_{stg}	- 65 to 150	°C

Notes:
a. Pulse width limited by maximum junction temperature.
b. This parameter not registered with JEDEC.

SPECIFICATIONS T_J = 25 °C, unless otherwise noted						
Parameter	**Symbol**	**Test Conditions**	**Typ.[a]**	**Limits**		**Unit**
				Min.	**Max.**	
Static						
Drain-Source Breakdown Voltage	V_{DS}	V_{GS} = 0 V, I_D = 10 µA	125	90		V
Gate-Threshold Voltage	$V_{GS(th)}$	V_{DS} = V_{GS}, I_D = 1 mA	1.6	0.8	2	
		T_A = - 55 °C	1.8		2.5	
		T_A = 125 °C	1.3	0.3		
Gate-Body Leakage	I_{GSS}	V_{DS} = 0 V, V_{GS} = ± 20 V			± 100	nA
		T_A = 125 °C			± 500	
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS} = 72 V, V_{GS} = 0 V			1	µA
		V_{DS} = 72 V, V_{GS} = 0 V, T_A = 125 °C			100	
On-State Drain Current[b]	$I_{D(on)}$	V_{DS} = 10 V, V_{GS} = 10 V	1.8			A
Drain-Source On-Resistance[b]	$R_{DS(on)}$	V_{GS} = 5 V, I_D = 0.3 A	3.8		5.3	Ω
		V_{GS} = 10 V, I_D = 1 A	3.6		4	
		T_A = 125 °C[d]	6.7		7.5	
Forward Transconductance[b]	g_{fs}	V_{DS} = 7.5 V, I_D = 0.475 A	340	170		mS
Diode Forward Voltage	V_{SD}	I_S = 0.86 A, V_{GS} = 0 V	0.9	0.7	1.4	V
Dynamic						
Input Capacitance	C_{iss}	V_{DS} = 25 V, V_{GS} = 0 V, f = 1 MHz	35		50	pF
Output Capacitance	C_{oss}		15		40	
Reverse Transfer Capacitance	C_{rss}		2		10	
Drain-Source Capacitance	C_{ds}		30			
Switching[c]						
Turn-On Time	t_{ON}	V_{DD} = 25 V, R_L = 23 Ω, I_D ≅ 1 A, V_{GEN} = 10 V, R_{GS} = 23 Ω	6		10	ns
Turn-Off Time	t_{OFF}		8		10	

Notes:

a. For DESIGN AID ONLY, not subject to production testing.

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

c. Switching time is essentially independent of operating temperature.

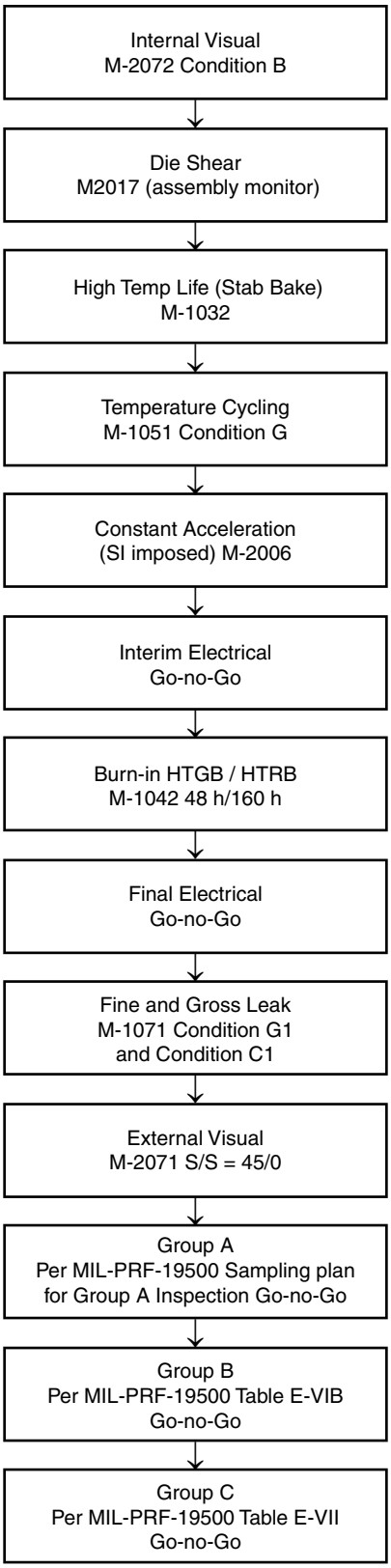
d. This parameter not registered with JEDEC.

Stresses beyond those listed under "Absolute Maximum Ratings" may cause permanent damage to the device. These are stress ratings only, and functional operation of the device at these or any other conditions beyond those indicated in the operational sections of the specifications is not implied. Exposure to absolute maximum rating conditions for extended periods may affect device reliability.

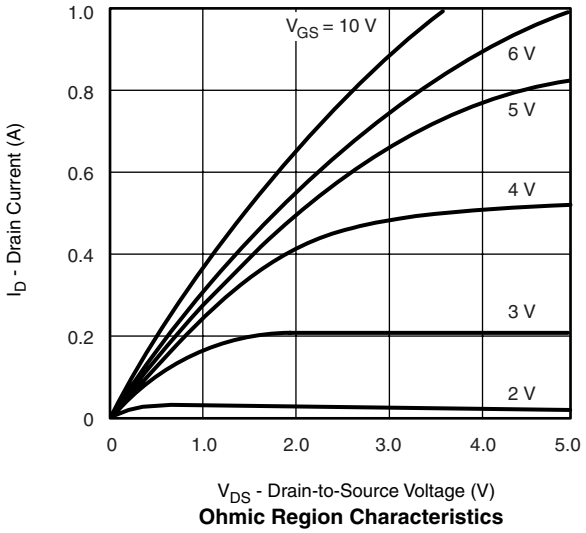
PROCESS FLOW	
Description	**MIL-STD 750 Methods**
Internal Visual	M-2072 Condition B
Die Shear	M-2017[a]
Stabilization Bake	M-1032
Temperature Cycling	M-1051 Condition G
Constant Acceleration	M-2006
Interim Electrical	Go-no-Go
Burn-In (HTGB)	M1042_Condition B (48 h)
Burn-In (HTRB)	M1042_Condition A (160 h)
Final Electrical	Go-no-Go
Fine Leak	M-1071 Condition G1
Gross Leak	M-1071 Condition C1
External Visual	M-2071 S/S = 45/0
Group A Per MIL-PRF-19500 Sampling plan for Group A Inspection	per spec.
Group B Per MIL-PRF-19500	per spec.
Group C Per MIL-PRF-19500	per spec.
Deltas Option	per spec.[b]
Solder Dip Option	per spec.[b]

Notes:
a. Test performed on line during assembly procedure (monitor).
b. Per spec is a reference to Vishay Siliconix data sheet or customer SCD whichever applies.

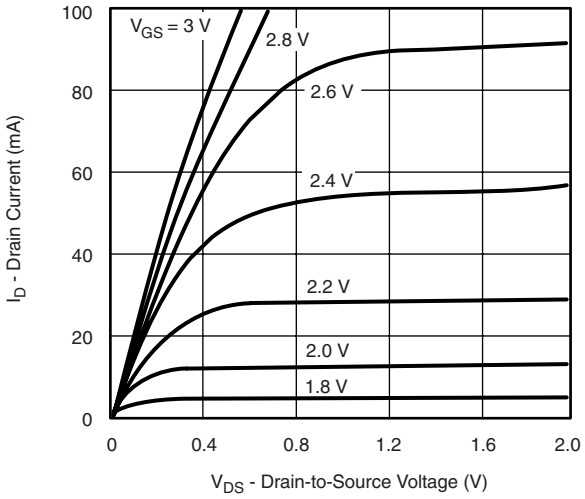
MANUFACTURING FLOW



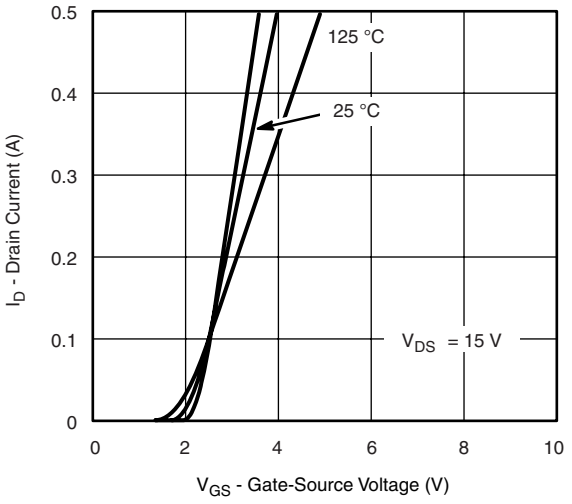
TYPICAL CHARACTERISTICS 25 °C, unless otherwise noted



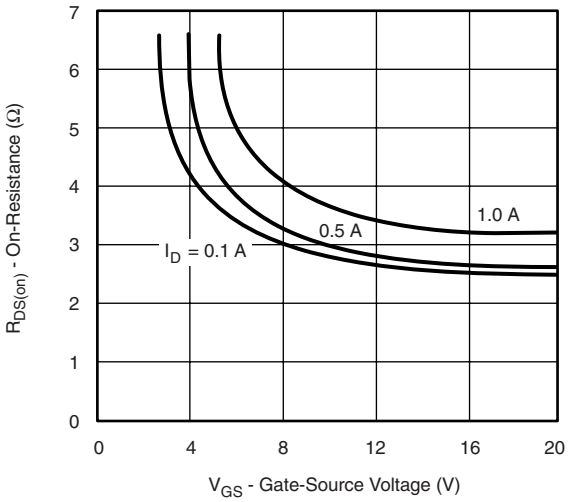
Ohmic Region Characteristics



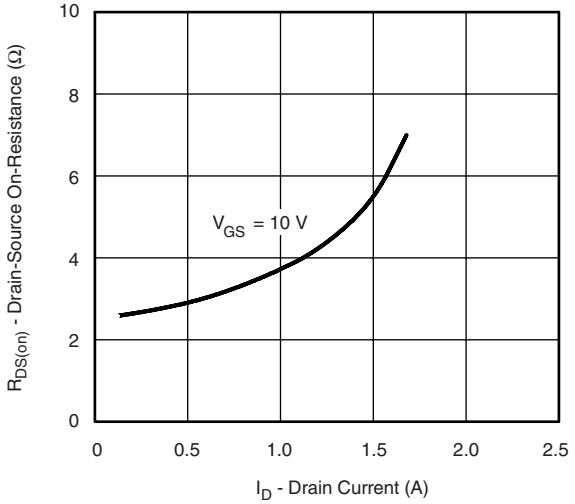
Output Characteristics for Low Gate Drive



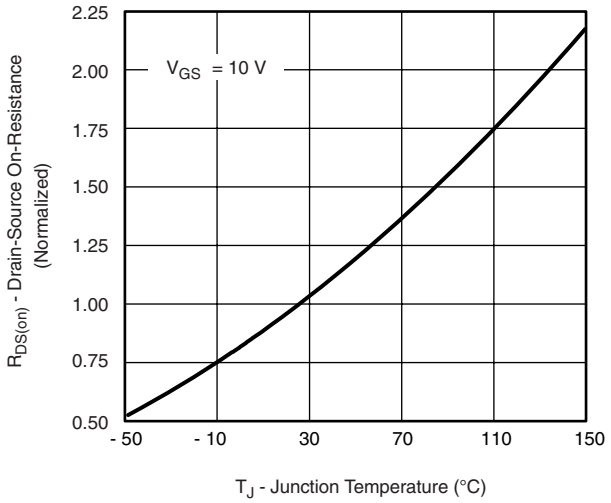
Transfer Characteristics



On-Resistance vs. Gate-to-Source Voltage

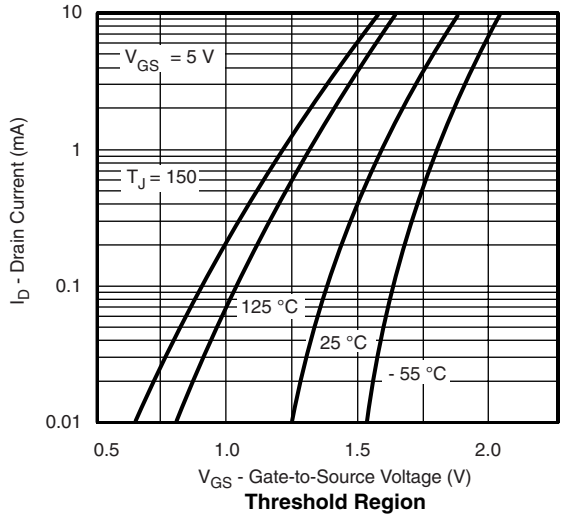


On-Resistance vs. Drain Current

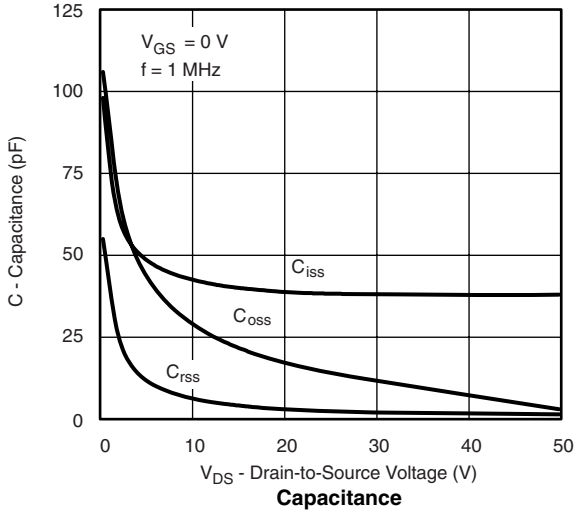


Normalized On-Resistance vs. Junction Temperature

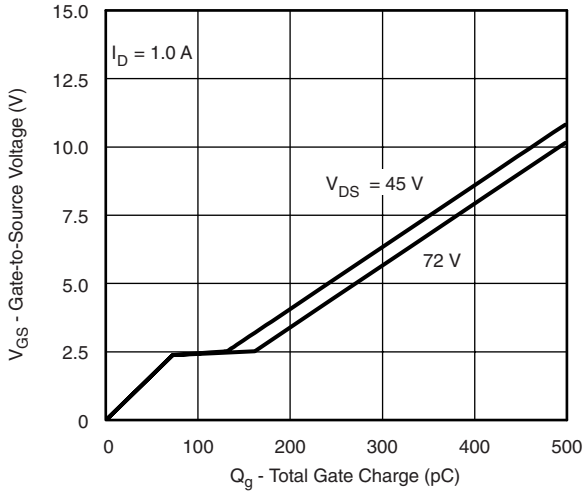
TYPICAL CHARACTERISTICS 25 °C, unless otherwise noted



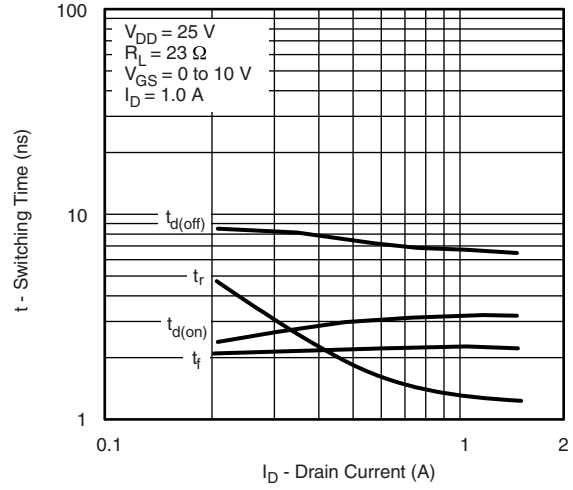
Threshold Region



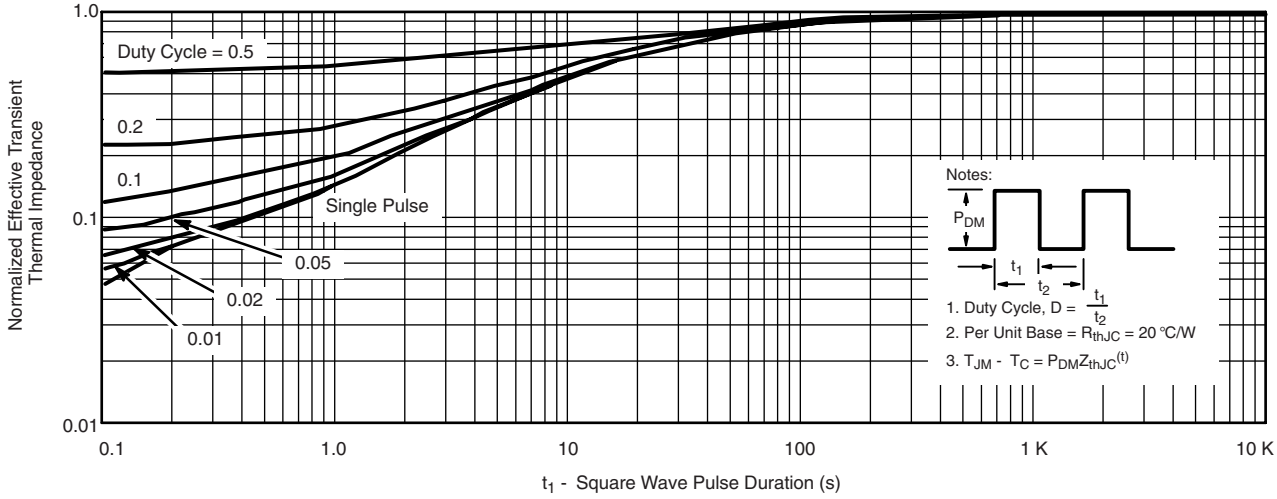
Capacitance



Gate Charge



Load Condition Effects on Switching



Normalized Effective Transient Thermal Impedance, Junction-to-Case (2N6661-2)

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