

N-Channel Enhancement-Mode MOSFET

Product Summary

$V_{(BR)DSS}$ Min (V)	$r_{DS(on)}$ Max (Ω)	$V_{GS(th)}$ (V)	I_D (A)
300	12 @ $V_{GS} = 10$ V	0.8 to 3	0.18
	20 @ $V_{GS} = 4.5$ V		

Features

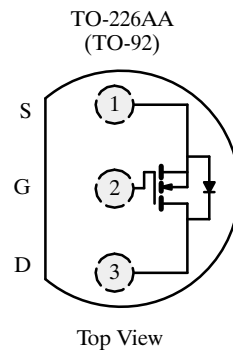
- Low On-Resistance: 9Ω
- Secondary Breakdown Free: 320 V
- Low Power/Voltage Driven
- Low Input and Output Leakage
- Excellent Thermal Stability

Benefits

- Low Offset Voltage
- Full-Voltage Operation
- Easily Driven Without Buffer
- Low Error Voltage
- No High-Temperature "Run-Away"

Applications

- High-Voltage Drivers: Relays, Solenoids, Lamps, Hammers, Displays, Transistors, etc.
- Telephone Mute Switches, Ringer Circuits
- Power Supply, Converters
- Motor Control



Absolute Maximum Ratings ($T_A = 25^\circ\text{C}$ Unless Otherwise Noted)

Parameter	Symbol	Limit	Unit
Drain-Source Voltage	V_{DS}	300	V
Gate-Source Voltage	V_{GS}	± 20	
Continuous Drain Current ($T_J = 150^\circ\text{C}$)	I_D	$T_A = 25^\circ\text{C}$	0.18
		$T_A = 100^\circ\text{C}$	0.14
Pulsed Drain Current	I_{DM}	0.5	A
Power Dissipation	P_D	$T_A = 25^\circ\text{C}$	0.8
		$T_A = 100^\circ\text{C}$	0.32
Maximum Junction-to-Ambient	R_{thJA}	156	$^\circ\text{C}/\text{W}$
Operating Junction and Storage Temperature Range	T_J, T_{stg}	-55 to 150	$^\circ\text{C}$

Notes

- a. Pulse width limited by maximum junction temperature.

Specifications^a

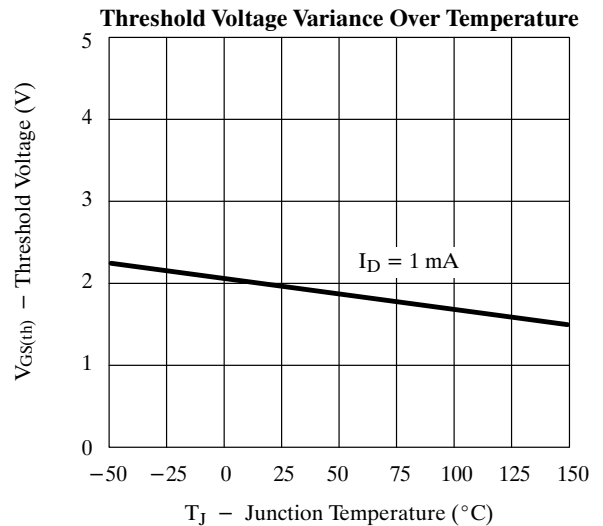
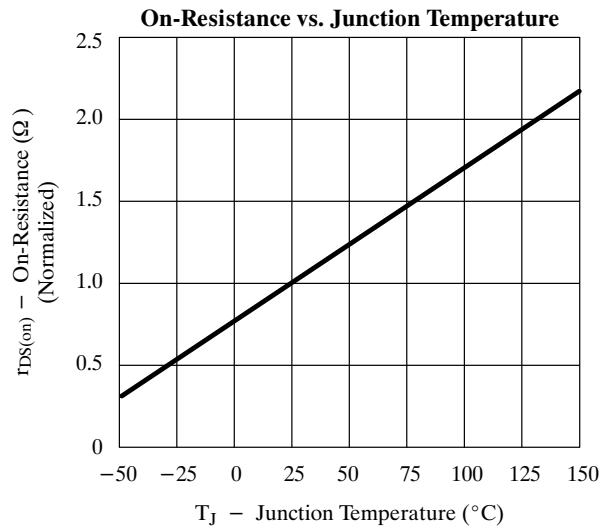
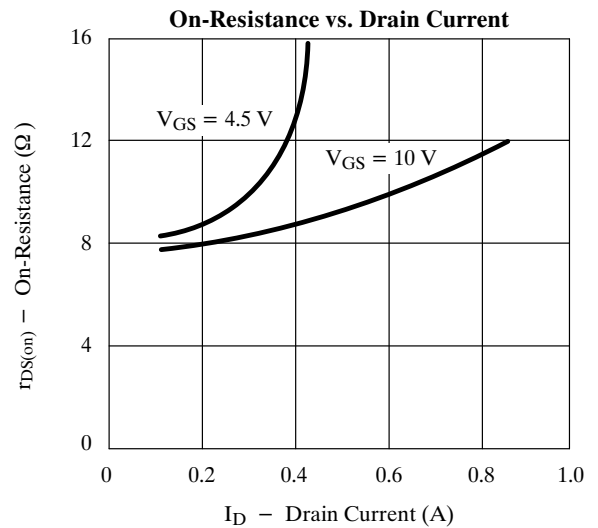
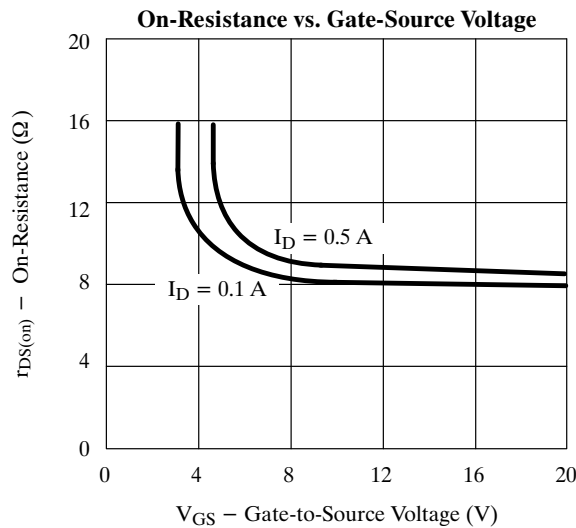
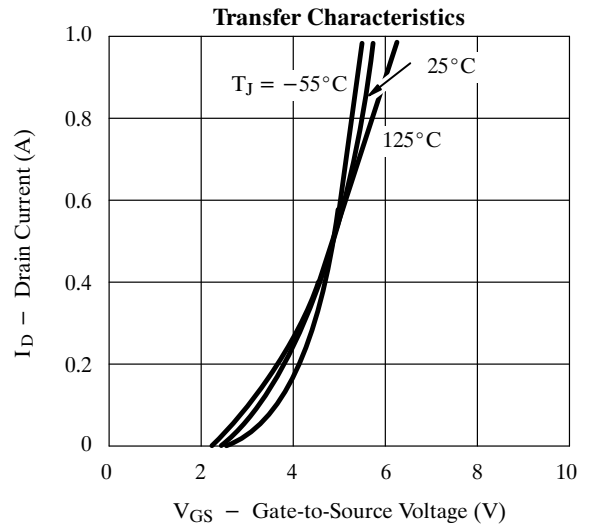
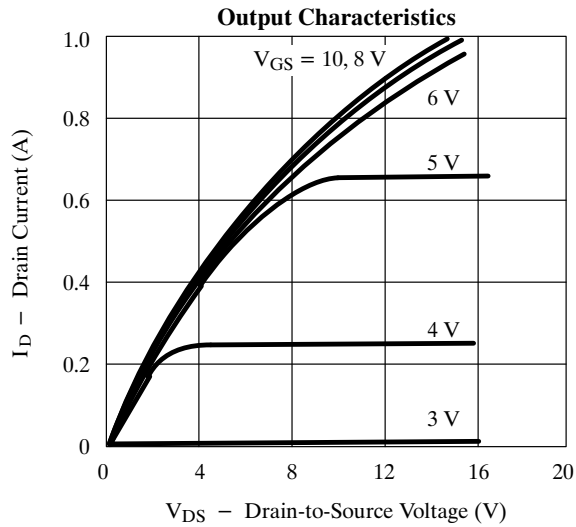
Parameter	Symbol	Test Conditions	Limits			Unit
			Min	Typ ^b	Max	
Static						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	$V_{GS} = 0\text{ V}, I_D = 10\ \mu\text{A}$	300	320		V
Gate-Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = 0.25\ \text{mA}$	0.8	2.1	3.0	
Gate-Body Leakage	I_{GSS}	$V_{DS} = 0\ \text{V}, V_{GS} = \pm 20\ \text{V}$			± 10	nA
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS} = 120\ \text{V}, V_{GS} = 0\ \text{V}$ $T_J = 125^\circ\text{C}$			0.1	μA
					5	
On-State Drain Current ^c	$I_{D(on)}$	$V_{DS} = 5\ \text{V}, V_{GS} = 10\ \text{V}$	0.2	0.5		A
Drain-Source On-Resistance ^c	$r_{DS(on)}$	$V_{GS} = 10\ \text{V}, I_D = 0.18\ \text{A}$ $V_{GS} = 4.5\ \text{V}, I_D = 0.14\ \text{A}$ $T_J = 125^\circ\text{C}$		9	12	Ω
				11	20	
				20	40	
Forward Transconductance ^c	g_{fs}	$V_{DS} = 15\ \text{V}, I_D = 0.1\ \text{A}$		160		mS
Diode Forward Voltage	V_{SD}	$I_S = 0.18\ \text{A}, V_{GS} = 0\ \text{V}$		0.8		V
Dynamic						
Total Gate Charge	Q_g	$V_{DS} = 50\ \text{V}, V_{GS} = 10\ \text{V}, I_D \cong 100\ \text{mA}$		3300		pC
Gate-Source Charge	Q_{gs}			38		
Gate-Drain Charge	Q_{gd}			1600		
Input Capacitance	C_{iss}	$V_{DS} = 50\ \text{V}, V_{GS} = 0\ \text{V}, f = 1\ \text{MHz}$		40		pF
Output Capacitance	C_{oss}			8		
Reverse Transfer Capacitance	C_{rss}			3		
Switching^d						
Turn-On Time	$t_{d(on)}$	$V_{DD} = 50\ \text{V}, R_L = 500\ \Omega, I_D \cong 100\ \text{mA}$ $V_{GEN} = 10\ \text{V}, R_G = 25\ \Omega$		5	10	ns
	t_r			20	40	
Turn-Off Time	$t_{d(off)}$			25	50	
	t_f			30	60	

Notes

- $T_A = 25^\circ\text{C}$ unless otherwise noted.
- For DESIGN AID ONLY, not subject to production testing.
- Pulse test: $PW \leq 300\ \mu\text{s}$ duty cycle $\leq 2\%$.
- Switching time is essentially independent of operating temperature.

VNAS30

Typical Characteristics (25°C Unless Otherwise Noted)



TN3012L

Typical Characteristics (25°C Unless Otherwise Noted)

