



N-Channel 20-V (D-S) MOSFET

PRODUCT SUMMARY

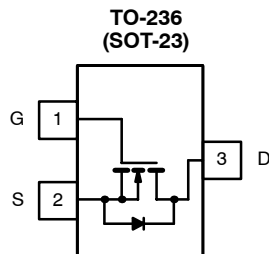
$V_{(BR)DSS}$ Min (V)	$r_{DS(on)}$ Max (Ω)	$V_{GS(th)}$ (V)	I_D (A)	
			TN0201K	TN0201KL
20	1.0 @ $V_{GS} = 10$ V	1.0 to 3.0	0.42	0.64
	1.4 @ $V_{GS} = 4.5$ V		0.35	0.53

FEATURES

- TrenchFET® Power MOSFET

APPLICATIONS

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



TN0201K

Marking Code: K3ywI

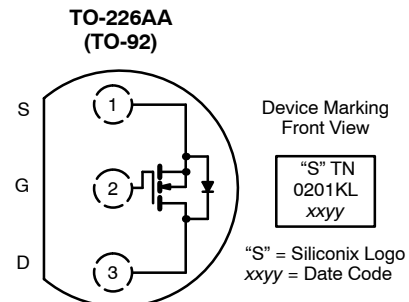
K3 = Part Number Code for TN0201K

y = Year Code

w = Week Code

I = Lot Traceability

Ordering Information: TN0201K-T1—E3 (Lead Free)



TN0201KL

Ordering Information: TN0201KL-TR1

ABSOLUTE MAXIMUM RATINGS ($T_A = 25^\circ\text{C}$ UNLESS OTHERWISE NOTED)

Parameter		Symbol	Limit		Unit
			TN0201K	TN0201KL	
Drain-Source Voltage		V _{DS}	20		V
Gate-Source Voltage		V _{GS}	± 20		
Continuous Drain Current (T _J = 150°C)	T _A = 25°C	I _D	0.42	0.64	A
	T _A = 70°C		0.33	0.51	
Pulsed Drain Current ^a		I _{DM}	0.8	1.5	
Power Dissipation	T _A = 25°C	P _D	0.35	0.8	W
	T _A = 70°C		0.22	0.51	
Thermal Resistance, Junction-to-Ambient		R _{thJA}	357	156	°C/W
Operating Junction and Storage Temperature Range		T _J , T _{stg}	-55 to 150		°C

Notes

a. Pulse width limited by maximum junction temperature.

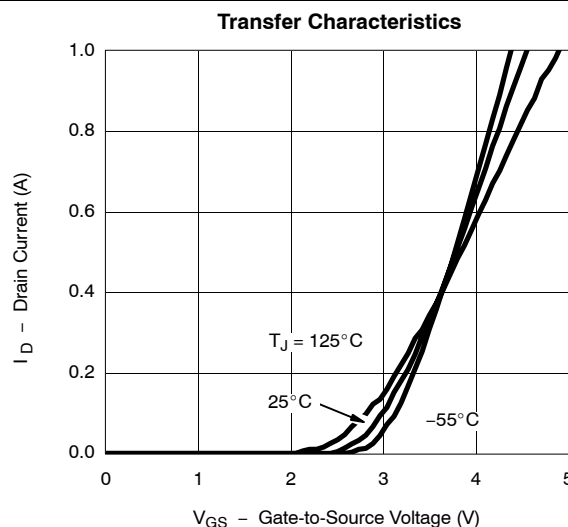
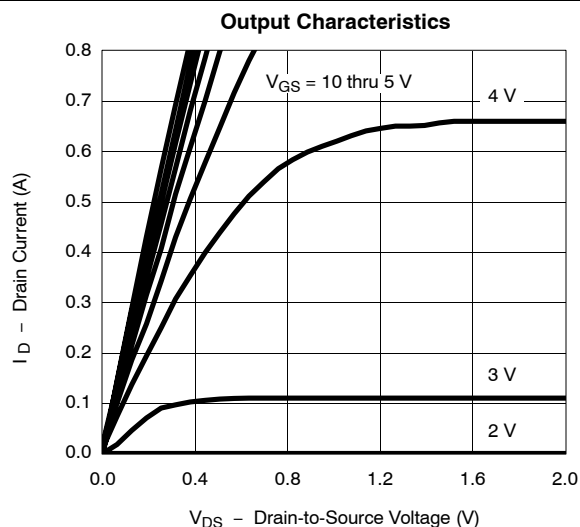
SPECIFICATIONS ($T_A = 25^\circ\text{C}$ UNLESS OTHERWISE NOTED)

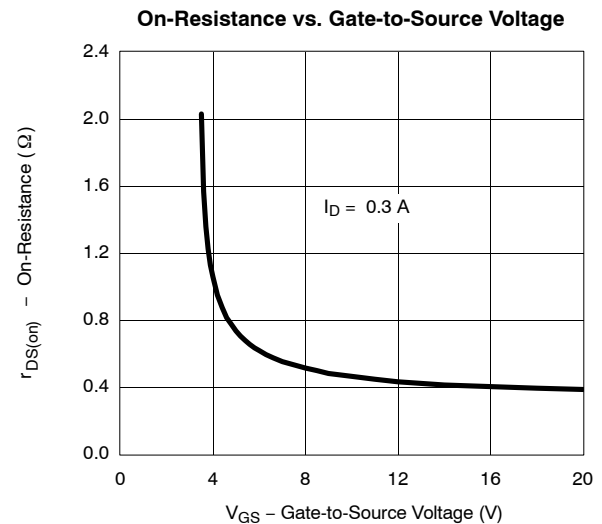
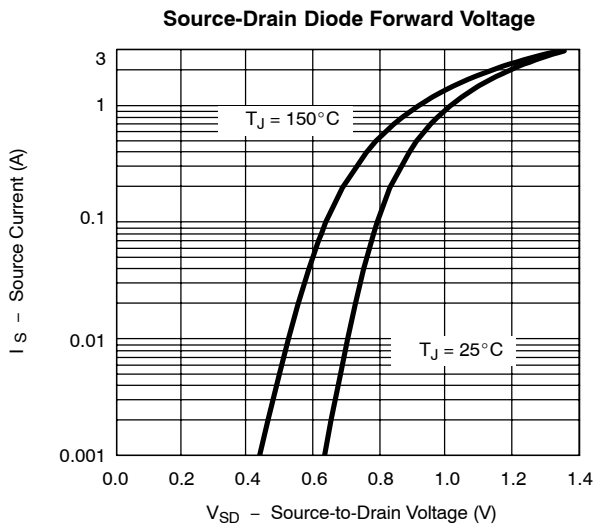
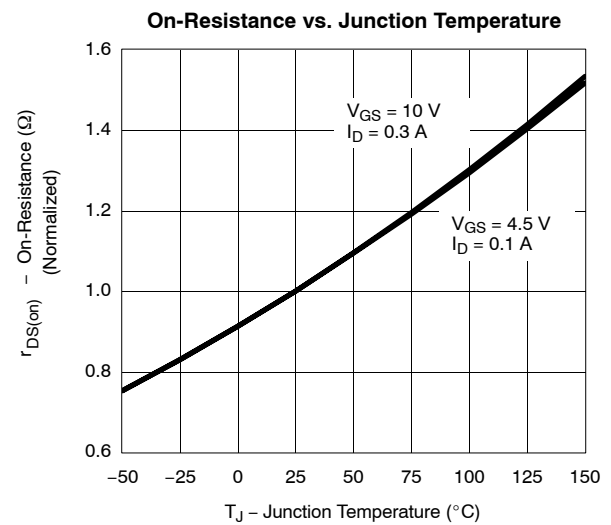
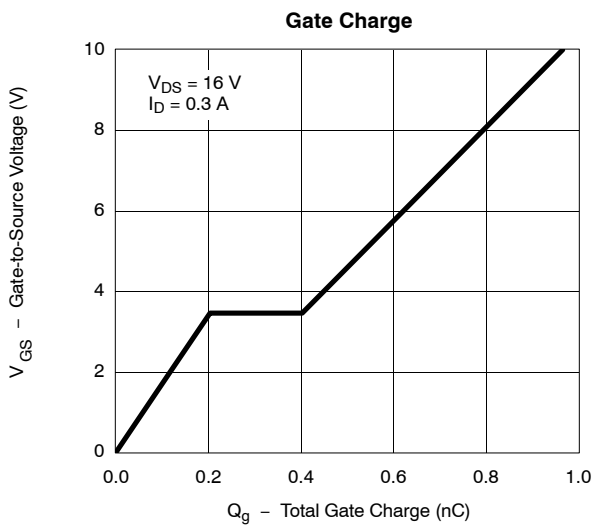
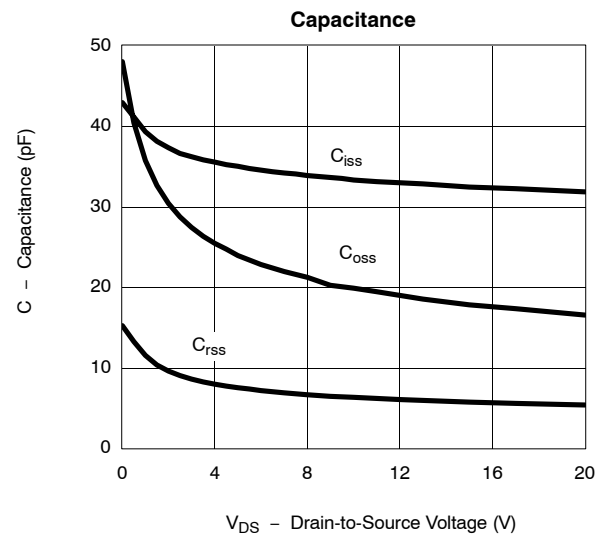
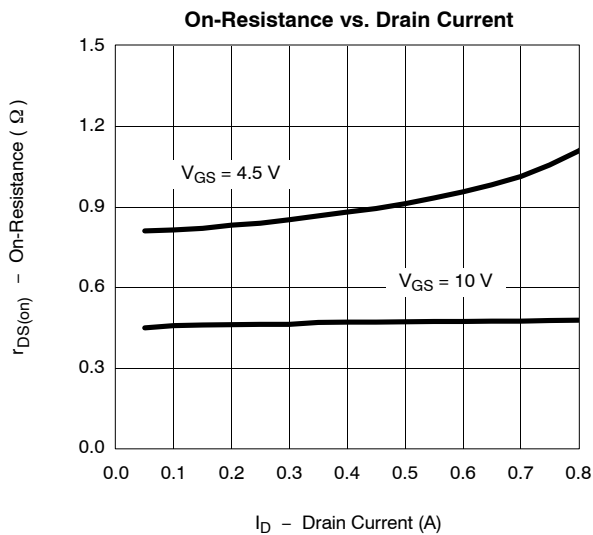
Parameter	Symbol	Test Conditions		Limits			Unit
				Min	Typ	Max	
Static							
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	$V_{GS} = 0\text{ V}, I_D = 10\text{ }\mu\text{A}$		20			V
Gate-Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = 0.25\text{ mA}$		1.0	2.0	3.0	
Gate-Body Leakage	I_{GSS}	$V_{DS} = 0\text{ V}, V_{GS} = \pm 20\text{ V}$				± 100	nA
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS} = 20\text{ V}, V_{GS} = 0\text{ V}$				1	μA
		$V_{DS} = 20\text{ V}, V_{GS} = 0\text{ V}, T_J = 55^\circ\text{C}$				10	
On-State Drain Current ^a	$I_{D(on)}$	$V_{DS} = 10\text{ V}, V_{GS} = 10\text{ V}$	TN0201K	0.5			A
			TN0201KL	0.8			
Drain-Source On-Resistance ^a	$r_{DS(on)}$	$V_{GS} = 4.5\text{ V}, I_D = 0.1\text{ A}$			0.8	1.4	Ω
		$V_{GS} = 10\text{ V}, I_D = 0.3\text{ A}$			0.47	1.0	
Forward Transconductance ^a	g_{fs}	$V_{DS} = 10\text{ V}, I_D = 0.3\text{ A}$			550		mS
Diode Forward Voltage	V_{SD}	$I_S = 0.3\text{ A}, V_{GS} = 0\text{ V}$			0.85	1.2	V
Dynamic ^b							
Total Gate Charge	Q_g	$V_{DS} = 16\text{ V}, V_{GS} = 10\text{ V}$ $I_D \equiv 0.3\text{ A}$			1000	1500	pC
Gate-Source Charge	Q_{gs}				205		
Gate-Drain Charge	Q_{gd}				200		
Gate Resistance	R_g				48		Ω
Turn-On Time	$t_{d(on)}$	$V_{DD} = 15\text{ V}, R_L = 50\text{ }\Omega$ $I_D \equiv 0.3\text{ A}, V_{GEN} = 10\text{ V}$ $R_G = 6\text{ }\Omega$			4.5	8	ns
	t_r				8	15	
Turn-Off Time	$t_{d(off)}$				9	15	
	t_f				6.3	12	

Notes

a. Pulse test: $PW \leq 300\text{ }\mu\text{s}$ duty cycle $\leq 2\%$.

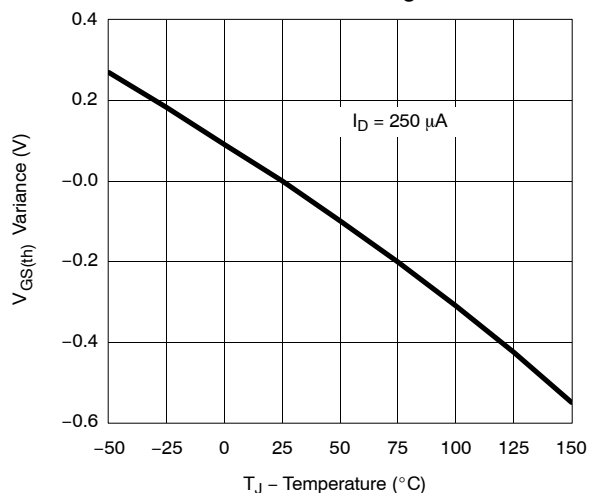
b. Guaranteed by design, not subject to production testing.

TYPICAL CHARACTERISTICS (25°C UNLESS NOTED)

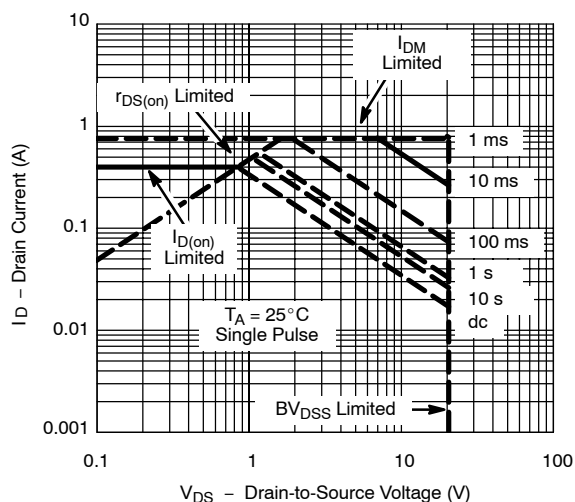
**TYPICAL CHARACTERISTICS (25°C UNLESS NOTED)**

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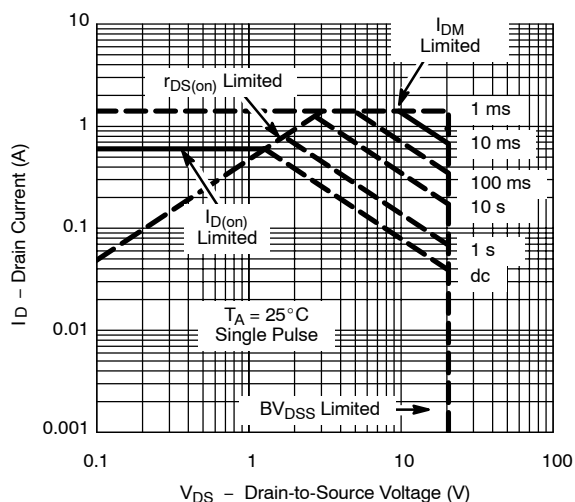
Threshold Voltage



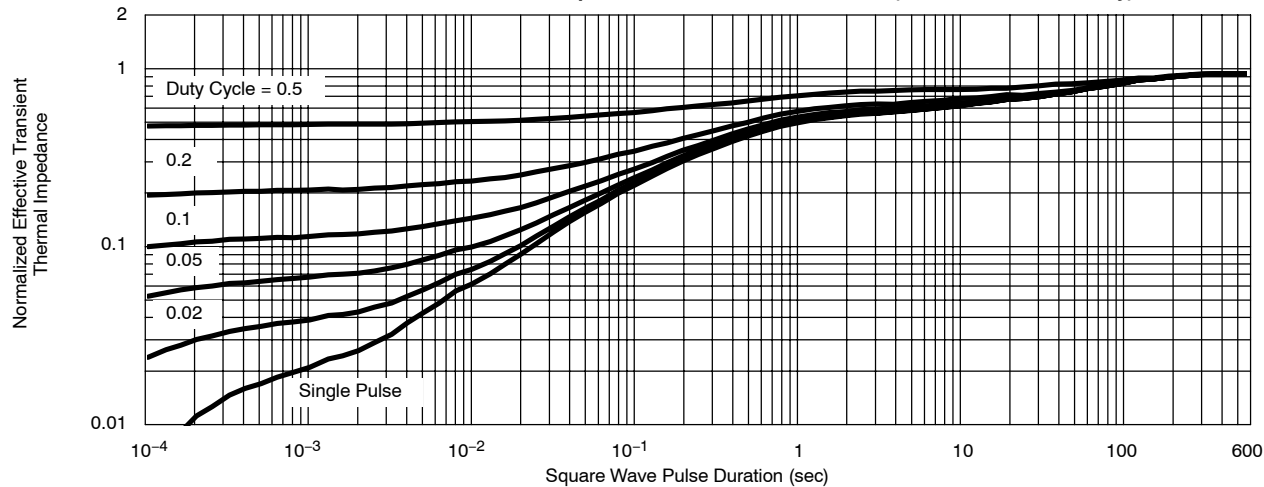
Safe Operating Area (TO-236, TN0201K Only)



Safe Operating Area (TO-226AA, TN0201KL Only)

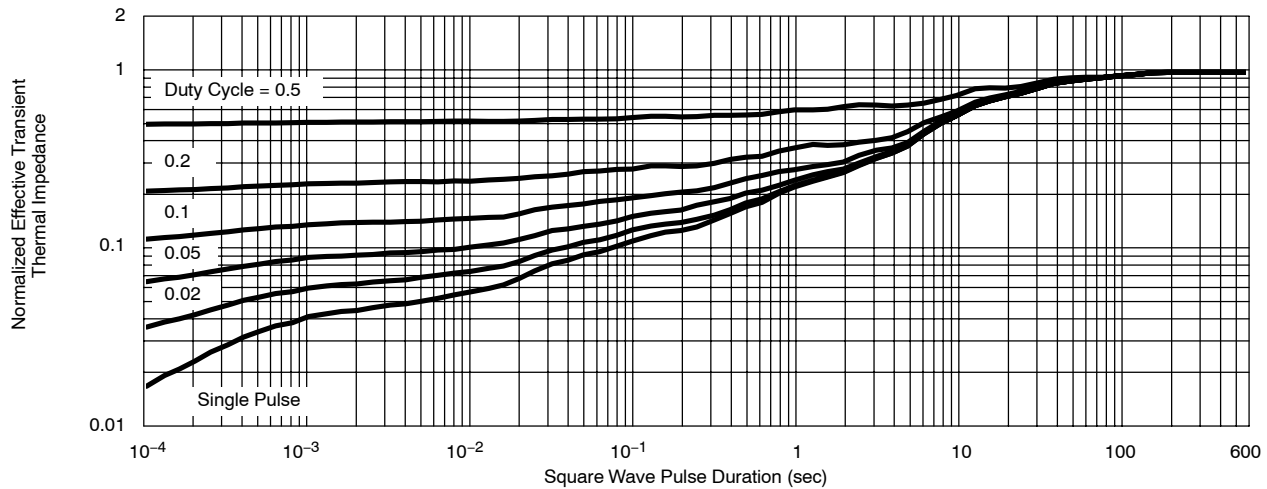


Normalized Thermal Transient Impedance, Junction-to-Ambient (TO-236, TN0201K Only)



**TYPICAL CHARACTERISTICS (25°C UNLESS NOTED)**

Normalized Thermal Transient Impedance, Junction-to-Ambient (TO-226AA, TN0201KL Only)





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