



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

PRODUCT SUMMARY

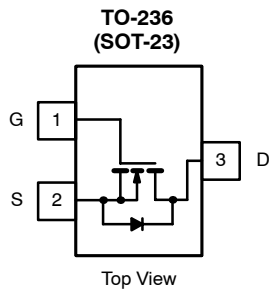
V_{DS} (V)	$r_{DS(on)}$ (Ω)	I_D (A)
20	0.4 @ $V_{GS} = 4.5$ V	0.73
	0.5 @ $V_{GS} = 2.5$ V	0.65

FEATURES

- TrenchFET® Power MOSFET
- ESD Protected: 4000 V

APPLICATIONS

- Direct Logic-Level Interface: TTL/CMOS
- Drivers: Relays, Solenoids, Lamps, Hammers
- Battery Operated Systems, DC/DC Converters
- Solid-State Relays
- Load/Power Switching-Cell Phones, Pagers



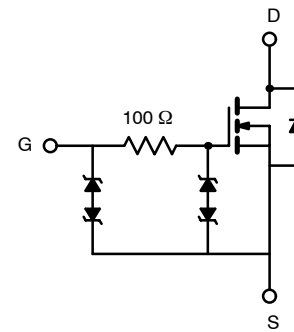
Marking Code: K2ywl

K2 = Part Number Code for TN0200K

y = Year Code

w = Week Code

l = Lot Traceability



Ordering Information: TN0200K-T1—E3 (Lead Free)

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

Parameter		Symbol	Limits	Unit
Drain-Source Voltage		V_{DS}	20	V
Gate-Source Voltage		V_{GS}	± 8	
Continuous Drain Current ($T_J = 150^\circ\text{C}$) ^b	$T_A = 25^\circ\text{C}$	I_D	0.73	A
	$T_A = 70^\circ\text{C}$		0.58	
Pulsed Drain Current ^a		I_{DM}	4	
Continuous Source Current (Diode Conduction) ^b		I_S	0.3	
Power Dissipation ^b	$T_A = 25^\circ\text{C}$	P_D	0.35	W
	$T_A = 70^\circ\text{C}$		0.22	
Operating Junction and Storage Temperature Range		T_J, T_{stg}	-55 to 150	$^\circ\text{C}$

THERMAL RESISTANCE RATINGS

Parameter	Symbol	Limits	Unit
Maximum Junction-to-Ambient ^b	R_{thJA}	357	$^\circ\text{C/W}$

Notes

- a. Pulse width limited by maximum junction temperature.
b. Surface Mounted on FR4 Board, $t \leq 10$ sec.

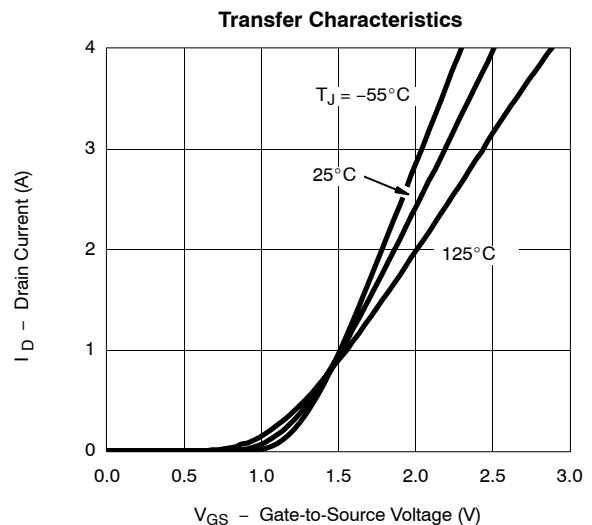
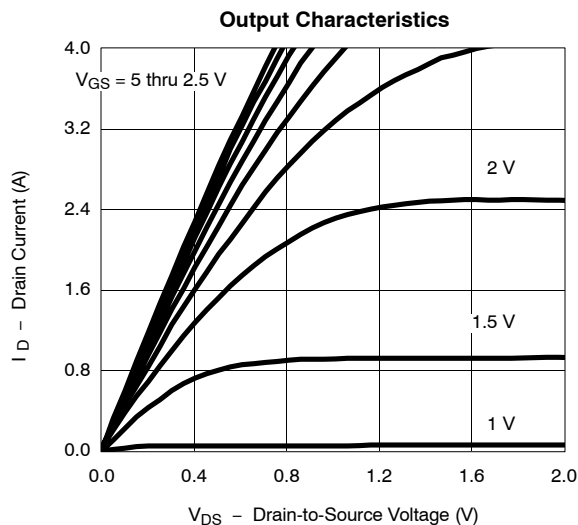
SPECIFICATIONS ($T_A = 25^\circ\text{C}$ UNLESS OTHERWISE NOTED)

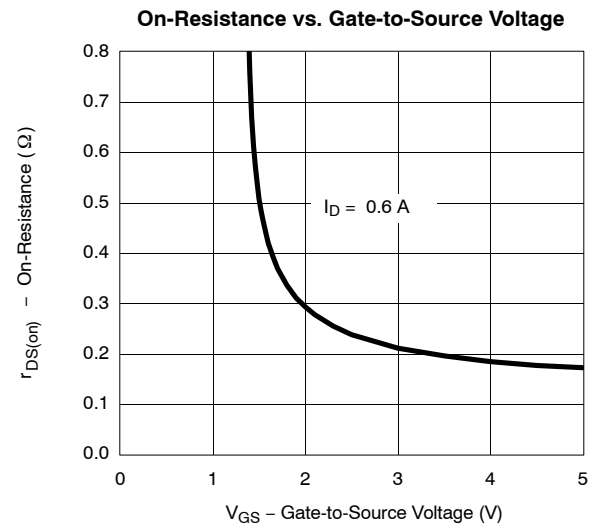
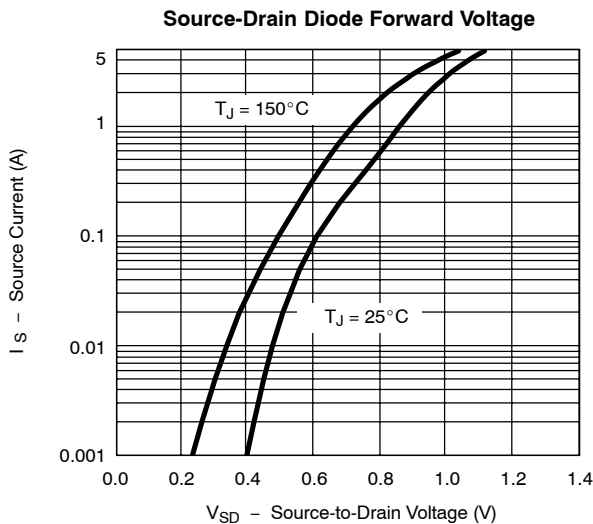
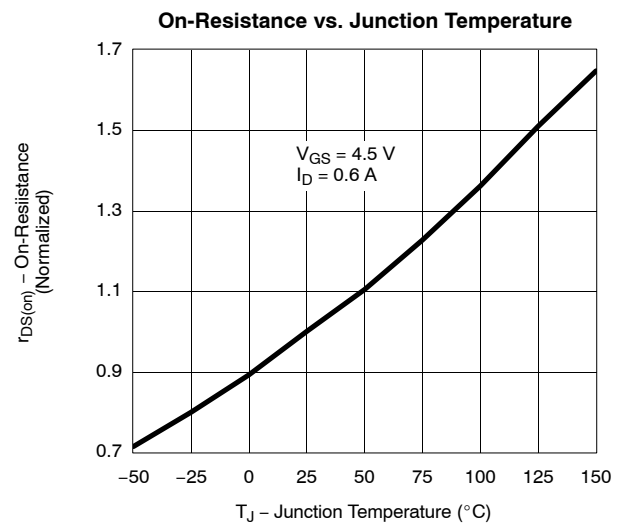
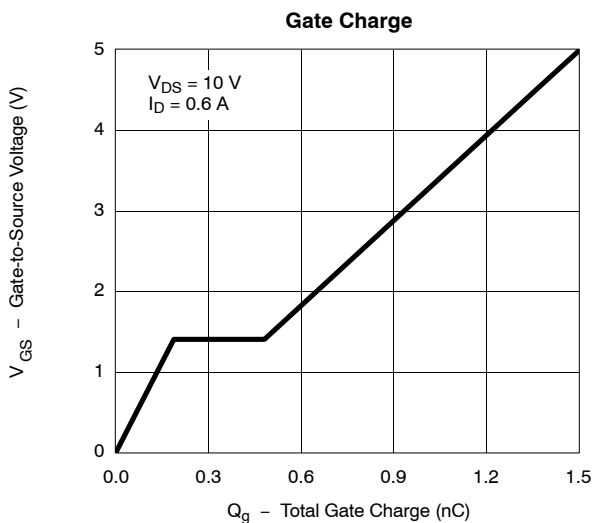
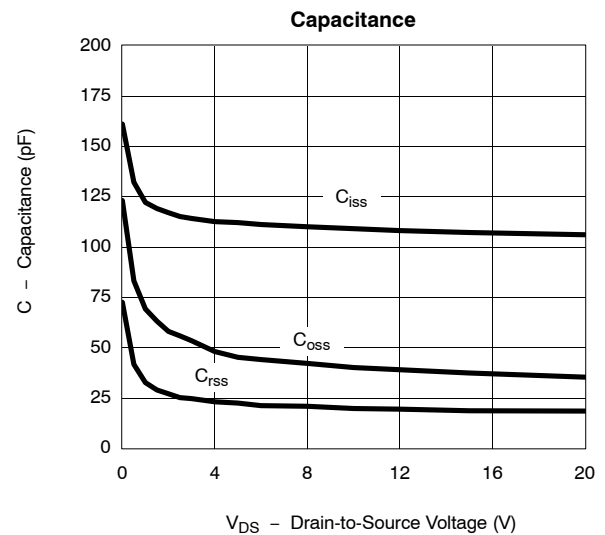
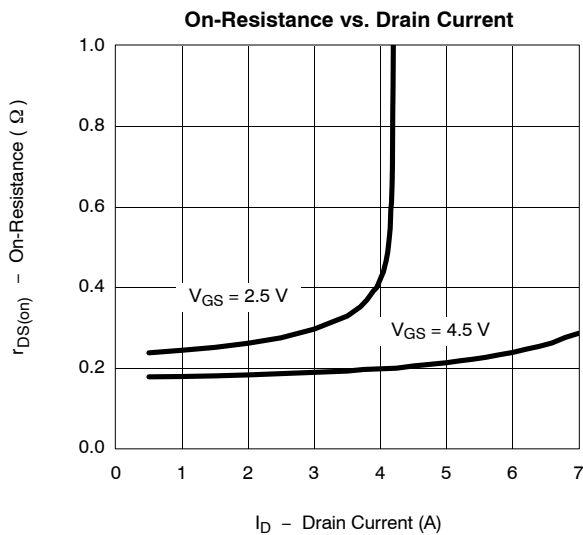
Parameter	Symbol	Test Conditions	Limits			Unit
			Min	Typ	Max	
Static						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	$V_{GS} = 0\text{ V}, I_D = 10\text{ }\mu\text{A}$	20			V
Gate-Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = 50\text{ }\mu\text{A}$	0.45	0.6	1.0	
Gate-Body Leakage	I_{GSS}	$V_{DS} = 0\text{ V}, V_{GS} = \pm 4.5\text{ V}$			± 5	μA
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS} = 20\text{ V}, V_{GS} = 0\text{ V}$			1	
		$T_J = 55^\circ\text{C}$			10	
On-State Drain Current ^a	$I_{D(on)}$	$V_{DS} \geq 5\text{ V}, V_{GS} = 4.5\text{ V}$	2.5			A
		$V_{DS} \geq 5\text{ V}, V_{GS} = 2.5\text{ V}$	1.5			
Drain-Source On-Resistance ^a	$r_{DS(on)}$	$V_{GS} = 4.5\text{ V}, I_D = 0.6\text{ A}$		0.2	0.4	Ω
		$V_{GS} = 2.5\text{ V}, I_D = 0.6\text{ A}$		0.25	0.5	
Forward Transconductance ^a	g_{fs}	$V_{DS} = 5\text{ V}, I_D = 0.6\text{ A}$		2.2		S
Diode Forward Voltage ^a	V_{SD}	$I_S = 0.3\text{ A}, V_{GS} = 0\text{ V}$		0.8	1.2	V
Dynamic ^b						
Total Gate Charge	Q_g	$V_{DS} = 10\text{ V}, V_{GS} = 4.5\text{ V}, I_D = 0.6\text{ A}$		1400	2000	pC
Gate-Source Charge	Q_{gs}			190		
Gate-Drain Charge	Q_{gd}			300		
Gate Resistance	R_g			105		Ω
Turn-On Delay Time	$t_{d(on)}$	$V_{DD} = 10\text{ V}, R_L = 16\text{ }\Omega$ $I_D \cong 0.6\text{ A}, V_{GEN} = 4.5\text{ V}, R_g = 6\text{ }\Omega$		17	25	ns
Rise Time	t_r			20	30	
Turn-Off Delay Time	$t_{d(off)}$			55	85	
Fall-Time	t_f			30	45	

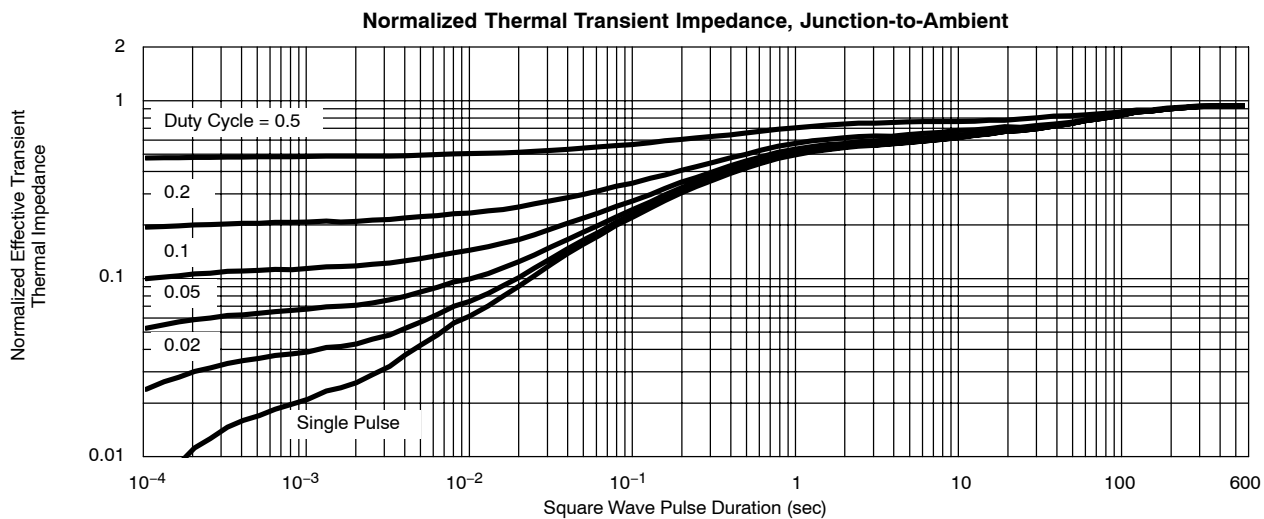
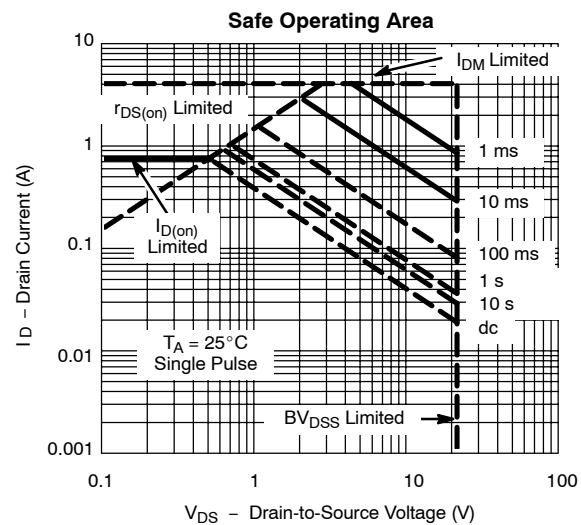
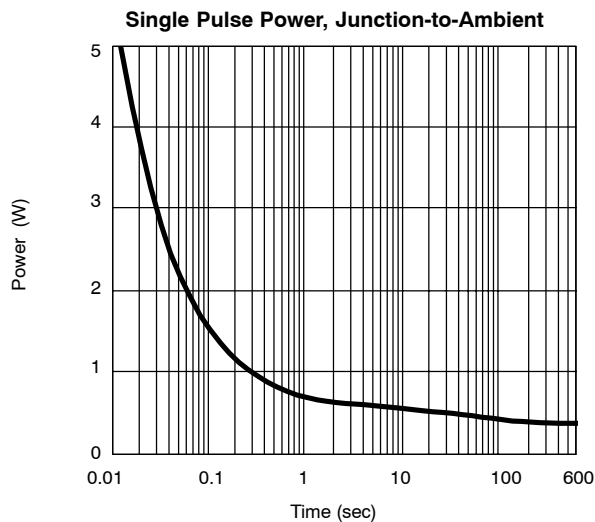
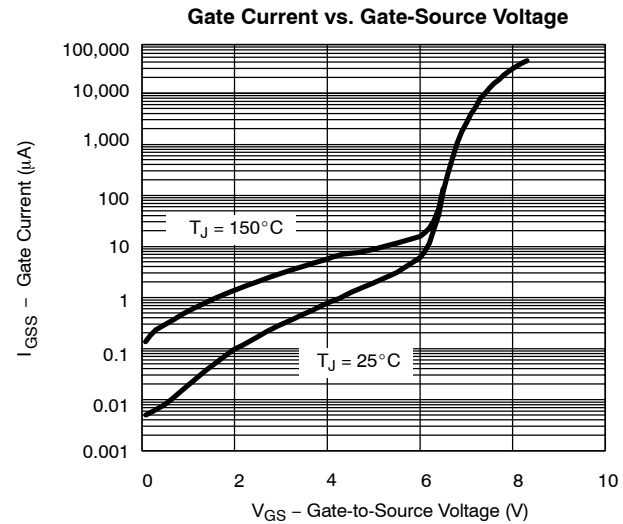
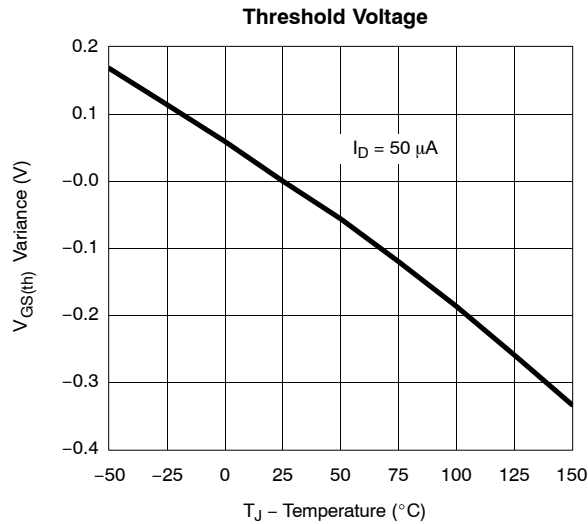
Notes

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)

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