

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

PRODUCT SUMMARY			
V _{DS} (V)	r _{DS(on)} (Ω)	I _D (A)	
		TN0200T	TN0200TS
20	0.4 @ V _{GS} = 4.5 V	0.73	1.2
	0.5 @ V _{GS} = 2.5 V	0.65	1.1

FEATURES

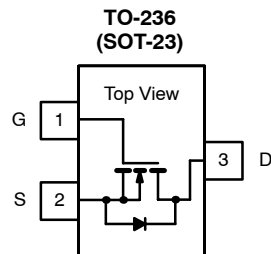
- Low On-Resistance: 0.29 Ω
- Low Threshold: 0.9 V (typ)
- 2.5-V or Lower Operation
- Fast Switching Speed: 22 ns
- Low Input and Output Leakage

BENEFITS

- Low Offset Voltage
- Low-Voltage Operation
- High-Speed Circuits
- Low Error Voltage
- Low Battery Voltage Operation

APPLICATIONS

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



Marking Code:

TN0200T: NOw//
TN0200TS: NSw//
w = Week Code
// = Lot Traceability

ABSOLUTE MAXIMUM RATINGS (T _A = 25 °C UNLESS OTHERWISE NOTED)				
Parameter	Symbol	TN0200T	TN0200TS ^c	Unit
Drain-Source Voltage	V _{DS}	20	20	V
Gate-Source Voltage	V _{GS}	±8	±8	
Continuous Drain Current (T _J = 150 °C) ^b	I _D	T _A = 25 °C	0.73	A
		T _A = 70 °C	0.58	
Pulsed Drain Current ^a	I _{DM}	4	4	
Continuous Source Current (Diode Conduction) ^b	I _S	0.6	1.0	
Power Dissipation ^b	P _D	T _A = 25 °C	0.35	W
		T _A = 70 °C	0.22	
Operating Junction and Storage Temperature Range	T _J , T _{stg}	-55 to 150		°C

THERMAL RESISTANCE RATINGS				
Parameter	Symbol	TN0200T	TN0200TS ^c	Unit
Maximum Junction-to-Ambient ^b	R _{thJA}	357	125	°C/W

Notes

- Pulse width limited by maximum junction temperature.
- Surface Mounted on FR4 Board, t ≤ 10 sec.
- Copper lead frame.

SPECIFICATIONS (T _A = 25 °C UNLESS OTHERWISE NOTED)						
Parameter	Symbol	Test Conditions	Limits			Unit
			Min	Typ	Max	
Static						
Drain-Source Breakdown Voltage	V _{(BR)DSS}	V _{GS} = 0 V, I _D = 10 μA	20	36		V
Gate-Threshold Voltage	V _{GS(th)}	V _{DS} = V _{GS} , I _D = 50 μA	0.5	0.9	1.5	
Gate-Body Leakage	I _{GSS}	V _{DS} = 0 V, V _{GS} = ±8 V			±100	nA
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} = 16 V, V _{GS} = 0 V			0.1	μA
		T _J = 85 °C			2	
On-State Drain Current ^a	I _{D(on)}	V _{DS} ≥ 5 V, V _{GS} = 4.5 V	2.5			A
		V _{DS} ≥ 5 V, V _{GS} = 2.5 V	1.5			
Drain-Source On-Resistance ^a	r _{DS(on)}	V _{GS} = 4.5 V, I _D = 0.6 A		0.29	0.4	Ω
		V _{GS} = 2.5 V, I _D = 0.6 A		0.34	0.5	
Forward Transconductance ^a	g _{fs}	V _{DS} = 5 V, I _D = 0.6 A		2.2		S
Diode Forward Voltage ^a	V _{SD}	I _S = 0.6 A, V _{GS} = 0 V		0.8	1.2	V
Dynamic						
Total Gate Charge	Q _g	V _{DS} = 10 V, V _{GS} = 4.5 V, I _D = 0.6 A		1900	2800	pC
Gate-Source Charge	Q _{gs}			50		
Gate-Drain Charge	Q _{gd}			750		
Input Capacitance	C _{iss}	V _{DS} = 10 V, V _{GS} = 0 V, f = 1 MHz		90		pF
Output Capacitance	C _{oss}			45		
Reverse Transfer Capacitance	C _{rss}			12		
Switching						
Turn-On Delay Time	t _{d(on)}	V _{DD} = 10 V, R _L = 16 Ω I _D ≈ 0.6 A, V _{GEN} = 4.5 V, R _G = 6 Ω		8	13	ns
Rise Time	t _r			14	21	
Turn-Off Delay Time	t _{d(off)}			21	30	
Fall-Time	t _f			7	11	

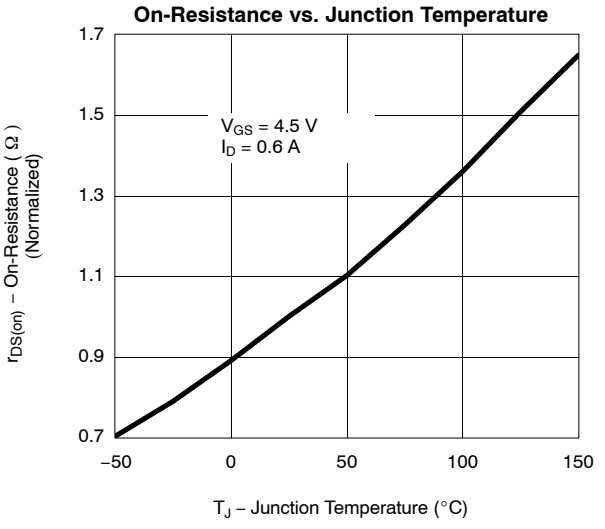
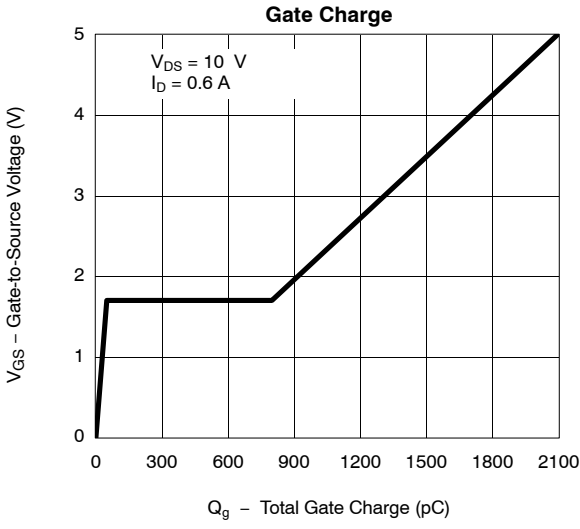
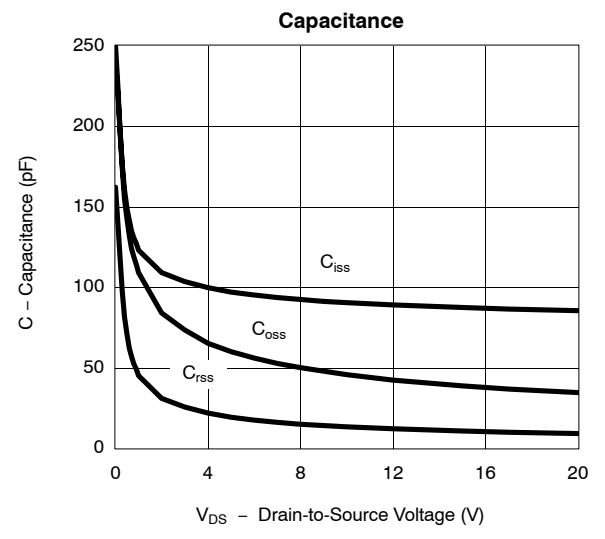
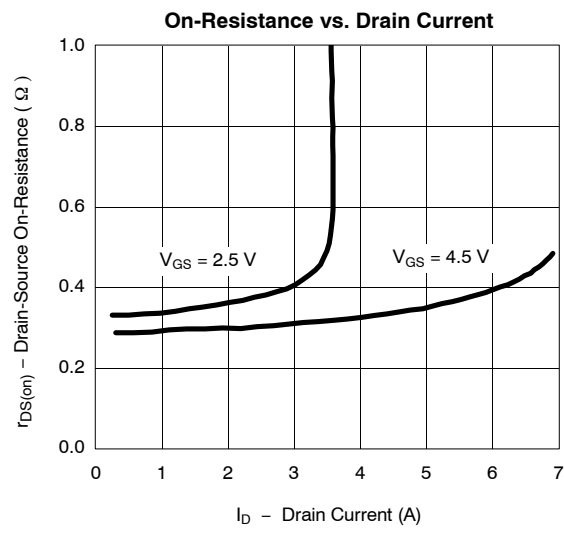
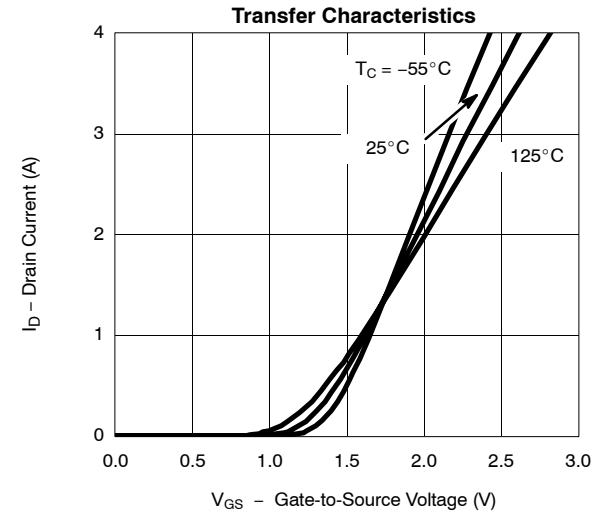
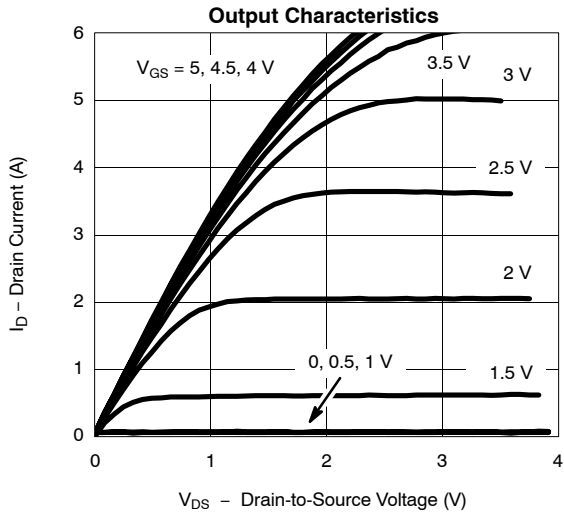
Notes

a. Pulse test: PW ≤ 300 μs duty cycle ≤ 2%.

VNLJ02



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



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