

N-Channel Enhancement-Mode MOSFET Transistor

Product Summary

$V_{(BR)DSS}$ Min (V)	$r_{DS(on)}$ Max (Ω)	$V_{GS(th)}$ (V)	I_D (A)
200	11	0.8 to 3.0	0.12

Features

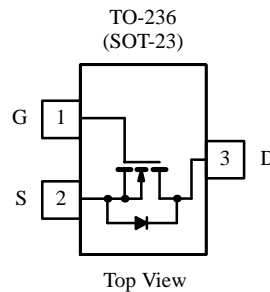
- Low On-Resistance: 9.5 Ω
- Secondary Breakdown Free: 220 V
- Low Power/Voltage Driven
- Low Input and Output Leakage
- Excellent Thermal Stability

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



Top View

TN2010T (R1)*

*Marking Code for TO-236

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

Parameter	Symbol	Limit	Unit	
Drain-Source Voltage	V_{DS}	200	V	
Gate-Source Voltage	V_{GS}	± 20		
Continuous Drain Current ($T_J = 150^\circ\text{C}$)	I_D	$T_A = 25^\circ\text{C}$	0.12	A
		$T_A = 70^\circ\text{C}$	0.08	
Pulsed Drain Current ^a	I_{DM}	0.34		
Power Dissipation	P_D	$T_A = 25^\circ\text{C}$	0.35	W
		$T_A = 70^\circ\text{C}$	0.22	
Maximum Junction-to-Ambient	R_{thJA}	357	$^\circ\text{C/W}$	
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.

Updates to this data sheet may be obtained via facsimile by calling Siliconix FaxBack, 1-408-970-5600. Please request FaxBack document #70203.

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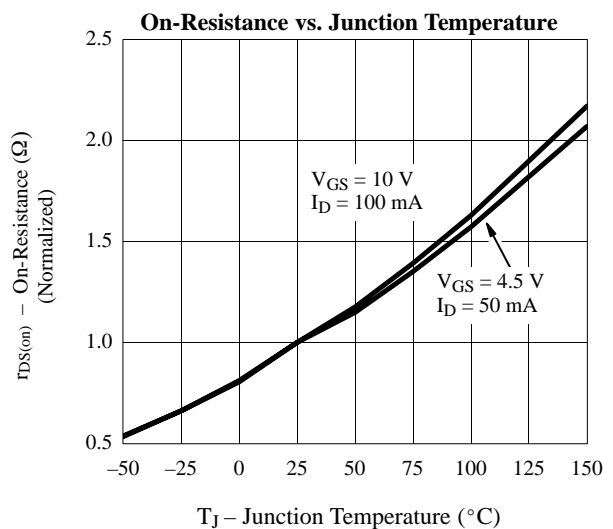
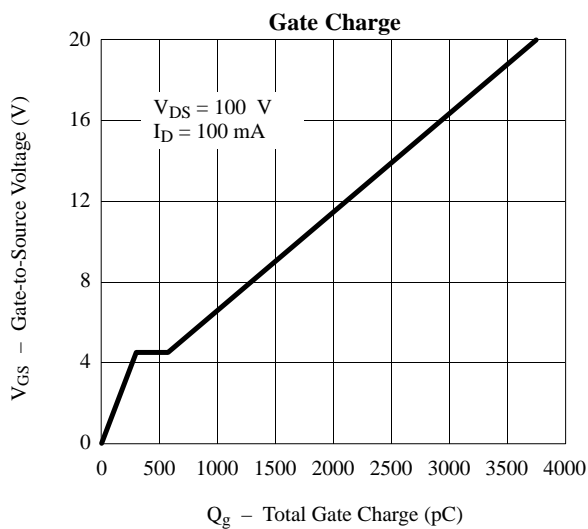
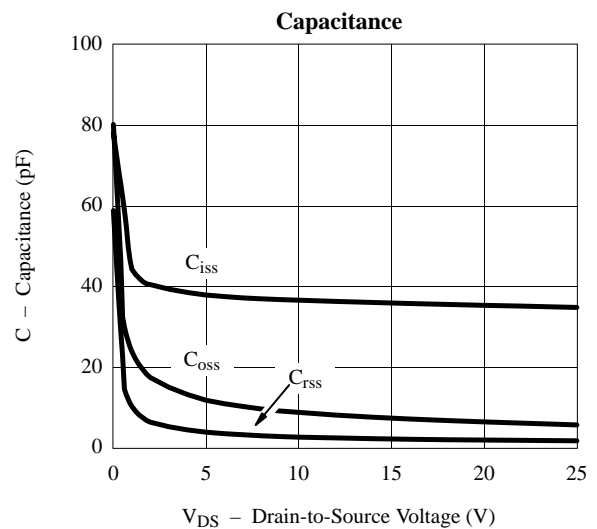
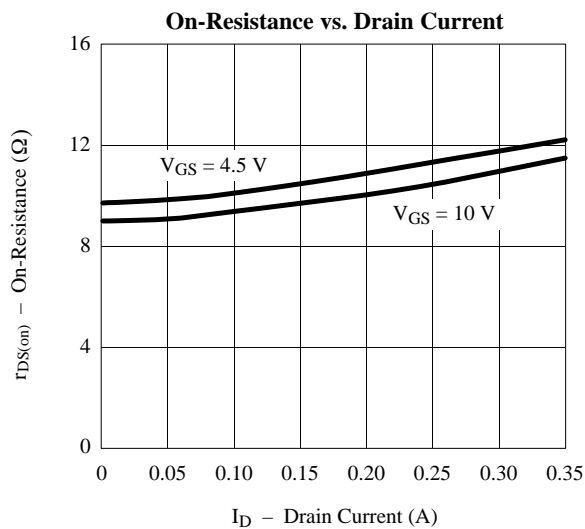
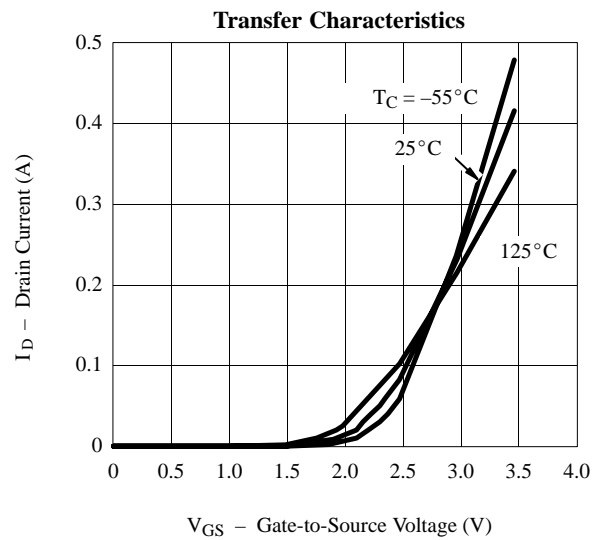
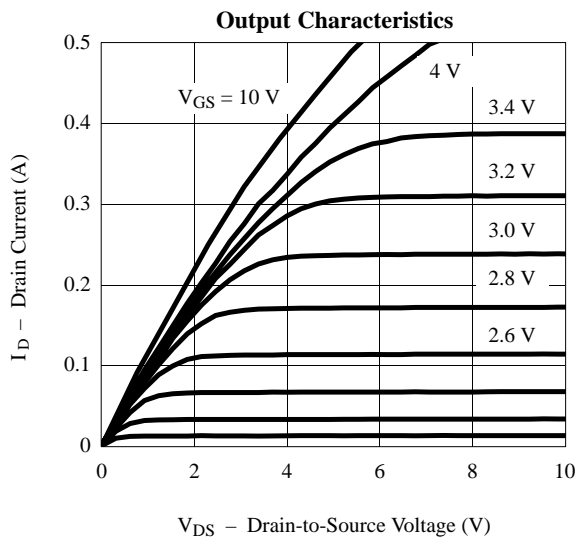
Specifications^a

Parameter	Symbol	Test Conditions	Limits			Unit
			Min	Typ ^b	Max	
Static						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	$V_{GS} = 0 \text{ V}, I_D = 100 \mu\text{A}$	200	220		V
Gate-Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = 0.25 \text{ mA}$	0.8	1.6	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}	$V_{DS} = 160 \text{ V}, V_{GS} = 0 \text{ V}$ $T_J = -55^\circ\text{C}$			1	μA
					10	
On-State Drain Current ^c	$I_{D(on)}$	$V_{DS} = 10 \text{ V}, V_{GS} = 10 \text{ V}$	0.3			mA
Drain-Source On-Resistance ^c	$r_{DS(on)}$	$V_{GS} = 10 \text{ V}, I_D = 0.1 \text{ A}$		9.5	11	Ω
		$V_{GS} = 4.5 \text{ V}, I_D = 0.05 \text{ mA}$		10	15	
Forward Transconductance ^c	g_{fs}	$V_{DS} = 10 \text{ V}, I_D = 0.1 \text{ A}$		300		mS
Diode Forward Voltage	V_{SD}	$I_S = 0.085 \text{ A}, V_{GS} = 0 \text{ V}$		0.8		V
Dynamic						
Total Gate Charge	Q_g	$V_{DS} = 100 \text{ V}, V_{GS} = 10 \text{ V}, I_D \approx 0.1 \text{ A}$		1750		pC
Gate-Source Charge	Q_{gs}			275		
Gate-Drain Charge	Q_{gd}			300		
Input Capacitance	C_{iss}	$V_{DS} = 25 \text{ V}, V_{GS} = 0 \text{ V}, f = 1 \text{ MHz}$		35		pF
Output Capacitance	C_{oss}			6		
Reverse Transfer Capacitance	C_{rss}			2		
Switching^d						
Turn-On Time	$t_{d(on)}$	$V_{DD} = 60 \text{ V}, R_L = 600 \Omega$ $I_D \approx 0.1 \text{ A}, V_{GEN} = 10 \text{ V}$ $R_G = 6 \Omega$		4		ns
	t_r			16		
Turn-Off Time	$t_{d(off)}$			16		
	t_f			45		

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.

Typical Characteristics (25°C Unless Otherwise Noted)



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