



P-Channel 20-V (D-S) MOSFET, Low-Threshold

PRODUCT SUMMARY			
V _{DS} (V)	r _{DS(on)} (Ω)	I _D (A)	
		TP0101T	TP0101TS
-20	0.65 @ V _{GS} = -4.5 V	-0.6	-1.0
	0.85 @ V _{GS} = -2.5 V	-0.5	-0.9

FEATURES

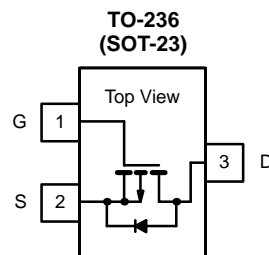
- High-Side Switching
- Low On-Resistance: 0.45 Ω
- Low Threshold: 0.9 V (typ)
- Fast Switching Speed: 32 ns
- 2.5-V or Lower Operation

BENEFITS

- Ease in Driving Switches
- Low Offset (Error) Voltage
- Low-Voltage Operation
- High-Speed Circuits
- Low Battery Voltage Operation

APPLICATIONS

- Drivers: Relays, Solenoids, Lamps, Hammers, Displays, Memories
- Battery Operated Systems, DC/DC Converters
- Power Supply Converter Circuits
- Load/Power Switching—Cell Phones, Pagers



Marking Code:

TP0101T: POw//
TP0101TS: PSw//

w = Week Code
/ = Lot Traceability

ABSOLUTE MAXIMUM RATINGS (T _A = 25°C UNLESS OTHERWISE NOTED)				
Parameter	Symbol	TP0101T	TP0101TS ^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	-0.6	A
		T _A = 70°C	-0.48	
Pulsed Drain Current ^a	I _{DM}	-3	-3	W
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	-55 to 150	°C

THERMAL RESISTANCE RATINGS				
Parameter	Symbol	TP0101T	TP0101TS ^c	Unit
Thermal Resistance, 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	-26		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} = -9.6 V, V _{GS} = 0 V			-1	μA
		T _J = 55 °C			-10	
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	-0.5			
Drain-Source On-Resistance ^a	r _{DS(on)}	V _{GS} = -4.5 V, I _D = -0.6 A		0.45	0.65	Ω
		V _{GS} = -2.5 V, I _D = -0.5 A		0.69	0.85	
Forward Transconductance ^a	g _{fs}	V _{DS} = -5 V, I _D = -0.6 A		1300		mS
Diode Forward Voltage ^a	V _{SD}	I _S = -0.6 A, V _{GS} = 0 V		-0.9	-1.2	V
Dynamic						
Total Gate Charge	Q _g	V _{DS} = -6 V, V _{GS} = -4.5 V I _D ≅ -0.6 A		2020	3000	pC
Gate-Source Charge	Q _{gs}			180		
Gate-Drain Charge	Q _{gd}			720		
Input Capacitance	C _{iss}	V _{DS} = -6 V, V _{GS} = 0, f = 1 MHz		110		pF
Output Capacitance	C _{oss}			80		
Reverse Transfer Capacitance	C _{rss}			30		
Switching						
Turn-On Time	t _{d(on)}	V _{DD} = -6 V, R _L = 12 Ω I _D ≅ -0.6 A, V _{GEN} = -4.5 V R _G = 6 Ω		7	12	ns
	t _r			25	35	
Turn-Off Time	t _{d(off)}			19	30	
	t _f			9	15	

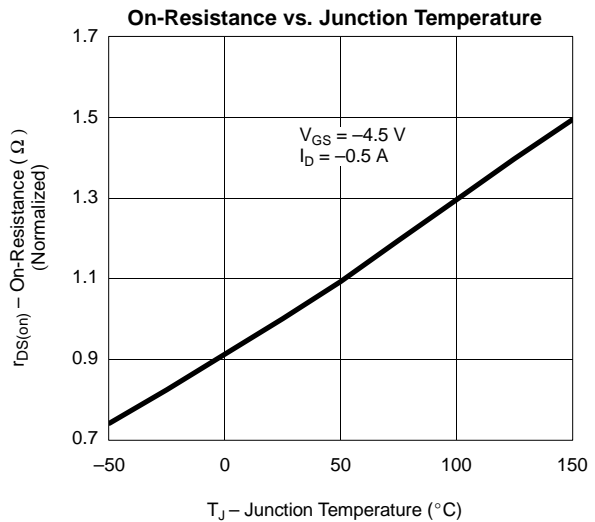
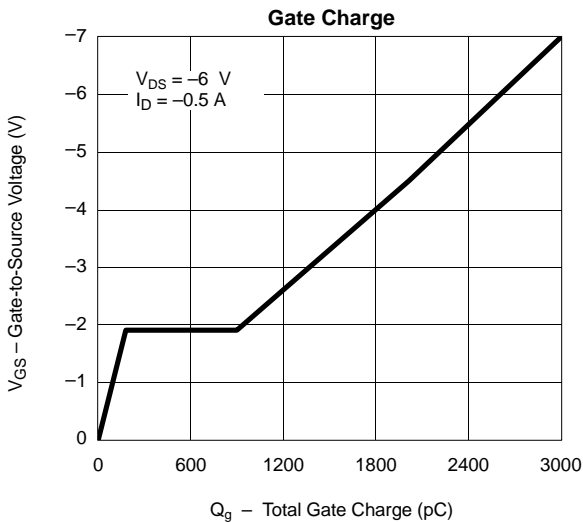
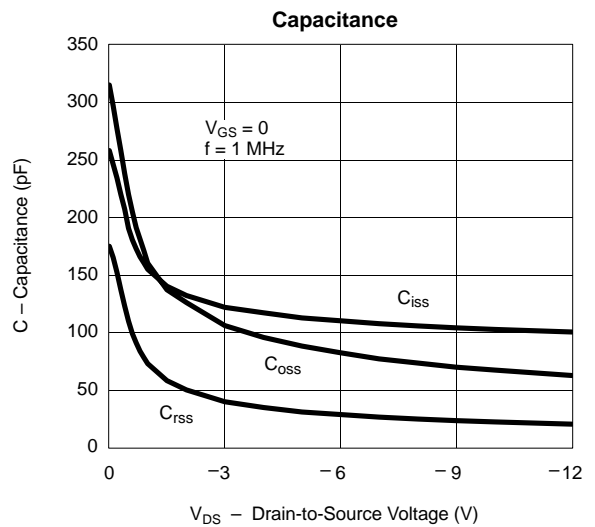
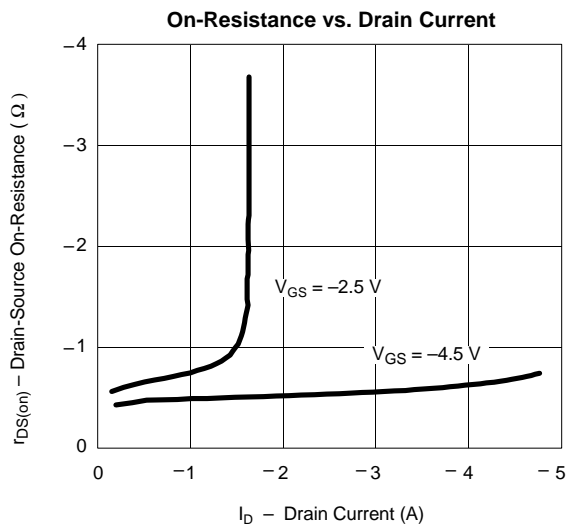
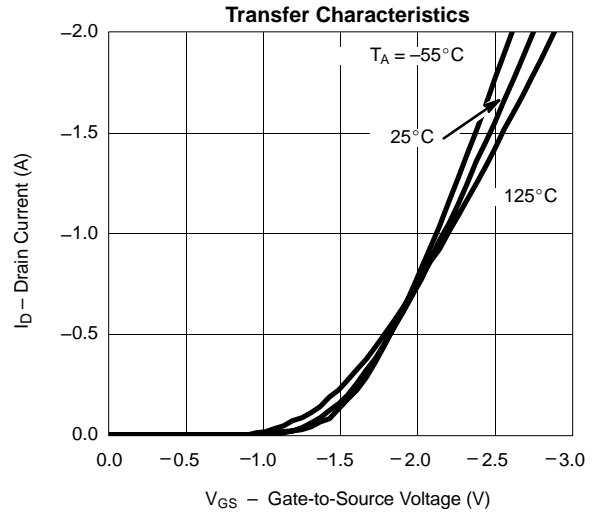
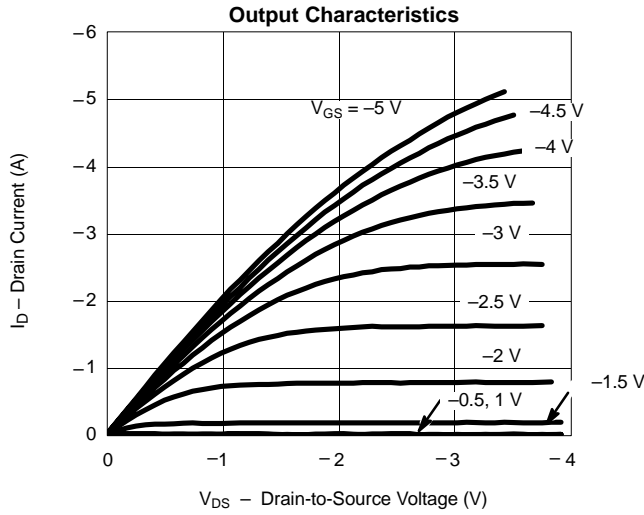
Notes

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

VPLJ01



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



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