



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

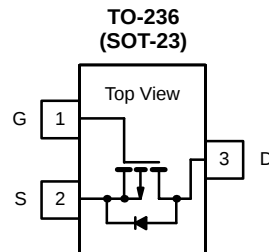
- High-Side Switching
- Low On-Resistance: 0.45 Ω
- Low Threshold: 0.9 V (typ)
- Fast Switching Speed: 32 ns
- 2.5-V or Lower Operation

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
l = Lot Traceability

ABSOLUTE MAXIMUM RATINGS ($T_A = 25^\circ\text{C}$ 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 ($T_J = 150^\circ\text{C}$) ^b	I_D	-0.6	-1.0	A
		-0.48	-0.8	
Pulsed Drain Current ^a	I_{DM}	-3	-3	
Continuous Source Current (Diode Conduction) ^b	I_S	-0.6	-1.0	
Power Dissipation ^b	P_D	0.35	1.0	W
		0.22	0.65	
Operating Junction and Storage Temperature Range	T_J, T_{stg}	-55 to 150	-55 to 150	$^\circ\text{C}$

THERMAL RESISTANCE RATINGS

Parameter	Symbol	TP0101T	TP0101TS ^c	Unit
Thermal Resistance, Junction-to-Ambient ^b	R_{thJA}	357	125	$^\circ\text{C/W}$

Notes

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

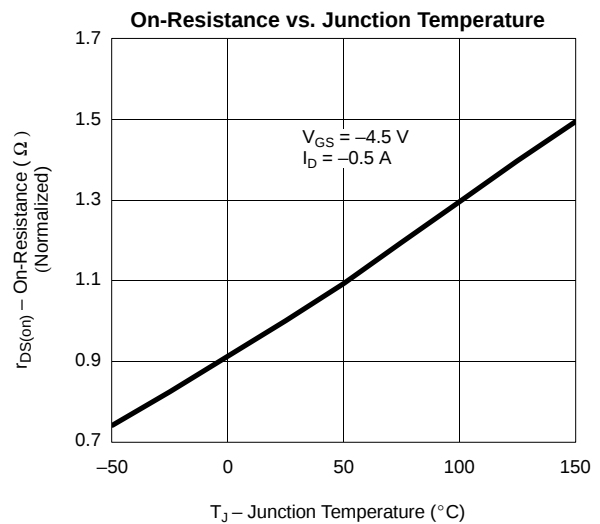
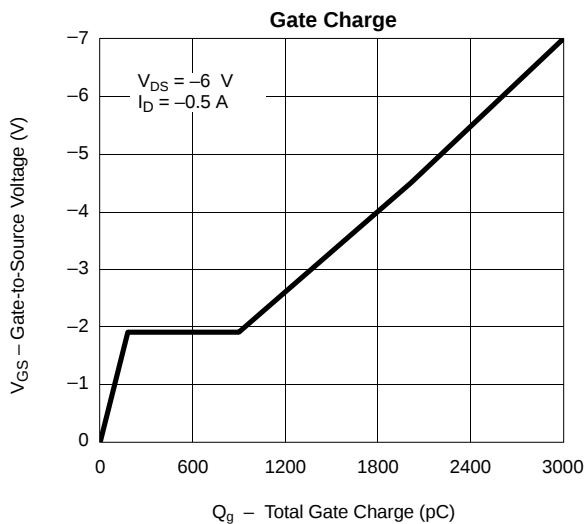
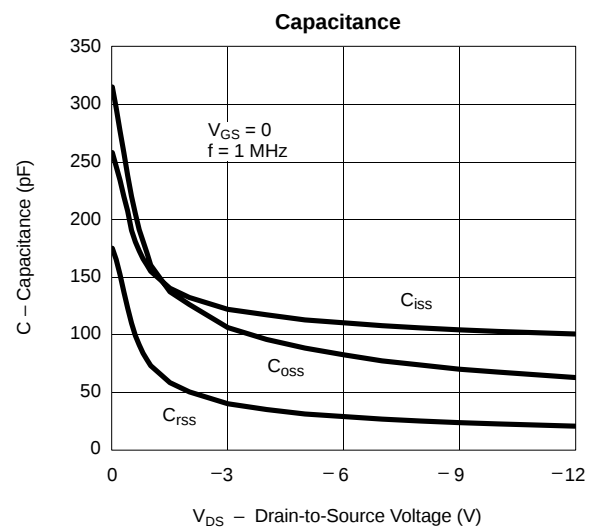
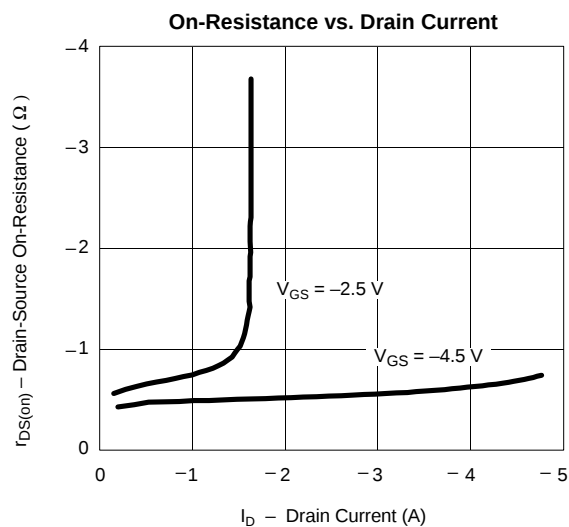
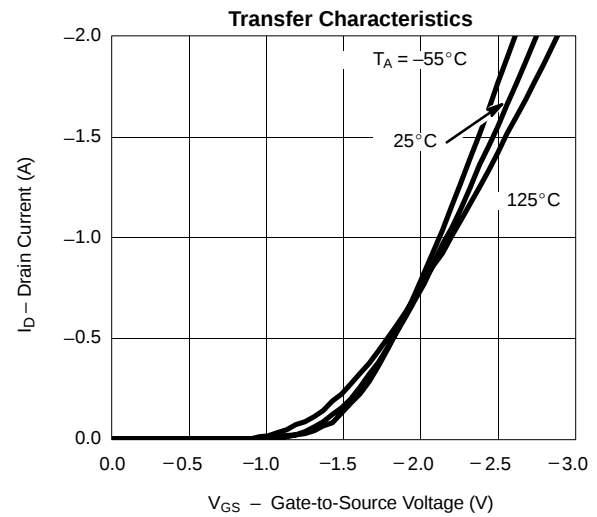
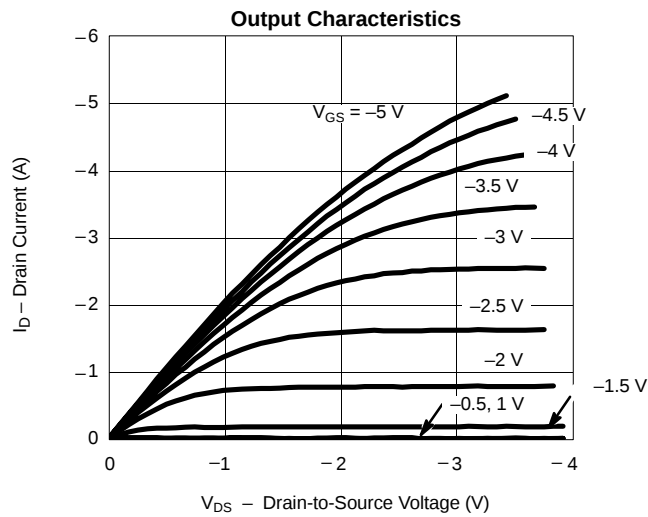
Notes

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

VPLJ01



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



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