

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

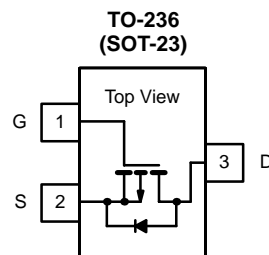
- High-Side Switching
- Low On-Resistance: 0.45 Ω
- Low Threshold: 0.9 V (typ)
- Fast Switching Speed: 32 ns
- 2.5-V or Lower Operation

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	-1.0
		T _A = 70°C	-0.48	-0.8
Pulsed Drain Current ^a	I _{DM}	-3	-3	A
Continuous Source Current (Diode Conduction) ^b	I _S	-0.6	-1.0	
Power Dissipation ^b	P _D	T _A = 25°C	0.35	1.0
		T _A = 70°C	0.22	0.65
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
 a. Pulse width limited by maximum junction temperature.
 b. Surface Mounted on FR4 Board, t ≤ 10 sec.
 c. Copper lead frame.

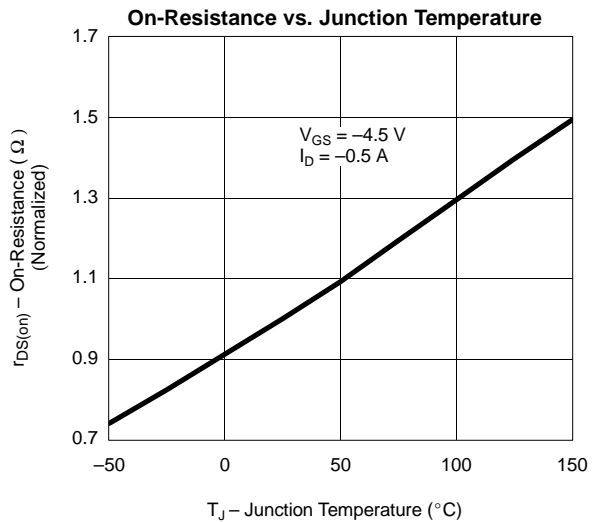
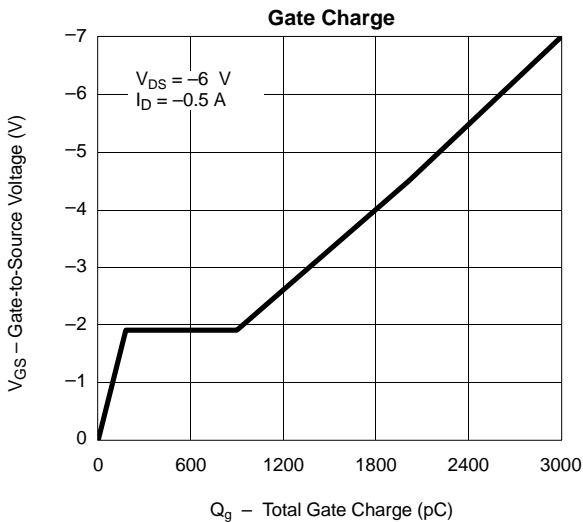
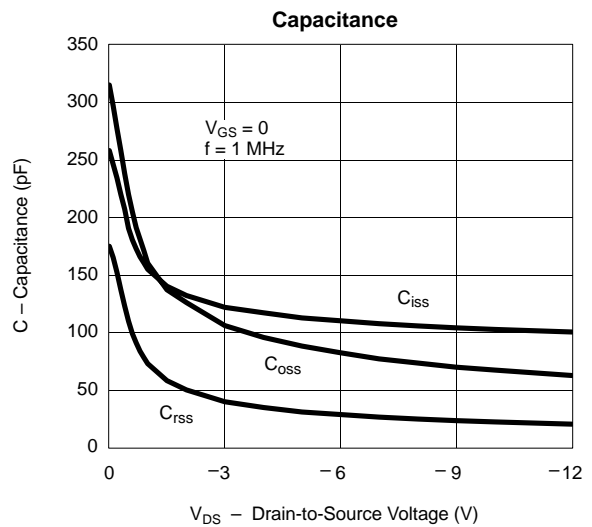
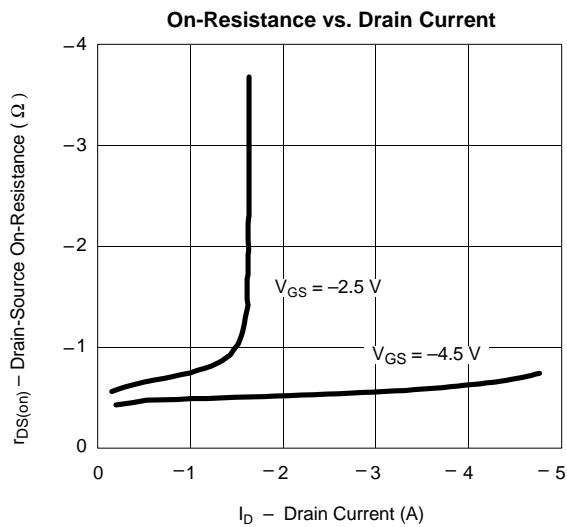
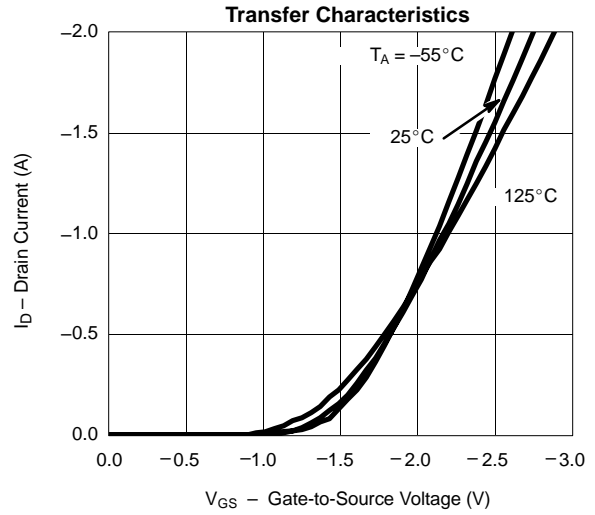
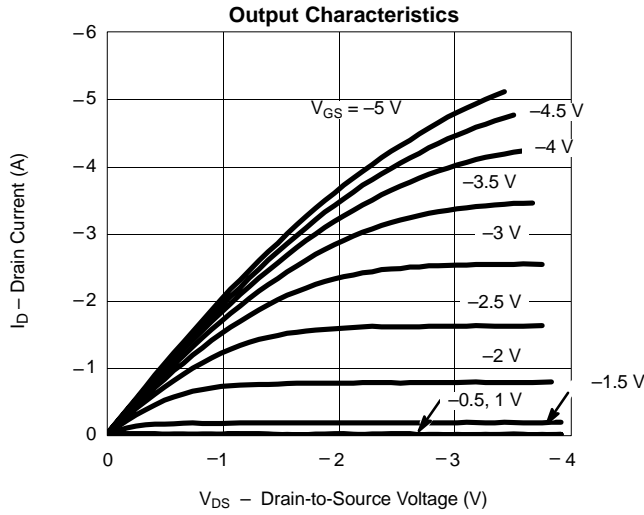
SPECIFICATIONS ($T_A = 25^\circ\text{C}$ UNLESS OTHERWISE NOTED)						
Parameter	Symbol	Test Conditions	Limits			Unit
			Min	Typ	Max	
Static						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	$V_{GS} = 0\text{ V}, I_D = -10\ \mu\text{A}$	-20	-26		V
Gate-Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = -50\ \mu\text{A}$	-0.5	-0.9	-1.5	
Gate-Body Leakage	I_{GSS}	$V_{DS} = 0\text{ V}, V_{GS} = \pm 8\text{ V}$			± 100	nA
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS} = -9.6\text{ V}, V_{GS} = 0\text{ V}$			-1	μA
		$T_J = 55^\circ\text{C}$			-10	
On-State Drain Current ^a	$I_{D(on)}$	$V_{DS} \leq -5\text{ V}, V_{GS} = -4.5\text{ V}$	-2.5			A
		$V_{DS} \leq -5\text{ V}, V_{GS} = -2.5\text{ V}$	-0.5			
Drain-Source On-Resistance ^a	$r_{DS(on)}$	$V_{GS} = -4.5\text{ V}, I_D = -0.6\text{ A}$		0.45	0.65	Ω
		$V_{GS} = -2.5\text{ V}, I_D = -0.5\text{ A}$		0.69	0.85	
Forward Transconductance ^a	g_{fs}	$V_{DS} = -5\text{ V}, I_D = -0.6\text{ A}$		1300		mS
Diode Forward Voltage ^a	V_{SD}	$I_S = -0.6\text{ A}, V_{GS} = 0\text{ V}$		-0.9	-1.2	V
Dynamic						
Total Gate Charge	Q_g	$V_{DS} = -6\text{ V}, V_{GS} = -4.5\text{ V}$ $I_D \cong -0.6\text{ A}$		2020	3000	pC
Gate-Source Charge	Q_{gs}			180		
Gate-Drain Charge	Q_{gd}			720		
Input Capacitance	C_{iss}	$V_{DS} = -6\text{ V}, V_{GS} = 0, f = 1\text{ MHz}$		110		pF
Output Capacitance	C_{oss}			80		
Reverse Transfer Capacitance	C_{rss}			30		
Switching						
Turn-On Time	$t_{d(on)}$	$V_{DD} = -6\text{ V}, R_L = 12\ \Omega$ $I_D \cong -0.6\text{ A}, V_{GEN} = -4.5\text{ V}$ $R_G = 6\ \Omega$		7	12	ns
	t_r			25	35	
Turn-Off Time	$t_{d(off)}$			19	30	
	t_f			9	15	

Notes

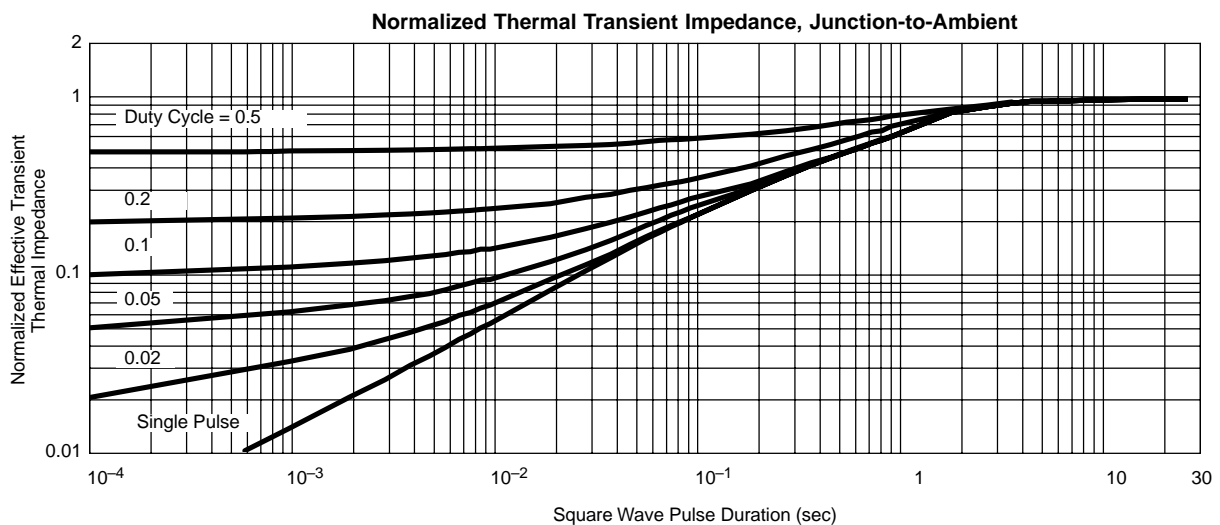
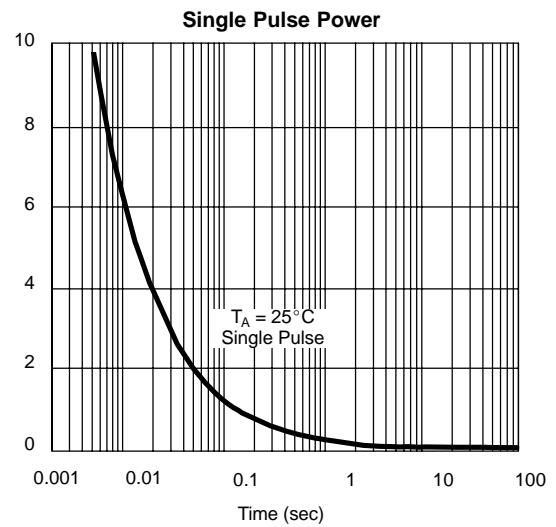
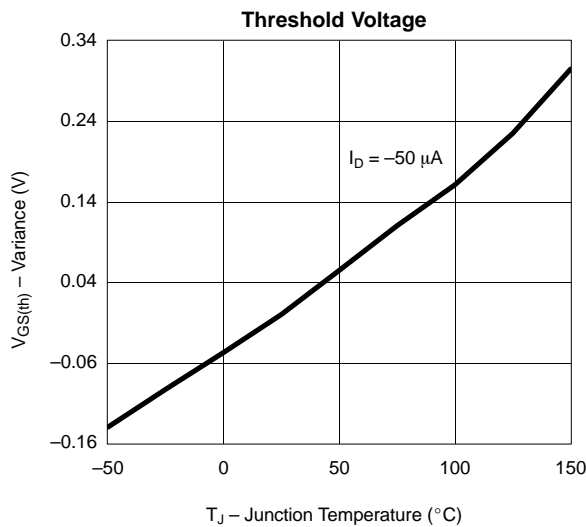
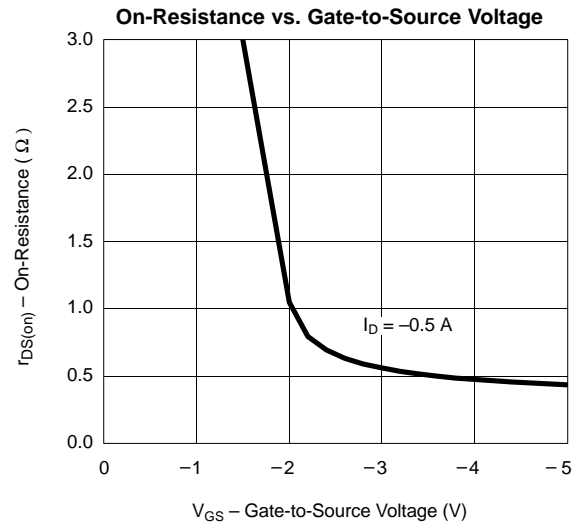
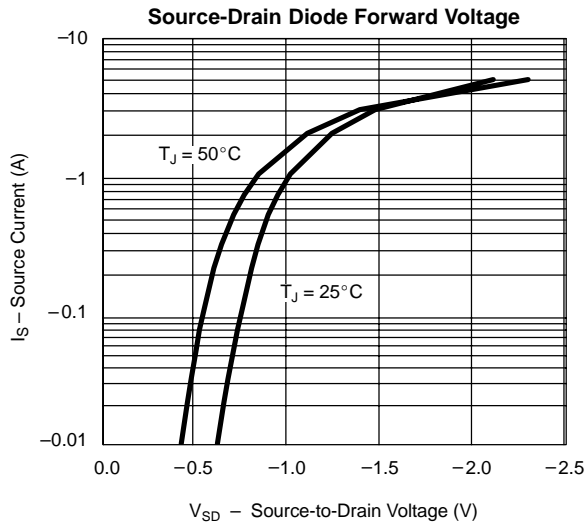
a. Pulse test: $PW \leq 300\ \mu\text{s}$ duty cycle $\leq 2\%$.

VPLJ01

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



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