



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

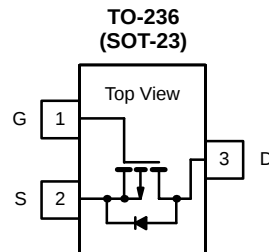
- High-Side Switching
- Low On-Resistance: 0.45 Ω
- Low Threshold: 0.9 V (typ)
- Fast Switching Speed: 32 ns
- 2.5-V or Lower Operation

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	

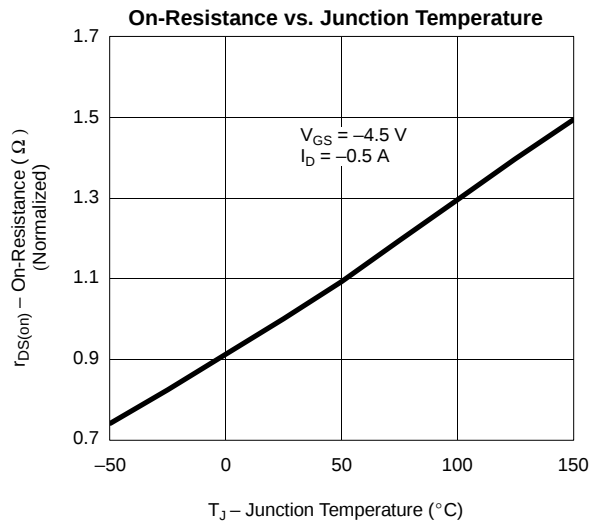
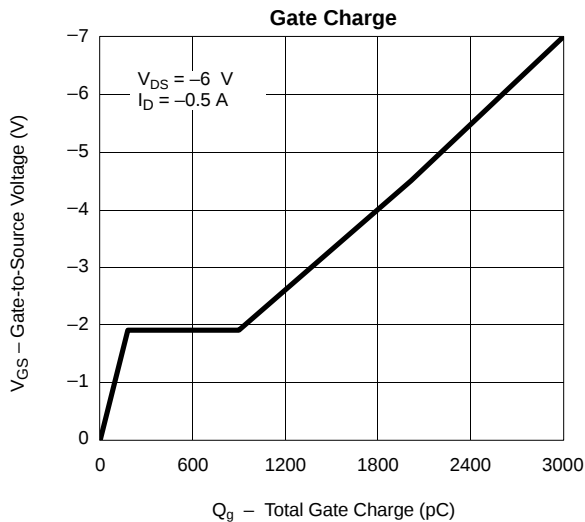
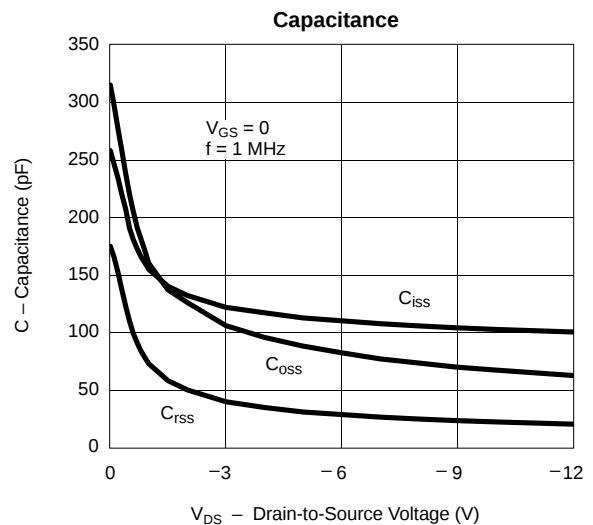
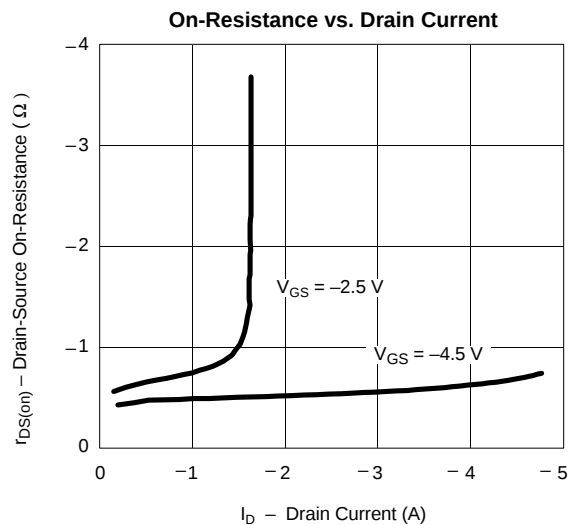
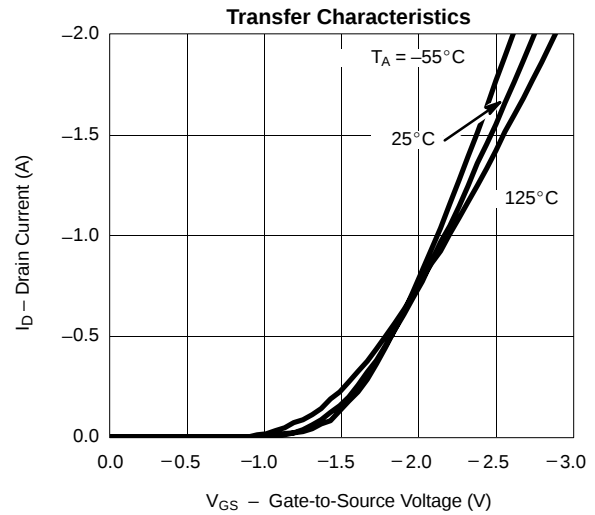
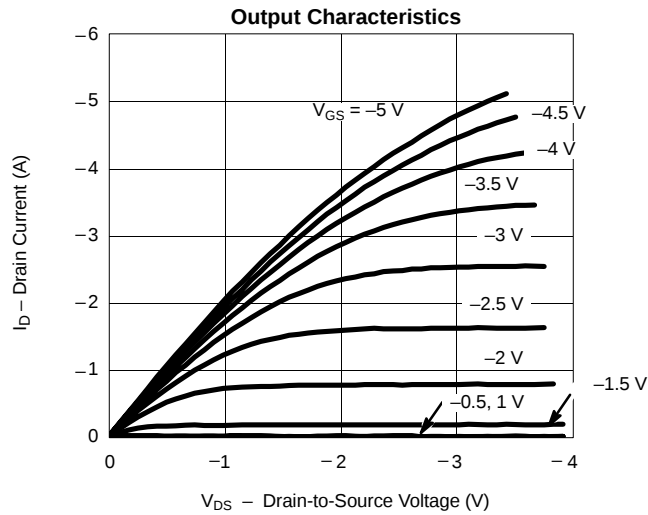
Notes

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

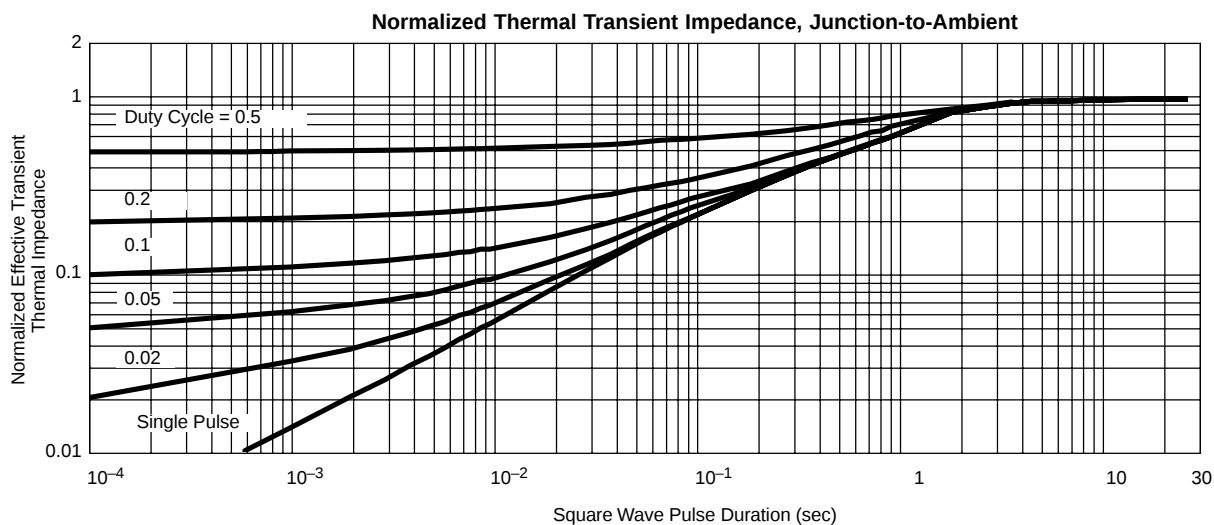
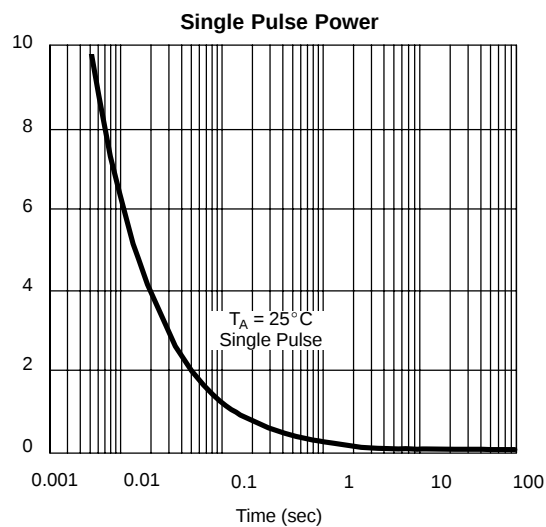
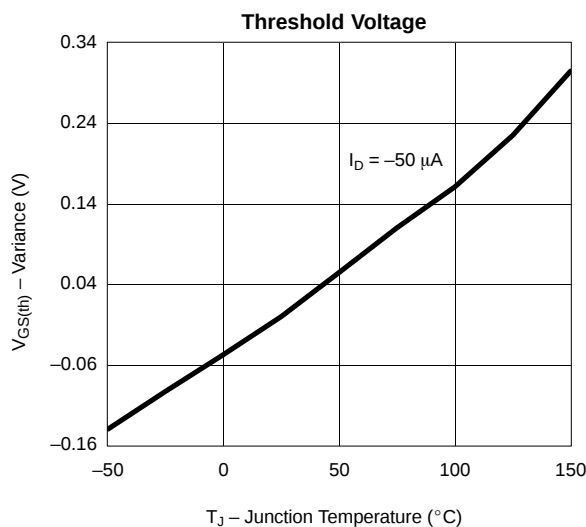
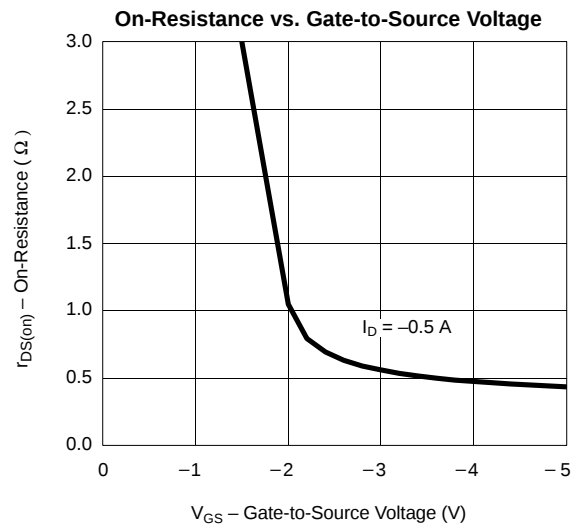
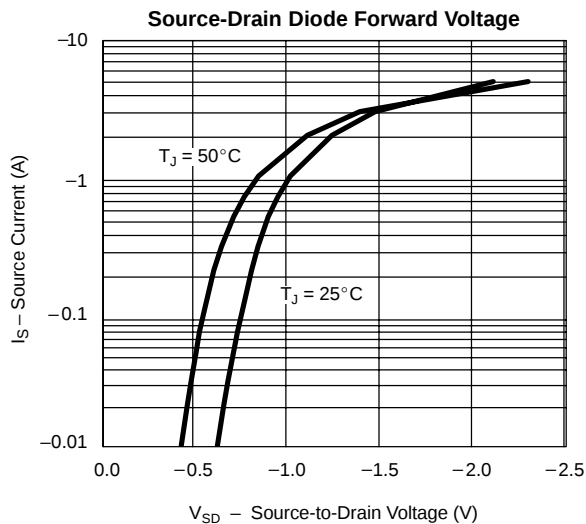
VPLJ01



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



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





Disclaimer

All product specifications and data are subject to change without notice.

Vishay Intertechnology, Inc., its affiliates, agents, and employees, and all persons acting on its or their behalf (collectively, "Vishay"), disclaim any and all liability for any errors, inaccuracies or incompleteness contained herein or in any other disclosure relating to any product.

Vishay disclaims any and all liability arising out of the use or application of any product described herein or of any information provided herein to the maximum extent permitted by law. The product specifications do not expand or otherwise modify Vishay's terms and conditions of purchase, including but not limited to the warranty expressed therein, which apply to these products.

No license, express or implied, by estoppel or otherwise, to any intellectual property rights is granted by this document or by any conduct of Vishay.

The products shown herein are not designed for use in medical, life-saving, or life-sustaining applications unless otherwise expressly indicated. Customers using or selling Vishay products not expressly indicated for use in such applications do so entirely at their own risk and agree to fully indemnify Vishay for any damages arising or resulting from such use or sale. Please contact authorized Vishay personnel to obtain written terms and conditions regarding products designed for such applications.

Product names and markings noted herein may be trademarks of their respective owners.