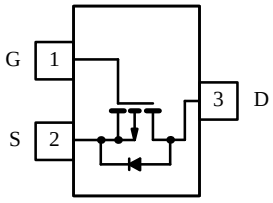
P-Channel Enchancement-Mode MOSFET

Product Summary

V_{DS} (V)	$r_{DS(on)}$ (Ω)	I_D (A)
–12	0.65 @ V_{GS} = –4.5 V	–0.5
	0.85 @ V_{GS} = –2.5 V	–0.4

TO-236
(SOT-23)



Top View

TP0101T (P0)*

*Marking Code for TO-236

Absolute Maximum Ratings (T_A = 25°C Unless Otherwise Noted)

Parameter		Symbol	Limit	Unit
Drain-Source Voltage		V_{DS}	–12	V
Gate-Source Voltage		V_{GS}	± 8	
Continuous Drain Current (T_J = 150°C)[b]	T_A= 25°C	I_D	–0.5	A
	T_A= 70°C		–0.39	
Pulsed Drain Current[a]		I_{DM}	–3	
Continuous Source Current (Diode Conduction)[b]		I_S	–0.5	
Power Dissipation[b]	T_A= 25°C	P_D	0.23	W
	T_A= 70°C		0.15	
Operating Junction and Storage Temperature Range		T_J, T_{stg}	–55 to 150	°C

Thermal Resistance Ratings

Parameter	Symbol	Limit	Unit
Maximum Junction-to-Ambient[b]	R_{thJA}	550	°C/W

Notes
a. Pulse width limited by maximum junction temperature.
b. Surface Mounted on FR4 Board, t ≤ 10 sec.

Subsequent updates to this data sheet may be obtained via facsimile by calling Siliconix FaxBack, 1-408-970-5600. Please request FaxBack document #2833. A SPICE Model data sheet is available for this product (FaxBack document #5154).

New Product

Specifications[a]

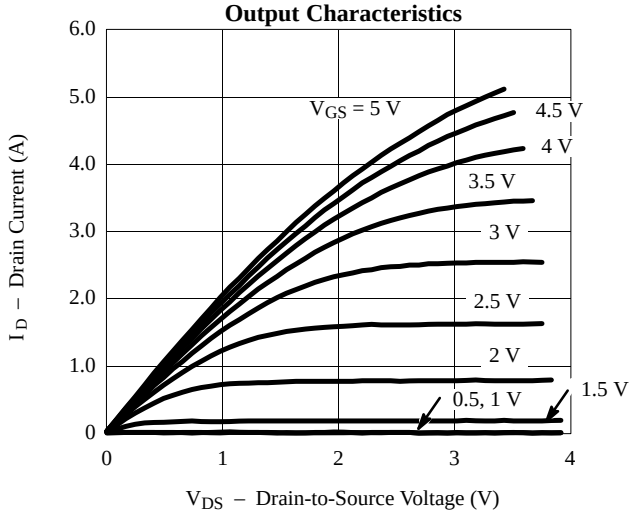
Parameter	Symbol	Test Conditions	Limits Min	Limits Typ	Limits Max	Unit
Static						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	V_{GS} = 0 V, I_D = –10 µA	–12	–25		V
Gate-Threshold Voltage	$V_{GS(th)}$	V_{DS} = V_{GS}, I_D = –50 µA	–0.65			V
Gate-Body Leakage	I_{GSS}	V_{DS} = 0 V, V_{GS} = ±8 V			±100	nA
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS} = –9.6 V, V_{GS} = 0 V			–1	µA
		T_J = 55°C			–10	µA
On-State Drain Current[c]	$I_{D(on)}$	V_{DS} ≤ –5 V, V_{GS} = –4.5 V	–2.5			A
		V_{DS} ≤ –5 V, V_{GS} = –2.5 V	–0.5			A
Drain-Source On-Resistance[c]	$r_{DS(on)}$	V_{GS} = –4.5 V, I_D = –0.5 A		0.45	0.65	Ω
		V_{GS} = –2.5 V, I_D = –0.4 A		0.69	0.85	Ω
Forward Transconductance[c]	g_{fs}	V_{DS} = –5 V, I_D = –0.5 A		1.3		S
Diode Forward Voltage	V_{SD}	I_S = –0.5 A, V_{GS} = 0 V		–0.9	–1.2	V
Dynamic[b]						
Total Gate Charge	Q_g	V_{DS} = –6 V, V_{GS} = –4.5 V I_D ≅ –0.5 A		2020	3000	pC
Gate-Source Charge	Q_{gs}			180		pC
Gate-Drain Charge	Q_{gd}			720		pC
Input Capacitance	C_{iss}	V_{DS} = –6 V, V_{GS} = 0, f = 1 MHz		110		pF
Output Capacitance	C_{oss}			80		pF
Reverse Transfer Capacitance	C_{rss}			30		pF
Switching[d]						
Turn-On Time	$t_{d(on)}$	V_{DD} = –6 V, R_L = 12 Ω I_D ≅ –0.5 A, V_{GEN} = –4.5 V R_G = 6 Ω		7	12	ns
	t_r			25	35	ns
Turn-Off Time	$t_{d(off)}$			19	30	ns
	t_f			9	15	ns

Notes
a. T_A = 25°C unless otherwise noted.
b. For DESIGN AID ONLY, not subject to production testing.
c. Pulse test: PW ≤ 300 µs duty cycle ≤ 2%.
d. Switching time is essentially independent of operating temperature.

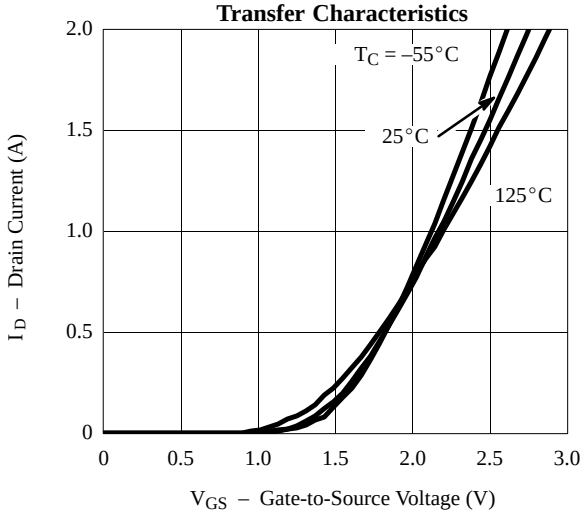
VPLJ01

Typical Characteristics (25°C Unless Otherwise Noted)

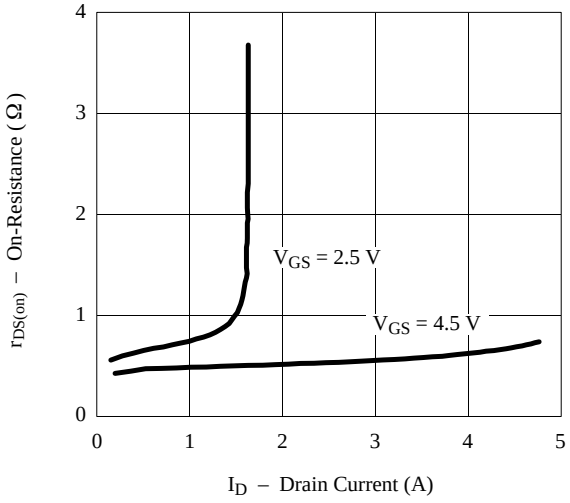
Output Characteristics



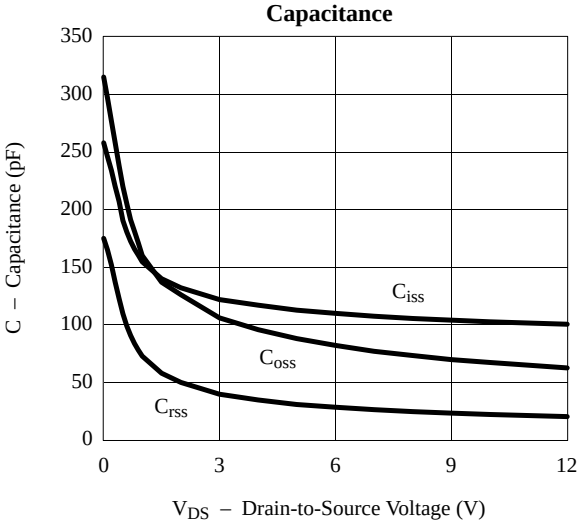
Transfer Characteristics



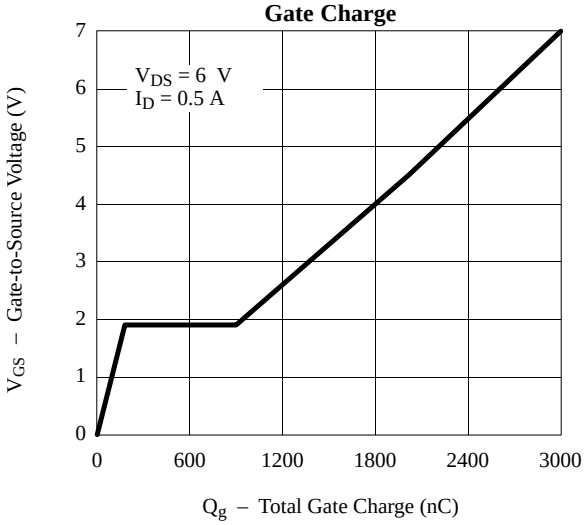
On-Resistance vs. Drain Current



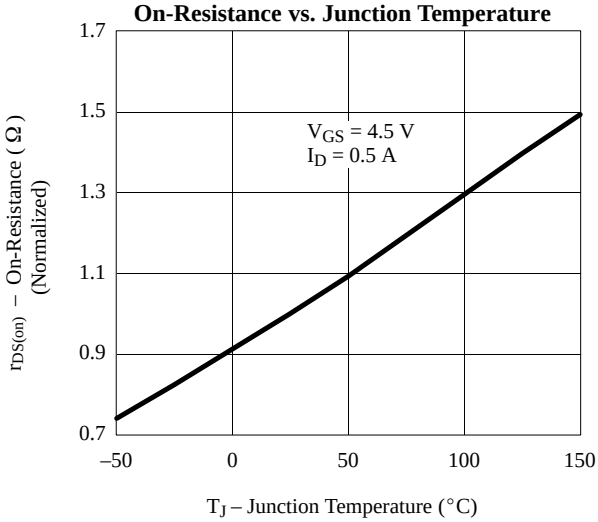
Capacitance



Gate Charge

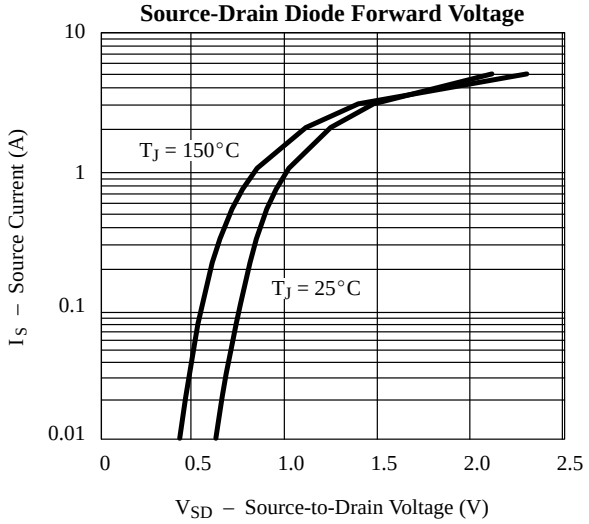


On-Resistance vs. Junction Temperature

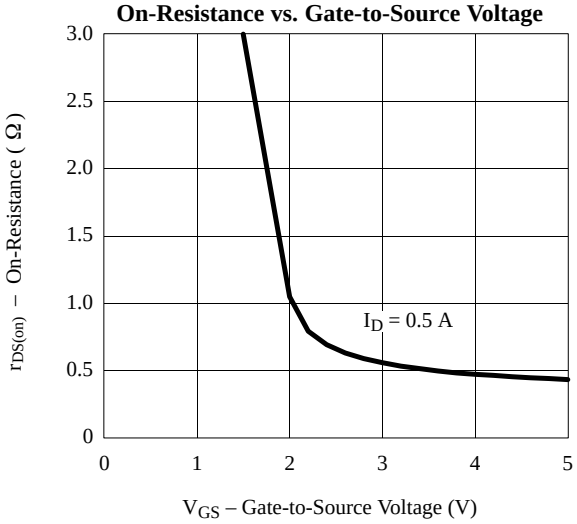


Typical Characteristics (25°C Unless Otherwise Noted)

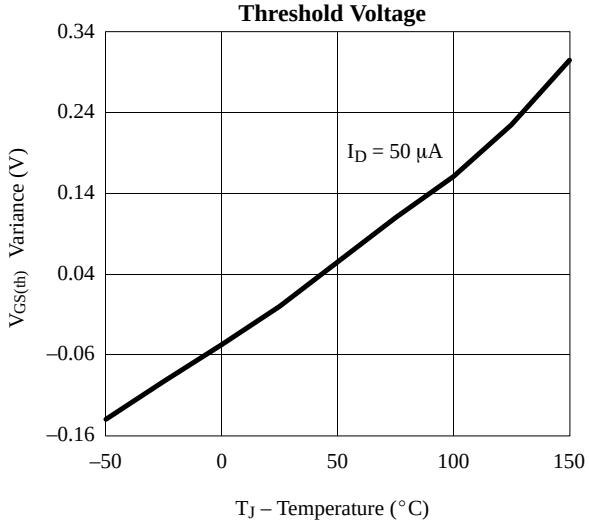
Source-Drain Diode Forward Voltage



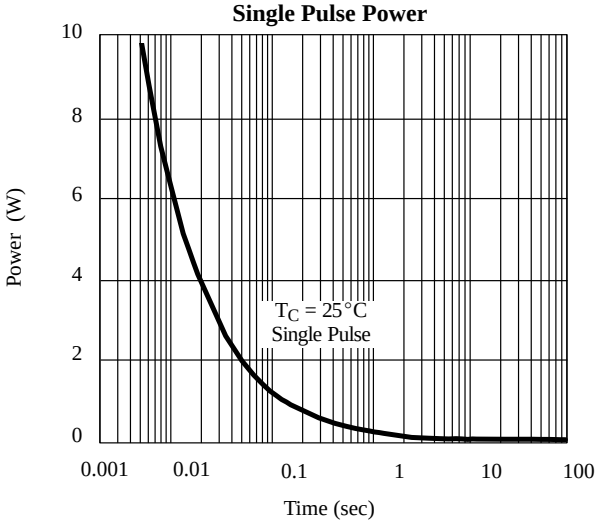
On-Resistance vs. Gate-to-Source Voltage



Threshold Voltage



Single Pulse Power



Normalized Thermal Transient Impedance, Junction-to-Ambient