



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

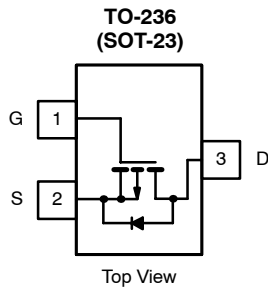
PRODUCT SUMMARY		
V <sub>DS</sub> (V)	r <sub>DS(on)</sub> (Ω)	I <sub>D</sub> (A)
-20	0.65 @ V <sub>GS</sub> = -4.5 V	-0.58
	0.85 @ V <sub>GS</sub> = -2.5 V	-0.5

### FEATURES

- TrenchFET® Power MOSFET
- ESD Protected: 3000 V

### APPLICATIONS

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



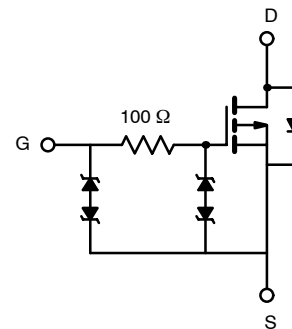
Marking Code: K4ywl

K4 = Part Number Code for TP0101K

y = Year Code

w = Week Code

l = Lot Traceability



Ordering Information: TP0101K-T1—E3 (Lead Free)

ABSOLUTE MAXIMUM RATINGS (T <sub>A</sub> = 25 °C UNLESS OTHERWISE NOTED)			
Parameter	Symbol	Limits	Unit
Drain-Source Voltage	V <sub>DS</sub>	-20	V
Gate-Source Voltage	V <sub>GS</sub>	±8	
Continuous Drain Current (T <sub>J</sub> = 150 °C) <sup>b</sup>	I <sub>D</sub>	T <sub>A</sub> = 25 °C	-0.58
		T <sub>A</sub> = 70 °C	-0.46
Pulsed Drain Current <sup>a</sup>	I <sub>DM</sub>	-2	A
Continuous Source Current (Diode Conduction) <sup>b</sup>	I <sub>S</sub>	-0.3	
Power Dissipation <sup>b</sup>	P <sub>D</sub>	T <sub>A</sub> = 25 °C	0.35
		T <sub>A</sub> = 70 °C	0.22
Operating Junction and Storage Temperature Range	T <sub>J</sub> , T <sub>stg</sub>	-55 to 150	°C

THERMAL RESISTANCE RATINGS			
Parameter	Symbol	Limits	Unit
Thermal Resistance, Junction-to-Ambient <sup>b</sup>	R <sub>thJA</sub>	357	°C/W

Notes

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



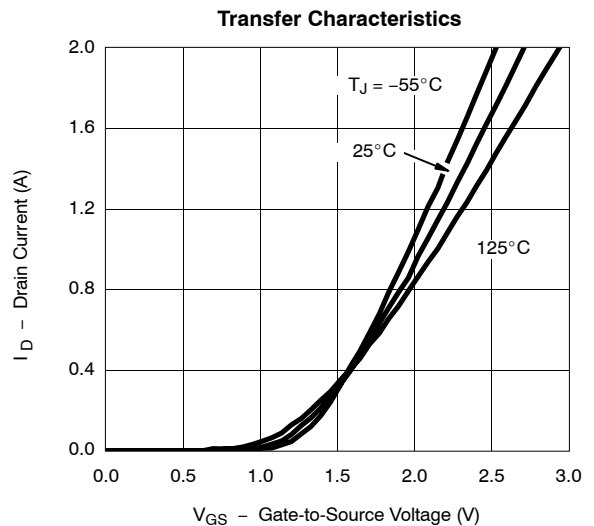
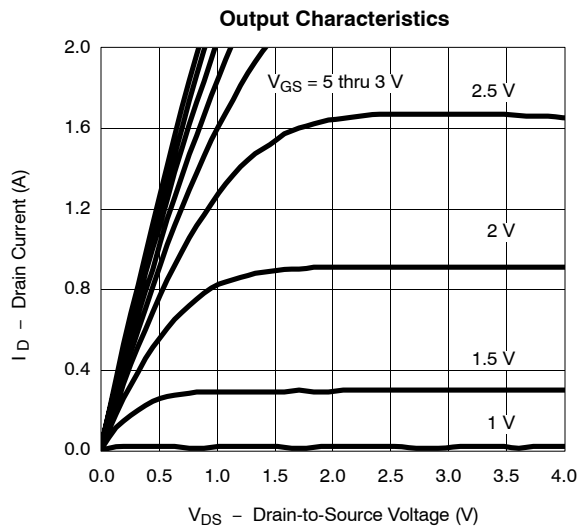
**SPECIFICATIONS (T<sub>A</sub> = 25 °C UNLESS OTHERWISE NOTED)**

Parameter	Symbol	Test Conditions	Limits			Unit
			Min	Typ	Max	
<b>Static</b>						
Drain-Source Breakdown Voltage	V <sub>(BR)DSS</sub>	V <sub>GS</sub> = 0 V, I <sub>D</sub> = -10 μA	-20			V
Gate-Threshold Voltage	V <sub>GS(th)</sub>	V <sub>DS</sub> = V <sub>GS</sub> , I <sub>D</sub> = -50 μA	-0.5	-0.7	-1.0	V
Gate-Body Leakage	I <sub>GSS</sub>	V <sub>DS</sub> = 0 V, V <sub>GS</sub> = ±4.5 V			±5	μA
Zero Gate Voltage Drain Current	I <sub>DSS</sub>	V <sub>DS</sub> = -20 V, V <sub>GS</sub> = 0 V T <sub>J</sub> = 55 °C			-1 -10	μA
On-State Drain Current <sup>a</sup>	I <sub>D(on)</sub>	V <sub>DS</sub> ≤ -5 V, V <sub>GS</sub> = -4.5 V	-1.2			A
		V <sub>DS</sub> ≤ -5 V, V <sub>GS</sub> = -2.5 V	-0.5			A
Drain-Source On-Resistance <sup>a</sup>	r <sub>DS(on)</sub>	V <sub>GS</sub> = -4.5 V, I <sub>D</sub> = -0.58 A		0.42	0.65	Ω
		V <sub>GS</sub> = -2.5 V, I <sub>D</sub> = -0.5 A		0.64	0.85	Ω
Forward Transconductance <sup>a</sup>	g <sub>fs</sub>	V <sub>DS</sub> = -5 V, I <sub>D</sub> = -0.58 A		1300		mS
Diode Forward Voltage <sup>a</sup>	V <sub>SD</sub>	I <sub>S</sub> = -0.3 A, V <sub>GS</sub> = 0 V		-0.9	-1.2	V
<b>Dynamic<sup>b</sup></b>						
Total Gate Charge	Q <sub>g</sub>	V <sub>DS</sub> = -6 V, V <sub>GS</sub> = -4.5 V I <sub>D</sub> ≅ -0.58 A		1400	2200	pC
Gate-Source Charge	Q <sub>gs</sub>			300		
Gate-Drain Charge	Q <sub>gd</sub>			250		
Gate Resistance	R <sub>g</sub>		150		Ω	
Turn-On Time	t <sub>d(on)</sub>	V <sub>DD</sub> = -6 V, R <sub>L</sub> = 10 Ω I <sub>D</sub> ≅ -0.58 A, V <sub>GEN</sub> = -4.5 V R <sub>g</sub> = 6 Ω		25	35	ns
	t <sub>r</sub>			30	45	
Turn-Off Time	t <sub>d(off)</sub>			55	85	
	t <sub>f</sub>			38	60	

Notes

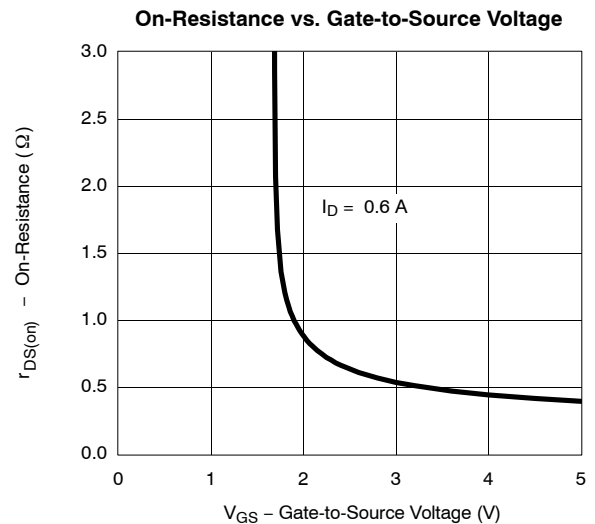
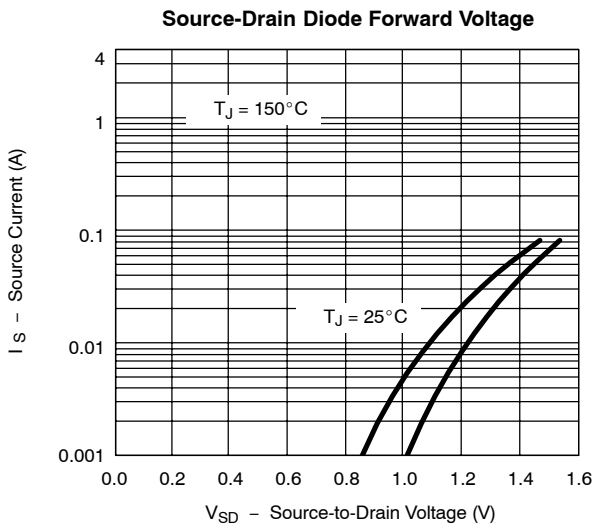
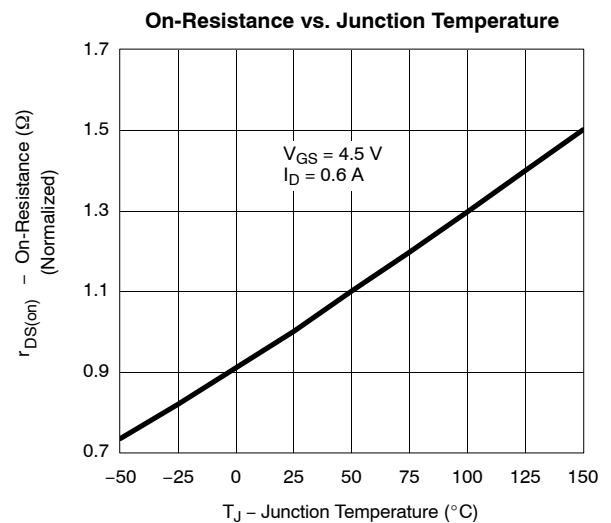
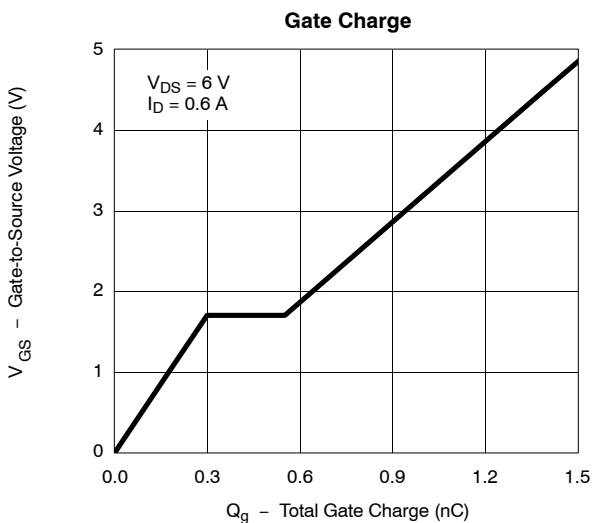
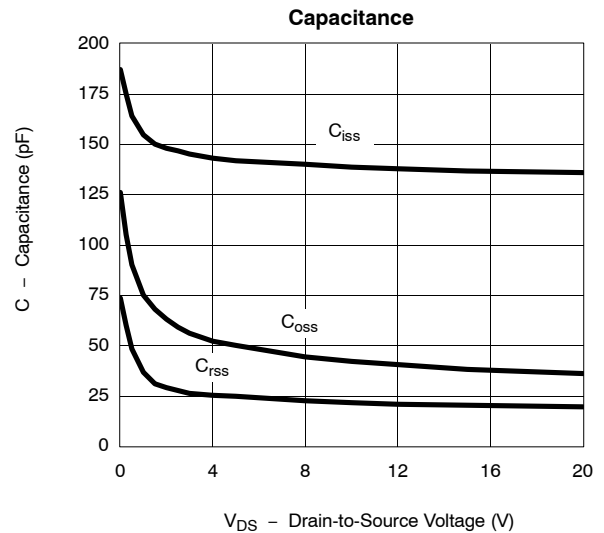
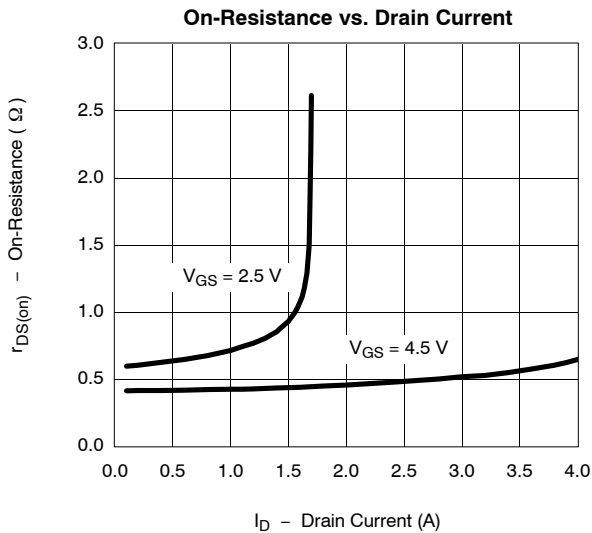
- a. Pulse test: PW ≤ 300 μs duty cycle ≤ 2%.
- b. Guaranteed by design, not subject to production testing

**TYPICAL CHARACTERISTICS (25 °C UNLESS NOTED)**



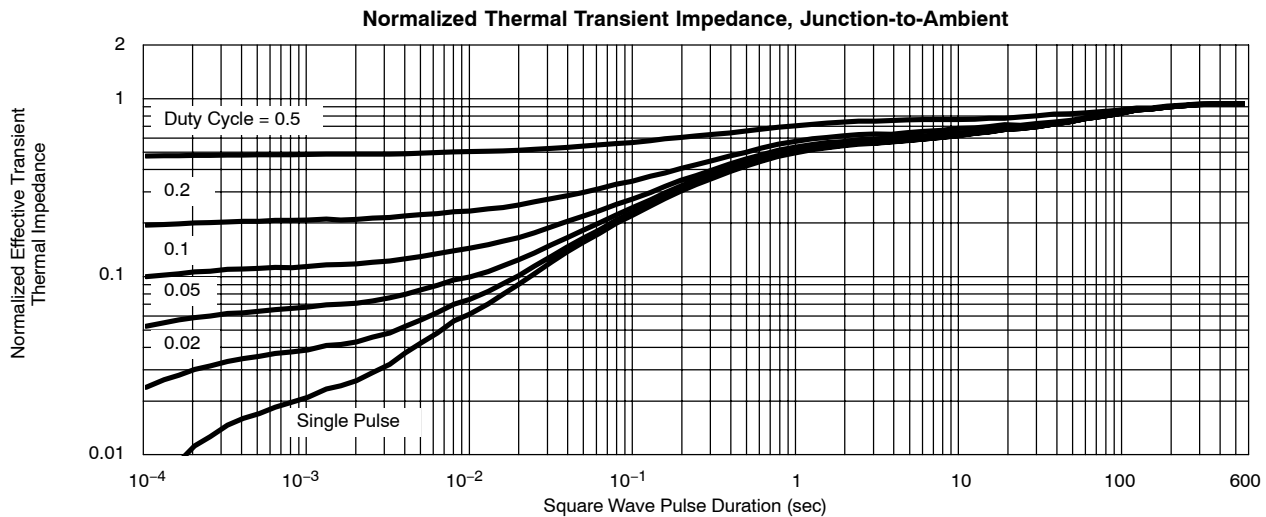
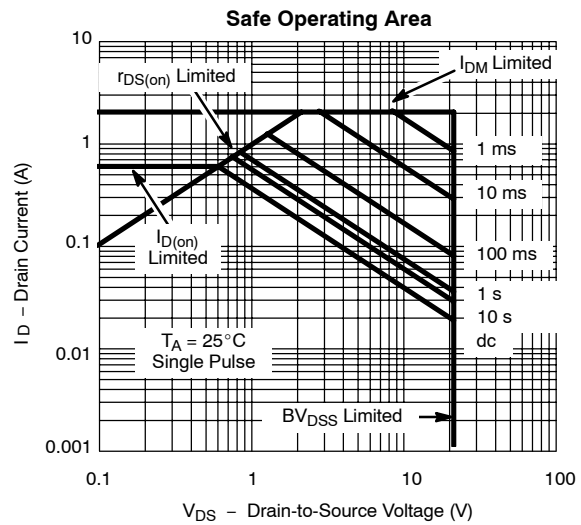
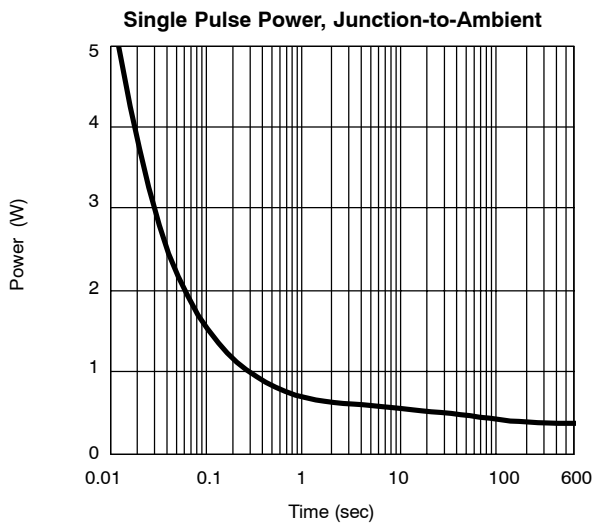
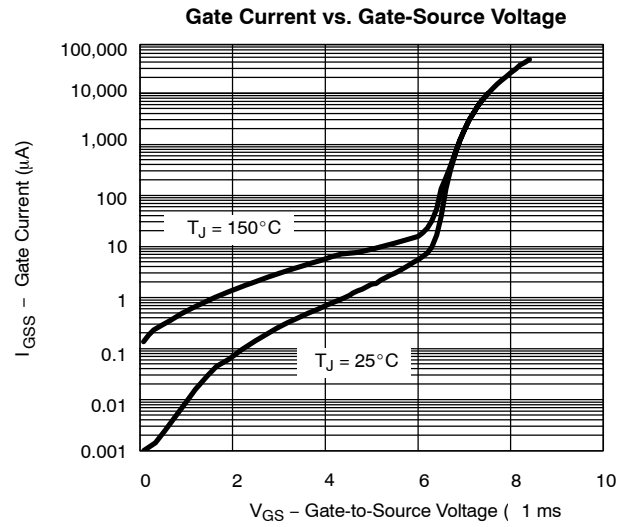
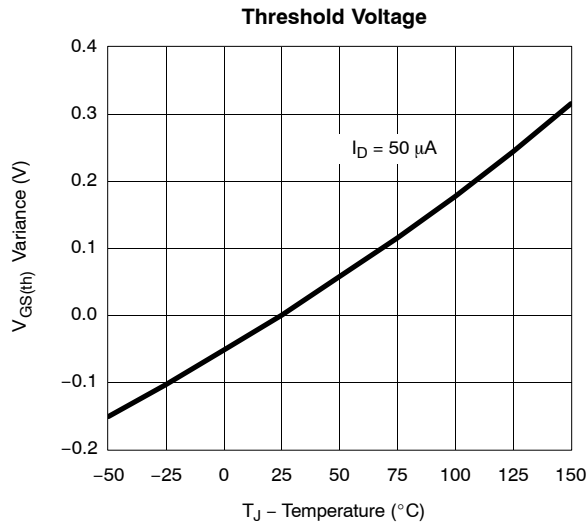


**TYPICAL CHARACTERISTICS (25°C UNLESS NOTED)**





#### TYPICAL CHARACTERISTICS (25°C UNLESS NOTED)





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