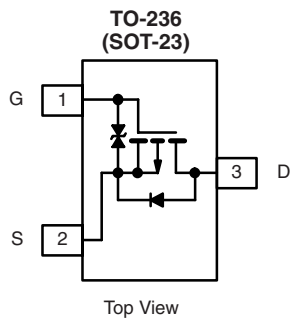


P-Channel 30-V (D-S) MOSFET

PRODUCT SUMMARY

V_{DS} (V)	$R_{DS(on)}$ (Ω)	$V_{GS(th)}$ (V)	I_D (mA)	Q_g (Typ.)
- 30	1.4 at $V_{GS} = - 10$ V	- 1.3 to - 3.0	- 385	1000
	3.5 at $V_{GS} = - 4.5$ V	- 1.3 to - 3.0	- 240	



Marking Code: 2Kw//

2K = Part Number Code for TP0202K
w = Week Code
// = Lot Traceability

Ordering Information: TP0202K-T1-E3 (Lead (Pb)-free)
TP0202K-T1-GE3 (Lead (Pb)-free and Halogen-free)

FEATURES

- Halogen-free According to IEC 61249-2-21 Available
- TrenchFET® Power MOSFET
- High-Side Switching
- Low On-Resistance: 1.2 Ω (typ.)
- Low Threshold: - 2 V (typ.)
- Fast Switching Speed: 14 ns (typ.)
- Low Input Capacitance: 31 pF (typ.)
- 2000 V ESD Protection



RoHS
COMPLIANT
HALOGEN
FREE
Available

APPLICATIONS

- Drivers: Relays, Solenoids, Lamps, Hammers, Display, Memories, Transistors, etc.
- Battery Operated Systems
- Power Supply Converter Circuits
- Solid-State Relays

BENEFITS

- Ease in Driving Switches
- Low Offset (Error) Voltage
- Low-Voltage Operation
- High-Speed Circuits
- Easily Driven without Buffer

ABSOLUTE MAXIMUM RATINGS $T_A = 25$ °C, unless otherwise noted

Parameter	Symbol	Limit	Unit
Drain-Source Voltage	V_{DS}	- 30	V
Gate-Source Voltage	V_{GS}	± 20	
Continuous Drain Current ($T_J = 150$ °C) ^a	I_D	- 385	mA
		- 280	
Pulsed Drain Current ^b	I_{DM}	- 750	
Power Dissipation ^a	P_D	350	mW
		185	
Maximum Junction-to-Ambient ^a	R_{thJA}	350	°C/W
Operating Junction and Storage Temperature Range	T_J, T_{stg}	- 55 to 150	°C

Notes:

a. Surface Mounted on FR4 board.

b. Pulse width limited by maximum junction temperature.

SPECIFICATIONS T _A = 25 °C, unless otherwise noted						
Parameter	Symbol	Test Conditions	Limits			Unit
			Min.	Typ.	Max.	
Static						
Drain-Source Breakdown Voltage	V _{DS}	V _{GS} = 0 V, I _D = - 100 μA	- 30	- 38		V
Gate-Threshold Voltage	V _{GS(th)}	V _{DS} = V _{GS} , I _D = - 250 μA	- 1.3	- 2	- 3.0	
Gate-Body Leakage	I _{GSS}	V _{DS} = 0 V, V _{GS} = ± 5 V			± 50	nA
		V _{DS} = 0 V, V _{GS} = ± 10 V			± 300	
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} = - 30 V, V _{GS} = 0 V			- 100	μA
		V _{DS} = - 30 V, V _{GS} = 0 V, T _J = 85 °C			- 10	
On-State Drain Current ^a	I _{D(on)}	V _{GS} = - 10 V, V _{DS} = - 10 V	- 500			mA
Drain-Source On-Resistance ^a	R _{DS(on)}	V _{GS} = - 4.5 V, I _D = - 50 mA		2.1	3.5	Ω
		V _{GS} = - 10 V, I _D = - 500 mA		1.25	1.4	
Forward Transconductance ^a	g _{fs}	V _{DS} = - 5 V, I _D = - 200 mA		315		mS
Diode Forward Voltage ^a	V _{SD}	I _S = - 250 mA, V _{GS} = 0 V			- 1.2	V
Dynamic						
Total Gate Charge	Q _g	V _{DS} = - 16 V, V _{GS} = - 10 V I _D ≅ - 200 mA		1000		pC
Gate-Source Charge	Q _{gs}			225		
Gate-Drain Charge	Q _{gd}			175		
Input Capacitance	C _{iss}	V _{DS} = - 15 V, V _{GS} = 0 V f = 1 MHz		31		pF
Output Capacitance	C _{oss}			11		
Reverse Transfer Capacitance	C _{rss}			4		
Switching ^b						
Turn-On Time	t _{d(on)}	V _{DD} = - 15 V, R _L = 75 Ω I _D ≅ - 200 mA, V _{GEN} = - 10 V, R _G = 6 Ω		9		ns
	t _r			6		
Turn-Off Time	t _{d(off)}			30		
	t _f			20		

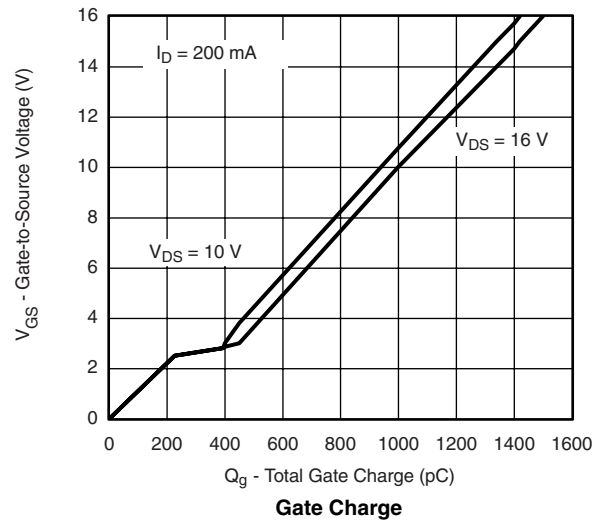
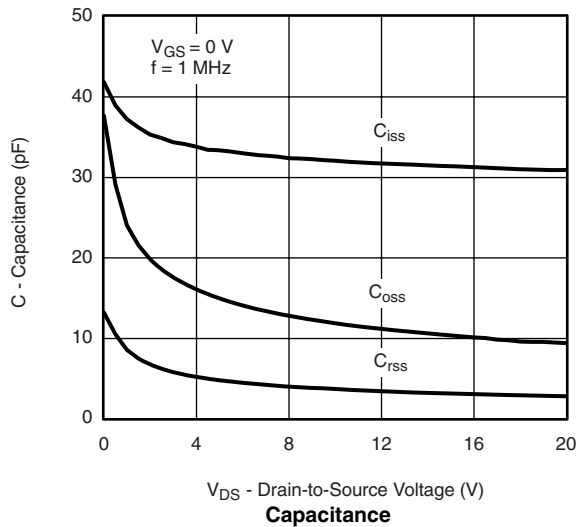
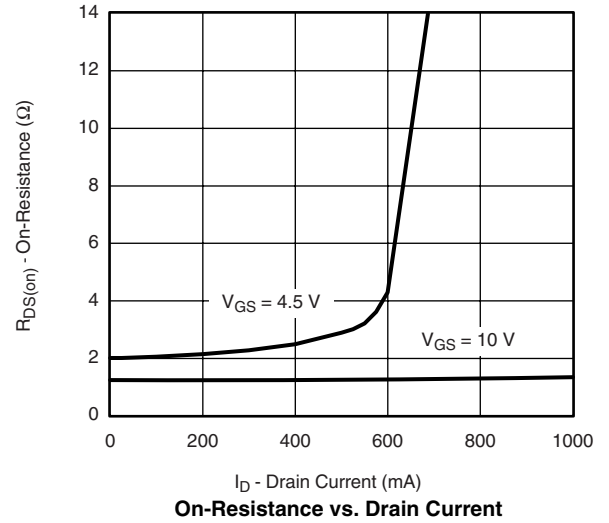
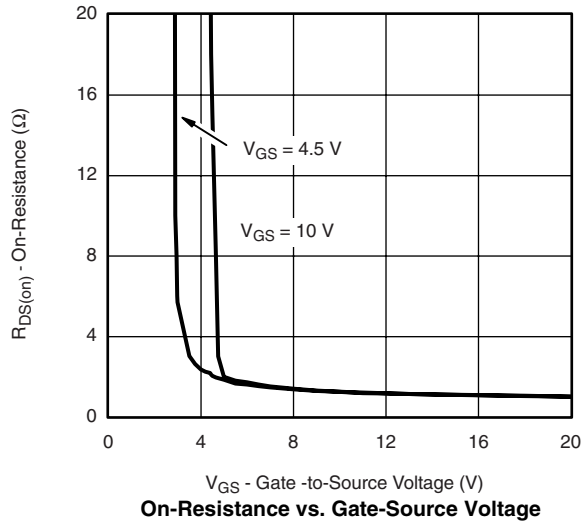
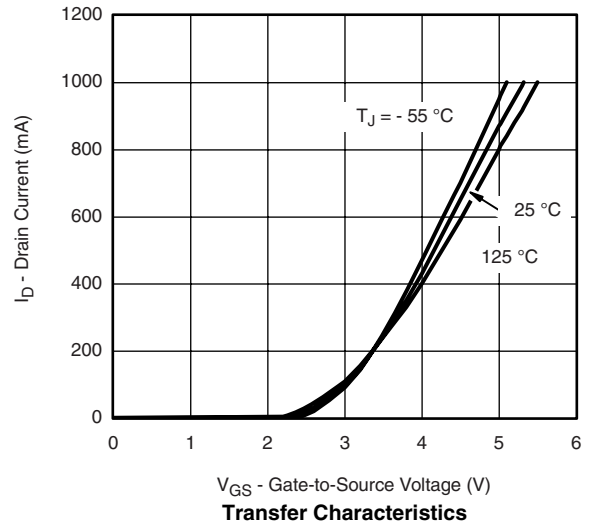
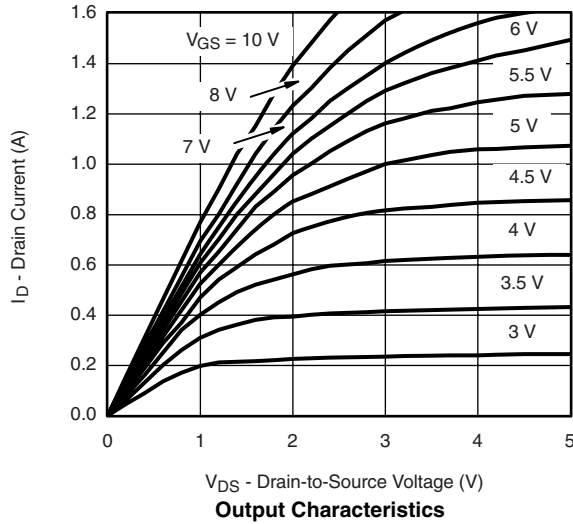
Notes:

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

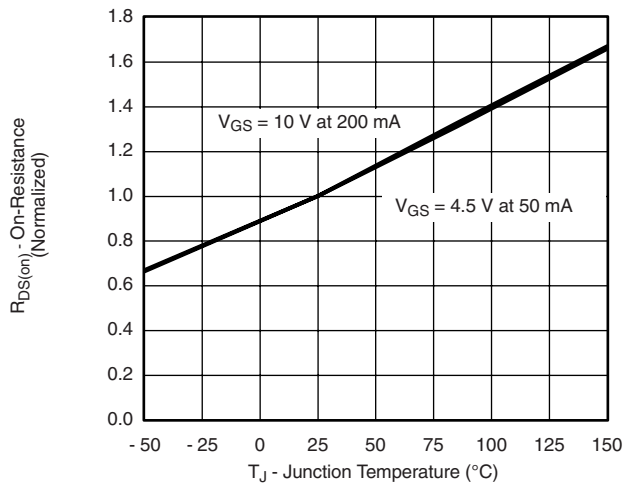
b. Switching time is essentially independent of operating temperature.

Stresses beyond those listed under "Absolute Maximum Ratings" may cause permanent damage to the device. These are stress ratings only, and functional operation of the device at these or any other conditions beyond those indicated in the operational sections of the specifications is not implied. Exposure to absolute maximum rating conditions for extended periods may affect device reliability.

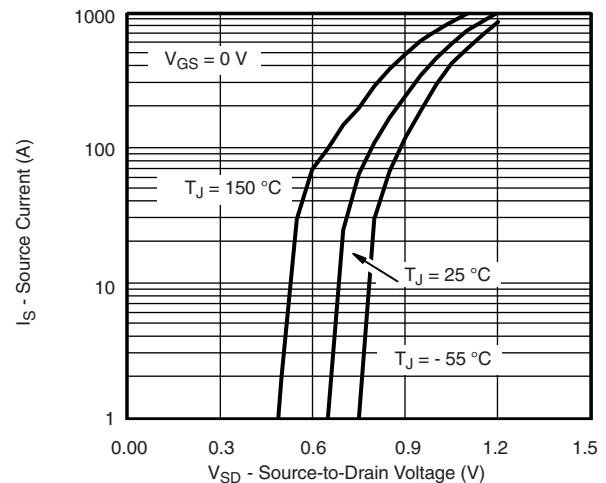
TYPICAL CHARACTERISTICS 25 °C, unless otherwise noted



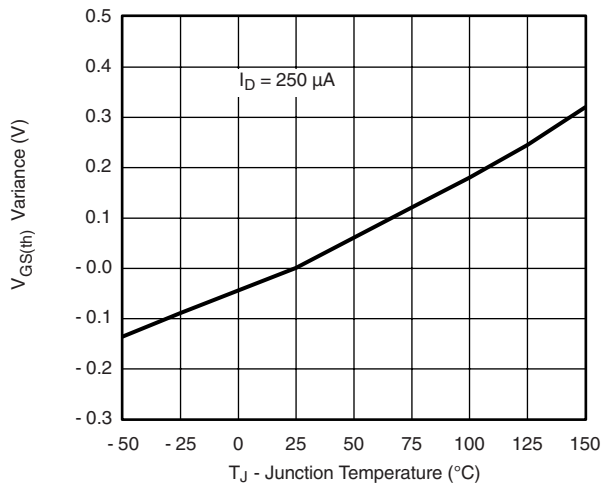
TYPICAL CHARACTERISTICS 25 °C, unless otherwise noted



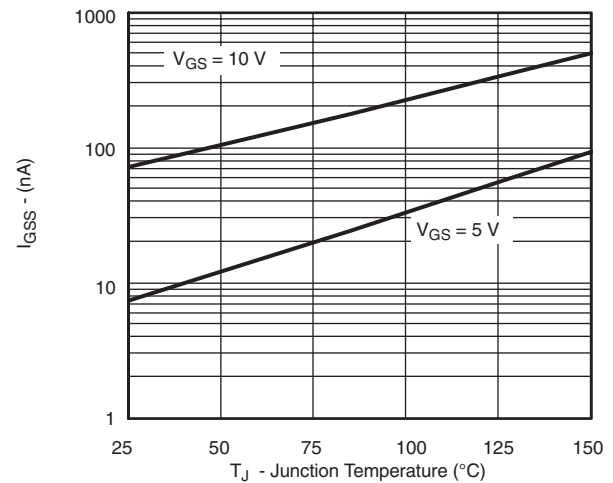
On-Resistance vs. Junction Temperature



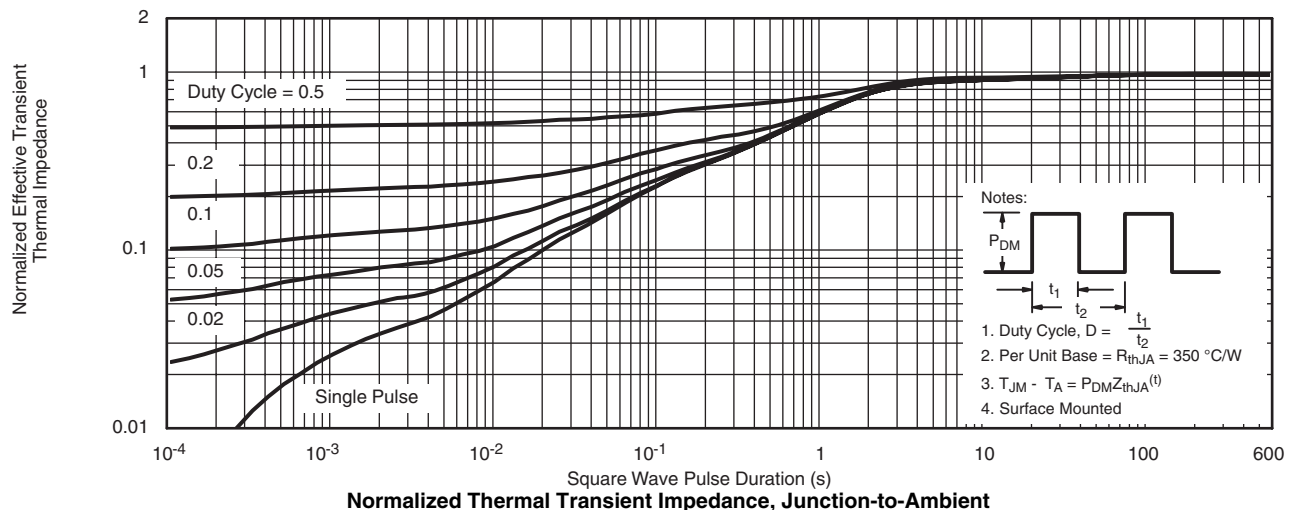
Source-Drain Diode Forward Voltage



Threshold Voltage Variance Over Temperature



I_{GSS} vs. Temperature



Normalized Thermal Transient Impedance, Junction-to-Ambient

Vishay Siliconix maintains worldwide manufacturing capability. Products may be manufactured at one of several qualified locations. Reliability data for Silicon Technology and Package Reliability represent a composite of all qualified locations. For related documents such as package/tape drawings, part marking, and reliability data, see www.vishay.com/ppg?71609.



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