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

PRODUCT SUMMARY		
V_{DS} (V)	$r_{DS(on)}$ (Ω)	I_D (mA)
–20	3.8 @ V_{GS} = –4.5 V	–180
	5.0 @ V_{GS} = –2.5 V	–100

FEATURES

- High-Side Switching
- Low On-Resistance: 2.6 Ω (typ)
- Low Threshold: 0.9 V (typ)
- Fast Switching Speed: 35 ns
- 2.5 V or Lower Operation

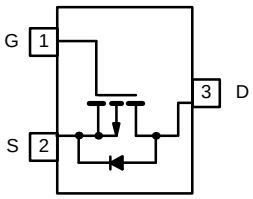
BENEFITS

- Ease in Driving Switches
- Low Offset (Error) Voltage
- Low-Voltage Operation
- High-Speed Circuits
- Low Battery Voltage Operation

APPLICATIONS

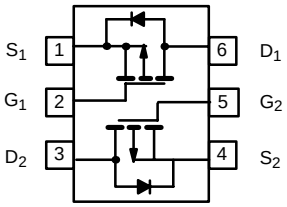
- Drivers: Relays, Solenoids, Lamps, Hammers, Display, Memories
- Battery Operated Systems
- Load/Power Switching-Cell Phones, PDA

SOT-323
SC-70 (3-Leads)



Order Number:
TP0205A

SOT-363
SC-70 (6-Leads)



Order Number:
TP0205AD

Marking Code:

TP0205A: A*l*
TP0205AD: C*wl*

w = Week Code
l = Lot Traceability

ABSOLUTE MAXIMUM RATINGS (T_A = 25°C UNLESS OTHERWISE NOTED)					
Parameter		**Symbol**	**TP0205A**	**TP0205AD**	**Unit**
Drain-Source Voltage		V_{DS}	–20		V
Gate-Source Voltage		V_{GS}	±8		
Continuous Drain Current (T_J = 150°C)[a]	T_A = 25°C	I_D	–180		mA
	T_A = 70°C		–140		
Pulsed Drain Current		I_{DM}	–500		
Maximum Power Dissipation[a]	T_A = 25°C	P_D	0.15	0.20 (Total)	W
	T_A = 70°C		0.10	0.13 (Total)	
Operating Junction and Storage Temperature Range		T_J, T_{stg}	–55 to 150		°C

THERMAL RESISTANCE RATINGS				
Parameter	**Symbol**	**TP0205A**	**TP0205AD**	**Unit**
Thermal resistance, Junction-to-Ambient[a]	R_{thJA}	833	625 (Total)	°C/W

Notes
a. Surface Mounted on FR4 Board, t ≤ 10 sec.

SPECIFICATIONS (T_A = 25°C UNLESS OTHERWISE NOTED)

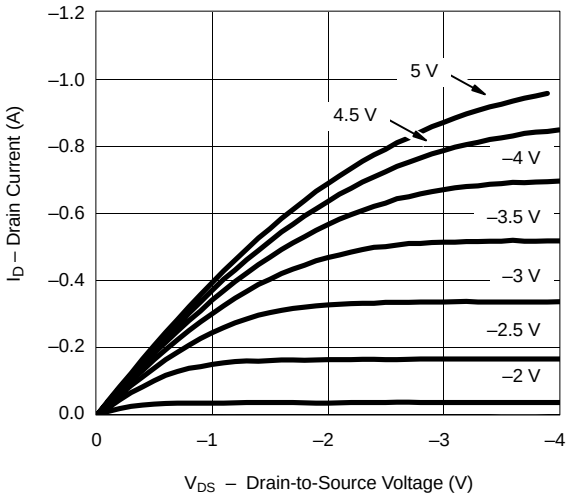
Parameter	Symbol	Test Condition	Min	Typ[b]	Max	Unit
Static						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	V_{DS} = 0 V, I_D = –10 μA	–20	–24		V
Gate-Threshold Voltage	$V_{GS(th)}$	V_{DS} = V_{GS}, I_D = –50 μA	–0.4	–0.9	–1.5	
Gate-Body Leakage	I_{GSS}	V_{DS} = 0 V, V_{GS} = ±8 V		±2	±100	nA
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS} = –20 V, V_{GS} = 0 V		–0.001	–100	
		V_{DS} = –20 V, V_{GS} = 0 V, T_J = 55°C			–1	μA
On-State Drain Current[a]	$I_{D(on)}$	V_{GS} = –4.5 V, V_{DS} = –8.0 V	–400			mA
		V_{GS} = –2.5 V, V_{DS} = –5.0 V	–120			
Drain-Source On-State Resistance[a]	$r_{DS(on)}$	V_{GS} = –4.5 V, I_D = –180 mA		2.6	3.8	Ω
		V_{GS} = –2.5 V, I_D = –75 mA		4.0	5.0	
Forward Transconductance[a]	g_{fs}	V_{DS} = –2.5 V, I_D = –50 mA		200		mS
Diode Forward Voltage[a]	V_{SD}	I_S = –50 mA, V_{GS} = 0 V		–0.7	–1.2	V
Dynamic						
Total Gate Charge	Q_g	V_{DS} = –5.0 V, V_{GS} = –4.5 V, I_D = –100 mA		350	450	pC
Gate-Source Charge	Q_{gs}			25		
Gate-Drain Charge	Q_{gd}			125		
Input Capacitance	C_{iss}	V_{DS} = –5.0 V, V_{GS} = 0 V, f = 1 MHz		20		pF
Output Capacitance	C_{oss}			14		
Reverse Transfer Capacitance	C_{rss}			5		
Switching [c]						
Turn-On Delay Time	$t_{d(on)}$	V_{DD} = –3.0 V, R_L = 100 Ω I_D = –0.25 A, V_{GEN} = –4.5 V, R_G = 10 Ω		7	12	ns
Rise Time	t_r			25	35	
Turn-Off Delay Time	$t_{d(off)}$			19	30	
Fall Time	t_f			9	15	

Notes
a. Pulse test; pulse width ≤ 300 μs, duty cycle ≤ 2%.
b. For design only, not subject to production testing.
c. Switching time is essentially independent of operating temperature.

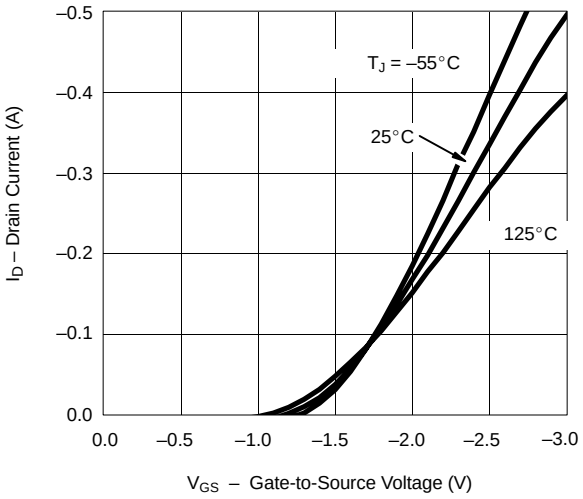
VPOJ

TYPICAL CHARACTERISTICS (T_A = 25°C UNLESS OTHERWISE NOTED)

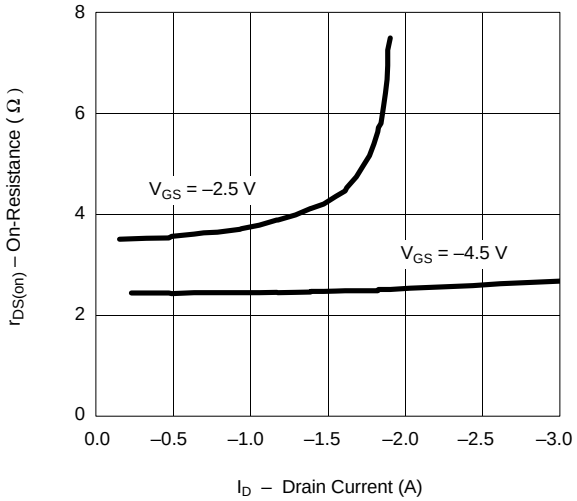
Output Characteristics



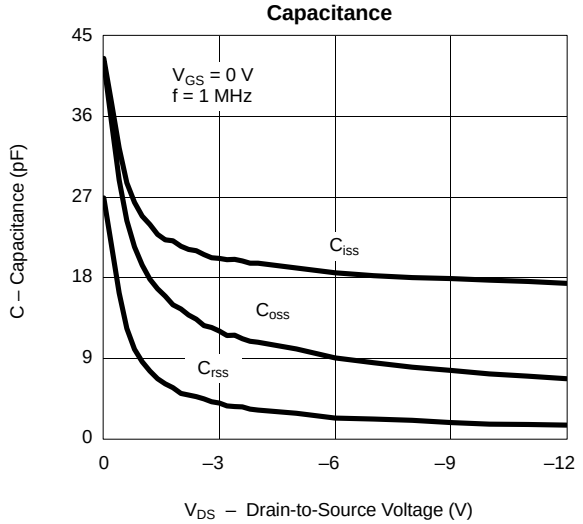
Transfer Characteristics



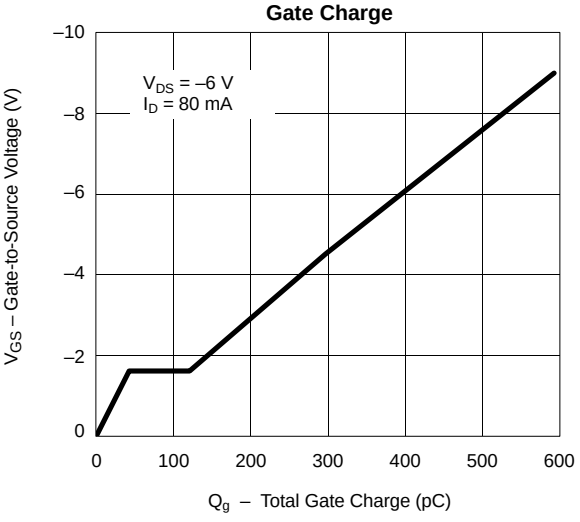
On-Resistance vs. Drain Current



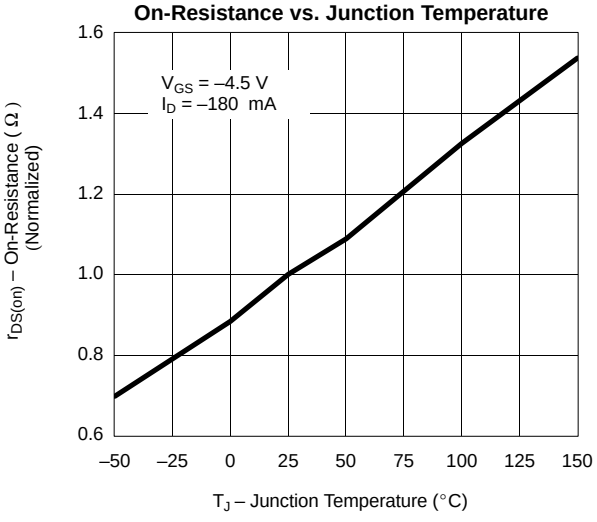
Capacitance



Gate Charge

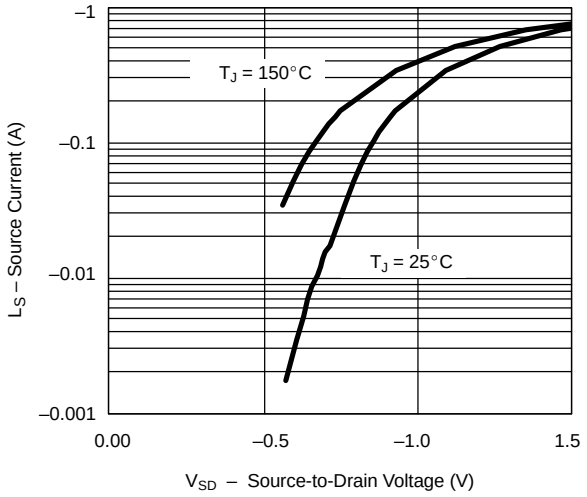


On-Resistance vs. Junction Temperature

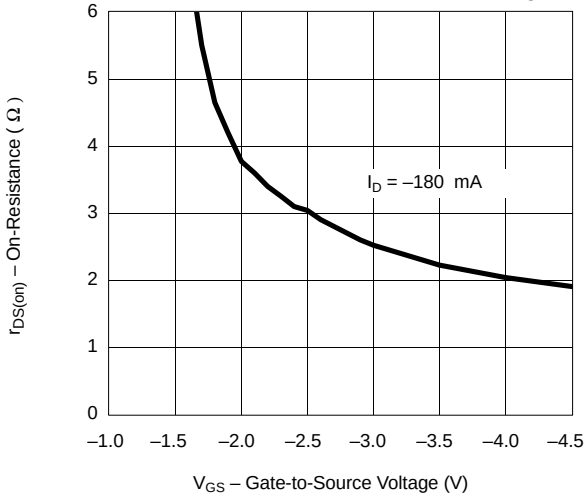


TYPICAL CHARACTERISTICS (T_A = 25°C UNLESS OTHERWISE NOTED)

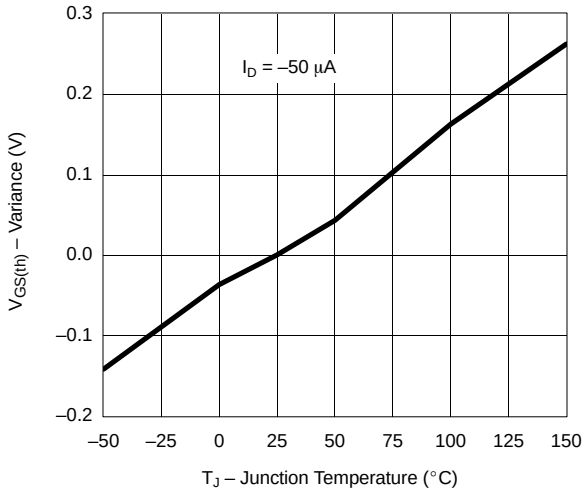
Source-Drain Diode Forward Voltage



On-Resistance vs. Gate-to-Source Voltage



Threshold Voltage



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.