



New Product

TP0205A/AD
Vishay Siliconix

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

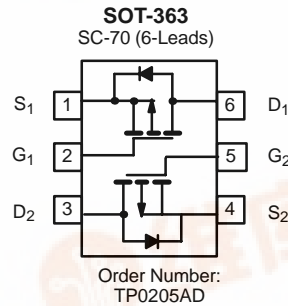
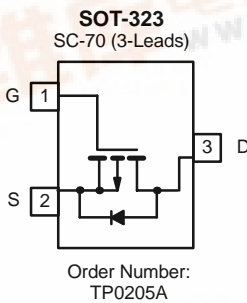
- High-Side Switching
- Low On-Resistance: 2.6 Ω (typ)
- Low Threshold: 0.9 V (typ)
- Fast Switching Speed: 35 ns
- 2.5 V or Lower Operation

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



Marking Code:
TP0205A: A/
TP0205AD: Cw/
w = Week Code
/ = Lot Traceability

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

THERMAL RESISTANCE RATINGS				
Parameter	Symbol	TP0205A	TP0205AD	Unit
Thermal resistance, Junction-to-Ambient ^a	R_{thJA}	833	625 (Total)	$^\circ\text{C/W}$

Notes:
a. Surface Mounted on FR4 Board, $t \leq 10$ sec.

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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	
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

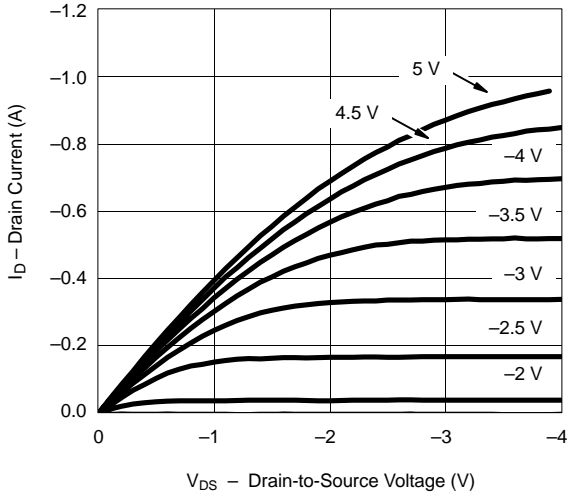


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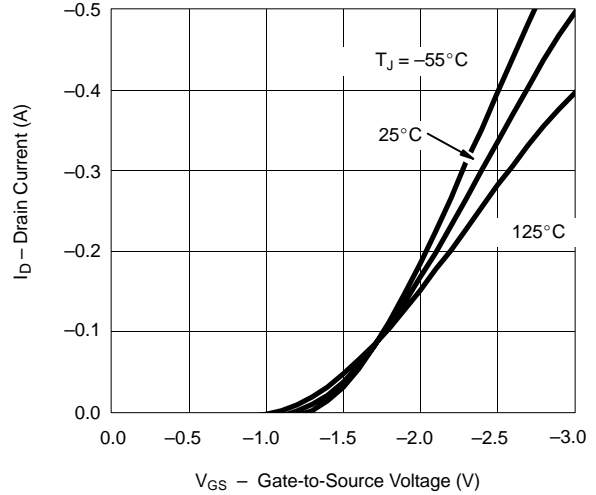
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TYPICAL CHARACTERISTICS ($T_A = 25^\circ\text{C}$ UNLESS OTHERWISE NOTED)

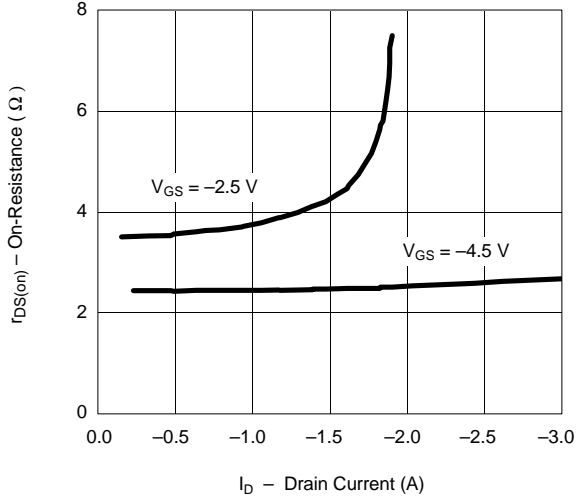
Output Characteristics



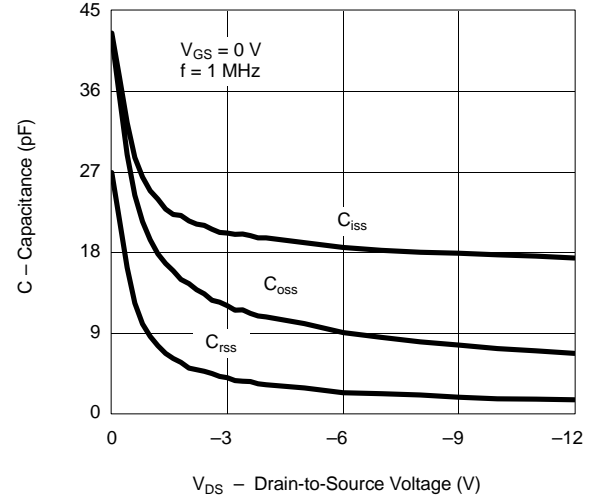
Transfer Characteristics



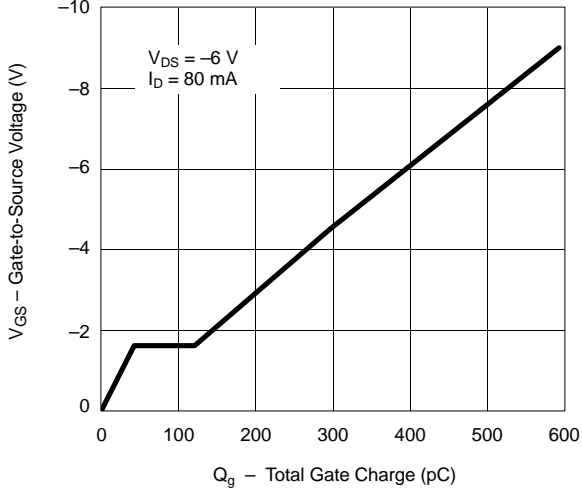
On-Resistance vs. Drain Current



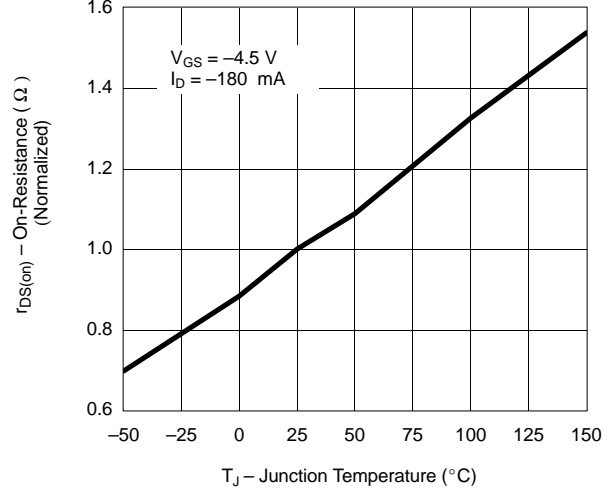
Capacitance



Gate Charge



On-Resistance vs. Junction Temperature





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