

Complementary Trench MOSFET

AO6602

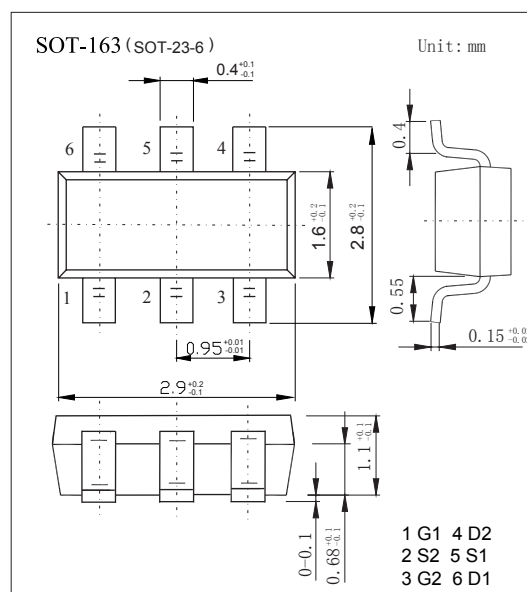
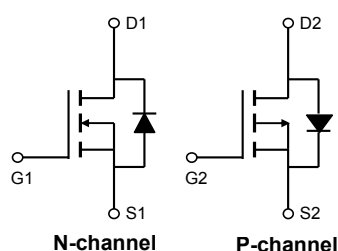
■ Features

N-Channel

- $V_{DS} (V) = 30V$
- $I_D = 3.5 A$ ($V_{GS} = 10V$)
- $R_{DS(ON)} < 50m\Omega$ ($V_{GS} = 10V$)
- $R_{DS(ON)} < 70m\Omega$ ($V_{GS} = 4.5V$)

P-Channel

- $V_{DS} (V) = -30V$
- $I_D = -2.7 A$ ($V_{GS} = -10V$)
- $R_{DS(ON)} < 100m\Omega$ ($V_{GS} = -10V$)
- $R_{DS(ON)} < 170m\Omega$ ($V_{GS} = -4.5V$)



■ Absolute Maximum Ratings $T_a = 25^\circ C$

Parameter		Symbol	N-Channel	P-Channel	Unit
Drain-Source Voltage		V _{DS}	30	-30	V
Gate-Source Voltage		V _{GS}	±20		
Continuous Drain Current	TA=25℃	I _D	3.5	-2.7	A
	TA=70℃		3	-2.1	
Pulsed Drain Current		I _{DM}	20	-15	
Power Dissipation	TA=25℃	P _D	1.15		W
	TA=70℃		0.73		
Thermal Resistance.Junction- to-Ambient	t ≤ 10s	R _{thJA}	110		℃/W
	Steady-State		150		
Thermal Resistance.Junction- to-Lead		R _{thJL}	80		
Junction Temperature		T _J	150		℃
Storage Temperature Range		T _{stg}	-55 to 150		

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■ N-Channel Electrical Characteristics Ta = 25°C

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Drain-Source Breakdown Voltage	V _{DSS}	I _D =250 μA, V _{GS} =0V	30			V
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} =30V, V _{GS} =0V			1	μA
		V _{DS} =30V, V _{GS} =0V, T _J =55°C			5	
Gate-Body Leakage Current	I _{GSS}	V _{DS} =0V, V _{GS} =±20V			±100	nA
Gate Threshold Voltage	V _{GS(th)}	V _{DS} =V _{GS} , I _D =250 μA	1.5		2.5	V
Static Drain-Source On-Resistance	R _{DS(on)}	V _{GS} =10V, I _D =3.5A			50	mΩ
		V _{GS} =10V, I _D =3.5A, T _J =125°C			77	
		V _{GS} =4.5V, I _D =2A			70	
On State Drain Current	I _{D(ON)}	V _{GS} =10V, V _{DS} =5V	20			A
Forward Transconductance	g _{FS}	V _{DS} =5V, I _D =3.5A		12		S
Input Capacitance	C _{iss}	V _{GS} =0V, V _{DS} =15V, f=1MHz		170	210	pF
Output Capacitance	C _{oss}			35		
Reverse Transfer Capacitance	C _{rss}			23		
Gate Resistance	R _g	V _{GS} =0V, V _{DS} =0V, f=1MHz	1.7		5.3	Ω
Total Gate Charge (10V)	Q _g	V _{GS} =10V, V _{DS} =15V, I _D =3.5A		4.05	5	nC
Total Gate Charge (4.5V)				2	3	
Gate Source Charge	Q _{gs}			0.55		
Gate Drain Charge	Q _{gd}			1		
Turn-On DelayTime	t _{d(on)}	V _{GS} =10V, V _{DS} =15V, R _L =4.2 Ω, R _G =3 Ω		4.5		ns
Turn-On Rise Time	t _r			1.5		
Turn-Off DelayTime	t _{d(off)}			18.5		
Turn-Off Fall Time	t _f			15.5		
Body Diode Reverse Recovery Time	t _{rr}	I _F = 3.5A, di/dt= 100A/us		7.5	10	nC
Body Diode Reverse Recovery Charge	Q _{rr}			2.5		
Maximum Body-Diode Continuous Current	I _S				1.5	A
Diode Forward Voltage	V _{SD}	I _S =1A, V _{GS} =0V			1	V

* The static characteristics in Figures 1 to 6 are obtained using <300us pulses, duty cycle 0.5% max.

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■ P-Channel Electrical Characteristics Ta = 25°C

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Drain-Source Breakdown Voltage	V _{DSS}	I _D =-250 μA, V _{GS} =0V	-30			V
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} =-30V, V _{GS} =0V			-1	μA
		V _{DS} =-30V, V _{GS} =0V, T _J =55°C			-5	
Gate-Body leakage current	I _{GSS}	V _{DS} =0V, V _{GS} =±20V			±100	nA
Gate Threshold Voltage	V _{GS(th)}	V _{DS} =V _{GS} , I _D =-250 μA	-1.4		-2.4	V
Static Drain-Source On-Resistance	R _{DS(on)}	V _{GS} =-10V, I _D =-2.7A			100	mΩ
		V _{GS} =-10V, I _D =-2.7A, T _J =125°C			140	
		V _{GS} =-4.5V, I _D =-2A			170	
On state drain current	I _{D(ON)}	V _{GS} =-10V, V _{DS} =-5V	-15			A
Forward Transconductance	g _{FS}	V _{DS} =-5V, I _D =-2.7A		5.5		S
Input Capacitance	C _{iss}	V _{GS} =0V, V _{DS} =-15V, f=1MHz		197	240	pF
Output Capacitance	C _{oss}			42		
Reverse Transfer Capacitance	C _{rss}			26	37	
Gate resistance	R _g	V _{GS} =0V, V _{DS} =0V, f=1MHz	3.5		11	Ω
Total Gate Charge (10V)	Q _g	V _{GS} =-10V, V _{DS} =-15V, I _D =-2.7A		4.3	5.2	nC
Total Gate Charge (4.5V)				2.2	3	
Gate Source Charge	Q _{gs}			0.7	1.2	
Gate Drain Charge	Q _{gd}			1.1		
Turn-On DelayTime	t _{d(on)}			7.5		
Turn-On Rise Time	t _r	V _{GS} =-10V, V _{DS} =-15V, R _L =5.55Ω, R _{GEN} =3Ω		4.1		ns
Turn-Off DelayTime	t _{d(off)}			11.8		
Turn-Off Fall Time	t _f			3.8		
Body Diode Reverse Recovery Time	t _{rr}	I _F =-2.7A, dI/dt=100A/μs		11.3	14	nC
Body Diode Reverse Recovery Charge	Q _{rr}			4.4		
Maximum Body-Diode Continuous Current	I _S				-1.5	A
Diode Forward Voltage	V _{SD}	I _S =-1A, V _{GS} =0V			-1	V

* The static characteristics in Figures 1 to 6 are obtained using <300us pulses, duty cycle 0.5% max.

■ Marking

Marking	F2**
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■ N-Channel Typical Characteristics

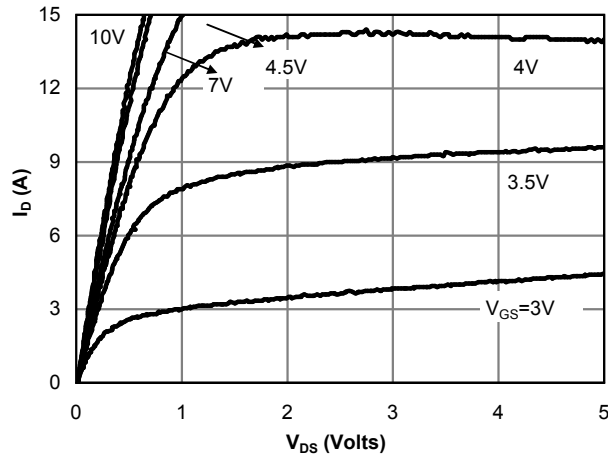


Fig 1: On-Region Characteristics (Note E)

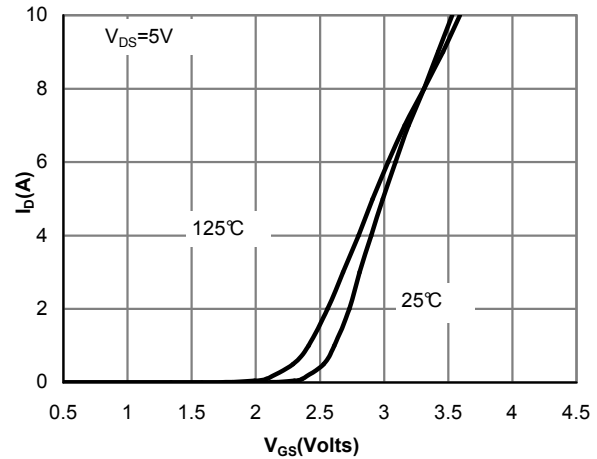


Figure 2: Transfer Characteristics (Note E)

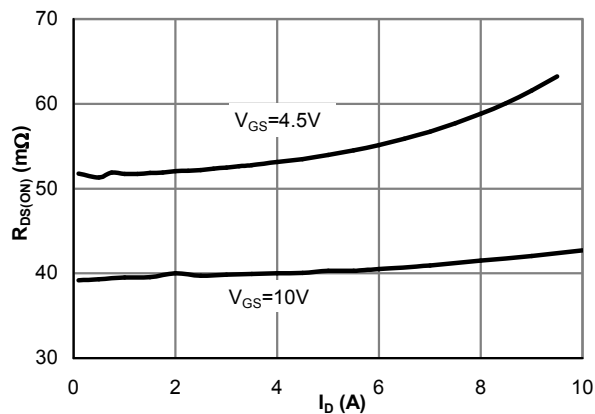


Figure 3: On-Resistance vs. Drain Current and Gate Voltage (Note E)

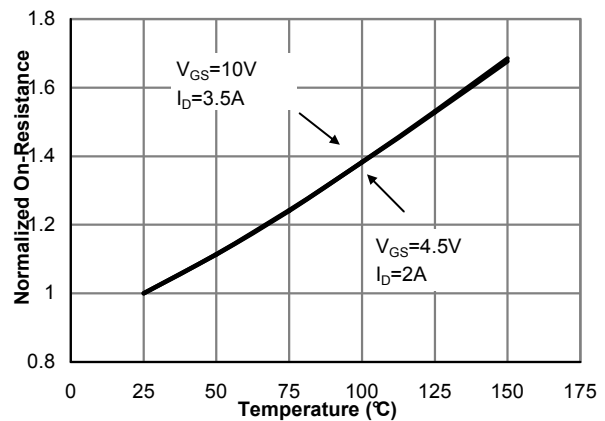


Figure 4: On-Resistance vs. Junction Temperature (Note E)

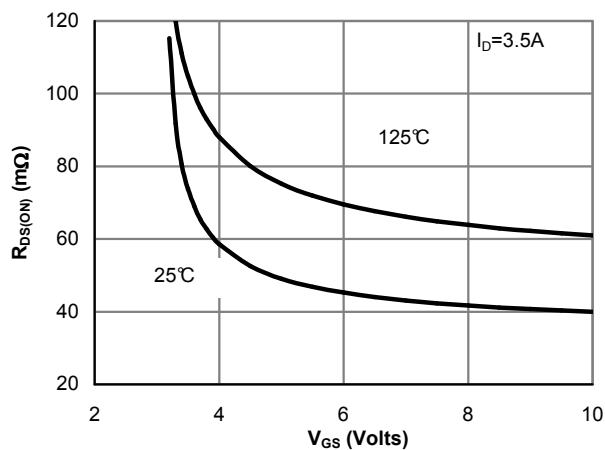


Figure 5: On-Resistance vs. Gate-Source Voltage (Note E)

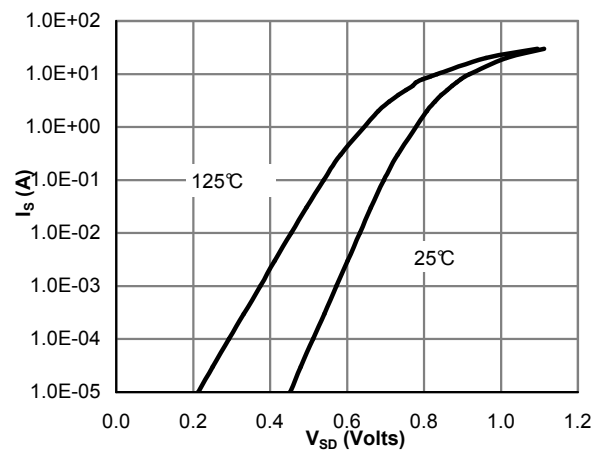


Figure 6: Body-Diode Characteristics (Note E)

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■ N-Channel Typical Characteristics

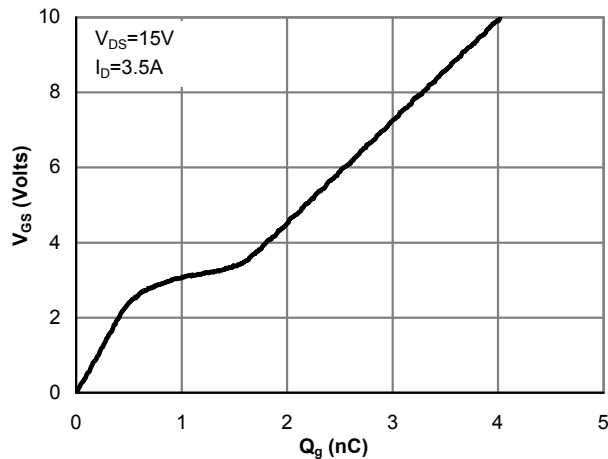


Figure 7: Gate-Charge Characteristics

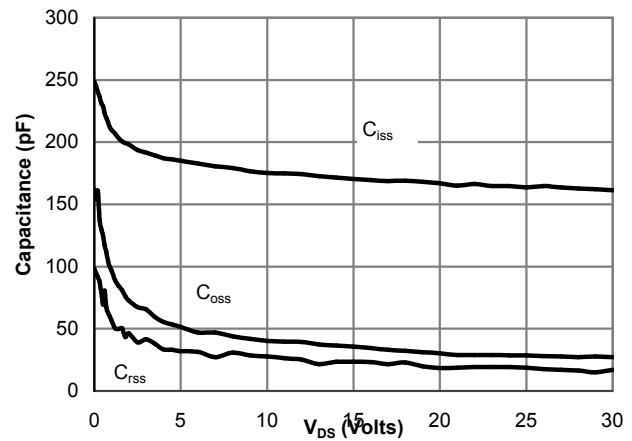


Figure 8: Capacitance Characteristics

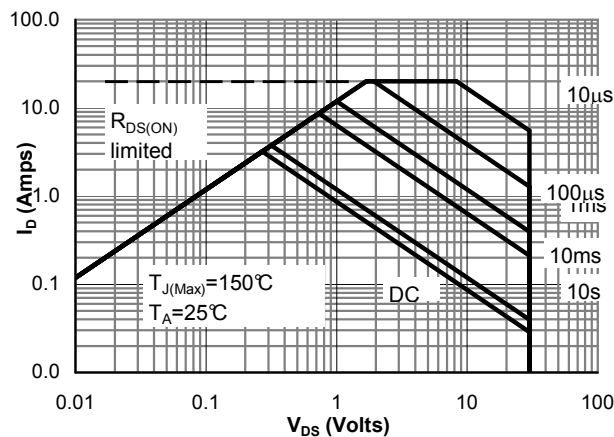


Figure 9: Maximum Forward Biased Safe Operating Area (Note F)

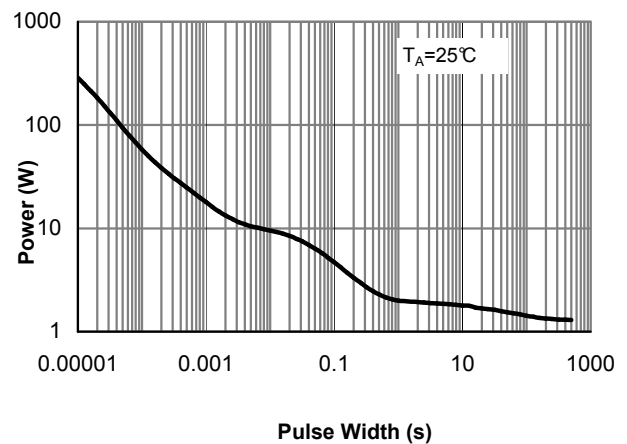


Figure 10: Single Pulse Power Rating Junction-to-Ambient (Note F)

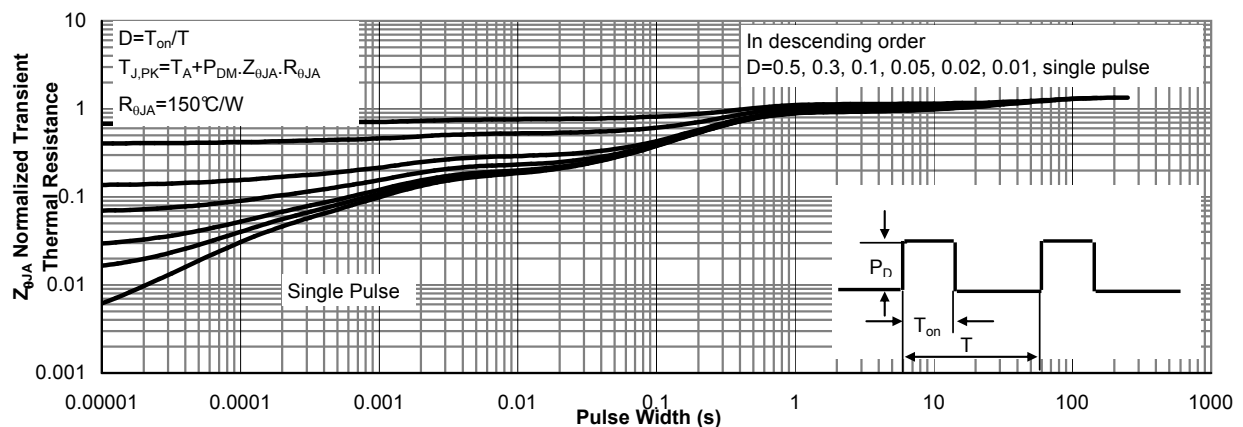


Figure 11: Normalized Maximum Transient Thermal Impedance (Note F)

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■ P-Channel Typical Characteristics

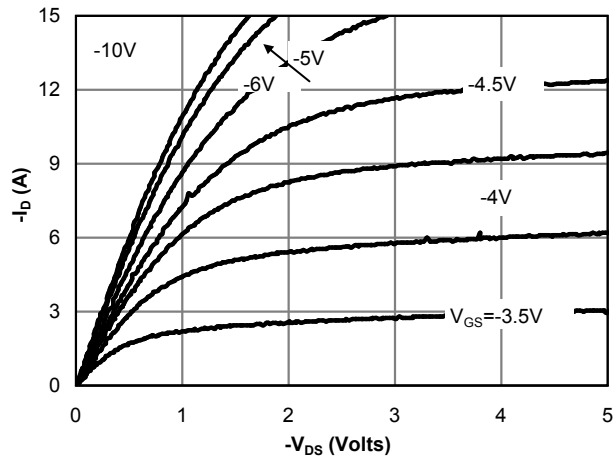


Fig 1: On-Region Characteristics (Note E)

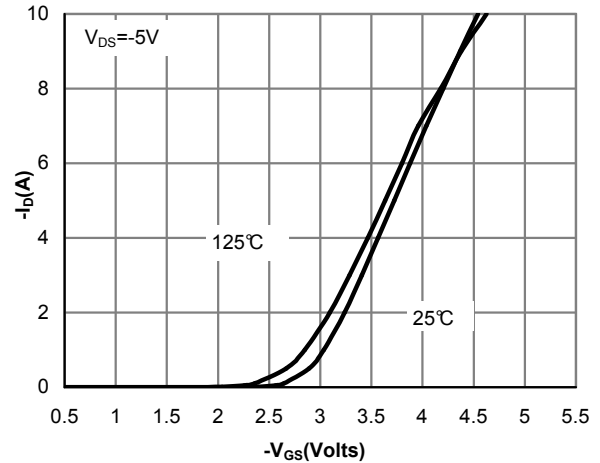


Figure 2: Transfer Characteristics (Note E)

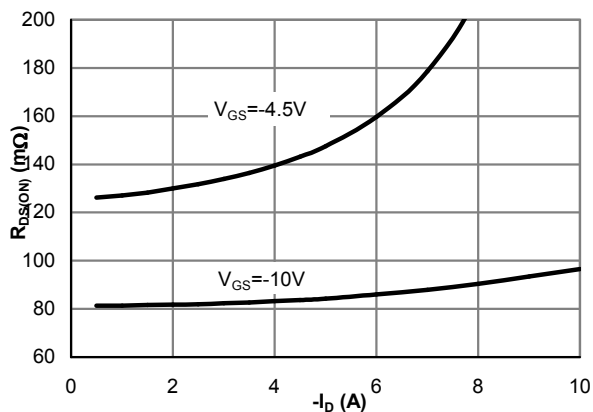


Figure 3: On-Resistance vs. Drain Current and Gate Voltage (Note E)

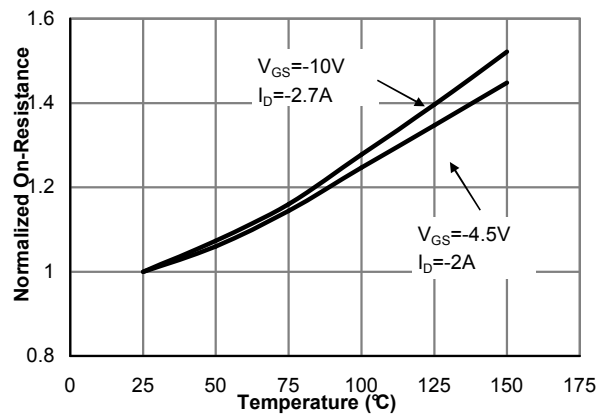


Figure 4: On-Resistance vs. Junction Temperature (Note E)

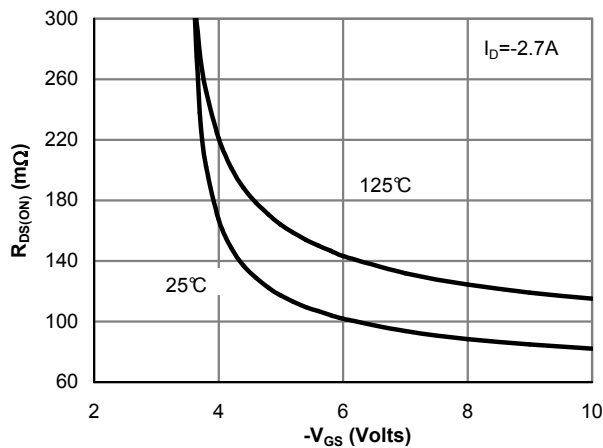


Figure 5: On-Resistance vs. Gate-Source Voltage (Note E)

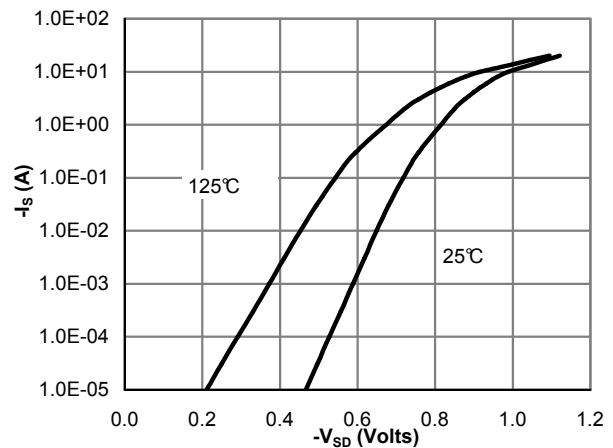


Figure 6: Body-Diode Characteristics (Note E)

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■ P-Channel Typical Characteristics

