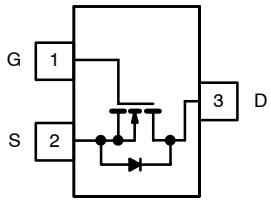
N-Channel 20-V (D-S) MOSFET

PRODUCT SUMMARY		
V_{DS} (V)	$r_{DS(on)}$ (Ω)	I_D (A)
20	0.033 @ V_{GS} = 4.5 V	4.9
	0.040 @ V_{GS} = 2.5 V	4.4
	0.051 @ V_{GS} = 1.8 V	3.9

(SOT-23)



Top View

TF2314 (AEXTF)

ABSOLUTE MAXIMUM RATINGS (T_A = 25°C UNLESS OTHERWISE NOTED)					
Parameter		Symbol	5 sec	Steady State	Unit
Drain-Source Voltage		V_{DS}	20		V
Gate-Source Voltage		V_{GS}	±12		
Continuous Drain Current (T_J = 150°C)[a]	T_A= 25°C	I_D	4.9	3.77	A
Pulsed Drain Current[b]		I_{DM}	15		
Avalanche Current[b]	L = 0.1 mH	I_{AS}	15		
Single Avalanche Energy		E_{AS}	11.25		mJ
Continuous Source Current (Diode Conduction)[a]		I_S	1.0		A
Power Dissipation[a]	T_A= 25°C	P_D	1.25	0.75	W
Operating Junction and Storage Temperature Range		T_J, T_{stg}	−55 to 150		°C

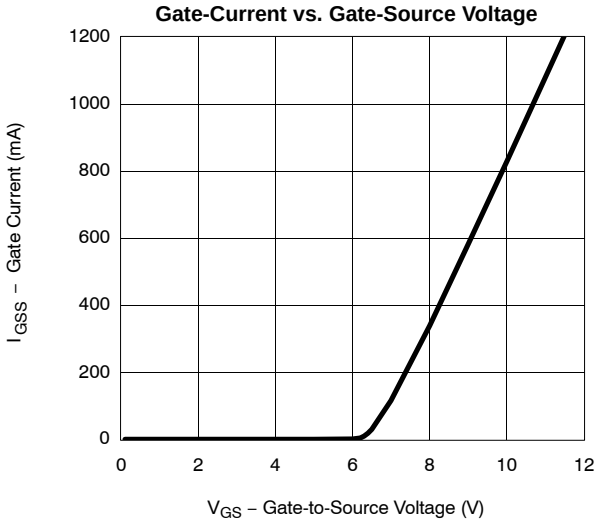
THERMAL RESISTANCE RATINGS					
Parameter		Symbol	Typical	Maximum	Unit
Maximum Junction-to-Ambient[a]	t ≤ 5 sec	R_{thJA}	75	100	°C/W
	Steady State		120	166	
Maximum Junction-to-Foot	Steady State	R_{thJF}	40	50	

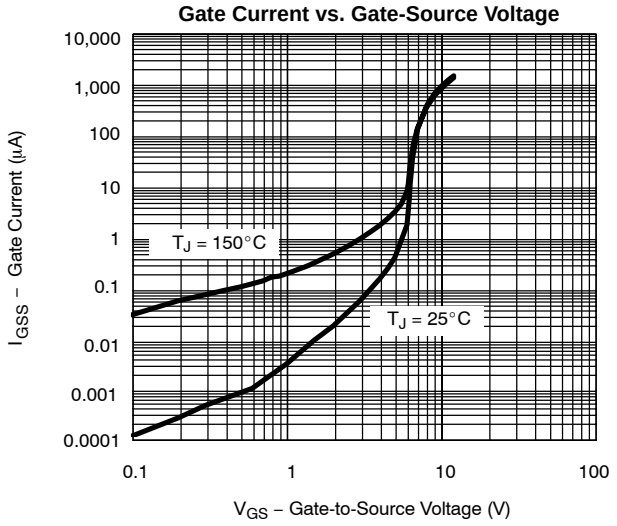
SPECIFICATIONS (T_A = 25°C UNLESS OTHERWISE NOTED)

Parameter	Symbol	Test Conditions	Limits Min	Limits Typ	Limits Max	Unit
Static						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	V_{GS} = 0 V, I_D = 250 µA	20			V
Gate-Threshold Voltage	$V_{GS(th)}$	V_{DS} = V_{GS}, I_D = 250 µA	0.45		0.95	V
Gate-Body Leakage	I_{GSS}	V_{DS} = 0 V, V_{GS} = ±12 V			±1.5	µA
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS} = 20 V, V_{GS} = 0 V			1	µA
		V_{DS} = 20 V, V_{GS} = 0 V, T_J = 70°C			75	µA
On-State Drain Current[a]	$I_{D(on)}$	V_{DS} ≥ 10 V, V_{GS} = 4.5 V	15			A
Drain-Source On-Resistance[a]	$r_{DS(on)}$	V_{GS} = 4.5 V, I_D = 5.0 A		0.027	0.033	Ω
		V_{GS} = 2.5 V, I_D = 4.5 A		0.033	0.040	Ω
		V_{GS} = 1.8 V, I_D = 4.0 A		0.042	0.051	Ω
Forward Transconductance[a]	g_{fs}	V_{DS} = 15 V, I_D = 5.0 A		40		S
Diode Forward Voltage	V_{SD}	I_S = 1.0 A, V_{GS} = 0 V		0.8	1.2	V
Dynamic[b]						
Total Gate Charge	Q_g	V_{DS} = 10 V, V_{GS} = 4.5 V, I_D = 5.0 A		11.0	14.0	nC
Gate-Source Charge	Q_{gs}			1.5		nC
Gate-Drain Charge	Q_{gd}			2.1		nC
Switching						
Turn-On Delay Time	$t_{d(on)}$	V_{DD} = 10 V, R_L = 10 Ω I_D ≅ 1.0 A, V_{GEN} = 4.5 V, R_g = 6 Ω		0.53	0.8	µs
Rise Time	t_r			1.4	2.2	µs
Turn-Off Delay Time	$t_{d(off)}$			13.5	20	µs
Fall-Time	t_f			5.9	9	µs
Source-Drain Reverse Recovery Time	t_{rr}	I_F = 1.0 A, di/dt = 100 A/µs		13	25	ns

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

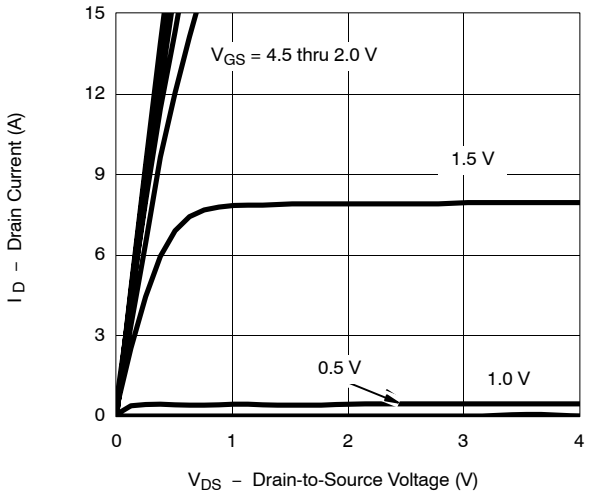
TYPICAL CHARACTERISTICS (25°C UNLESS NOTED)



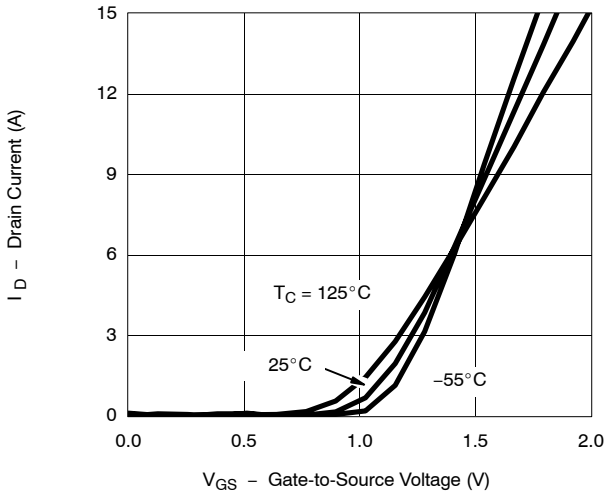


TYPICAL CHARACTERISTICS (25°C UNLESS NOTED)

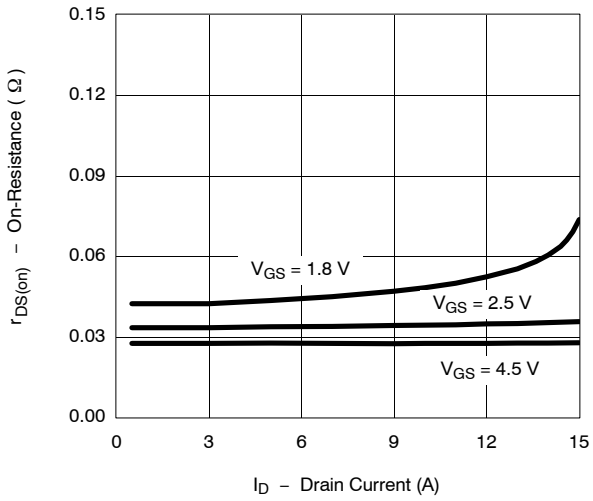
Output Characteristics



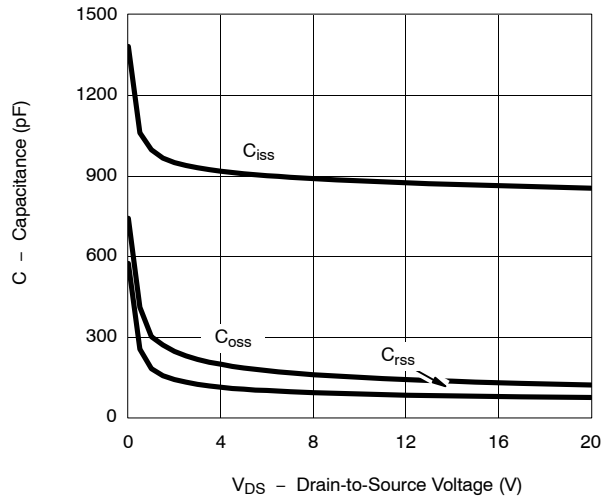
Transfer Characteristics



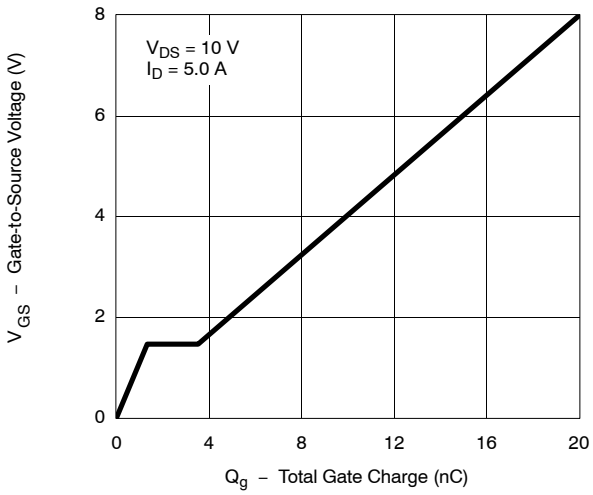
On-Resistance vs. Drain Current



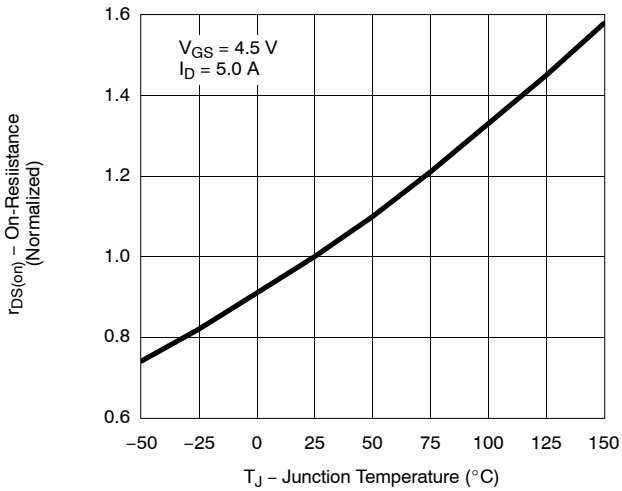
Capacitance



Gate Charge

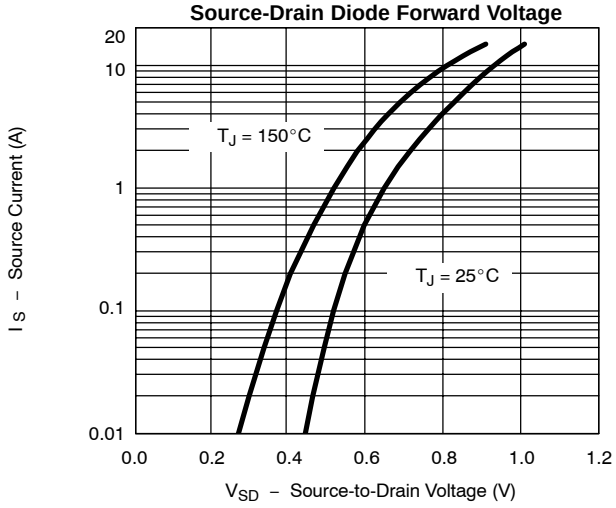


On-Resistance vs. Junction Temperature

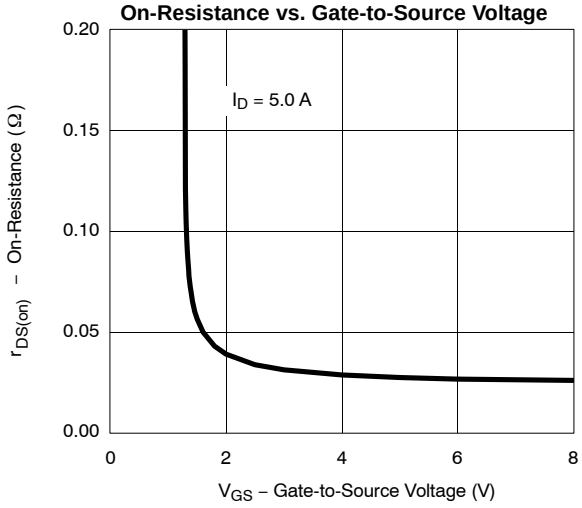


TYPICAL CHARACTERISTICS (25°C UNLESS NOTED)

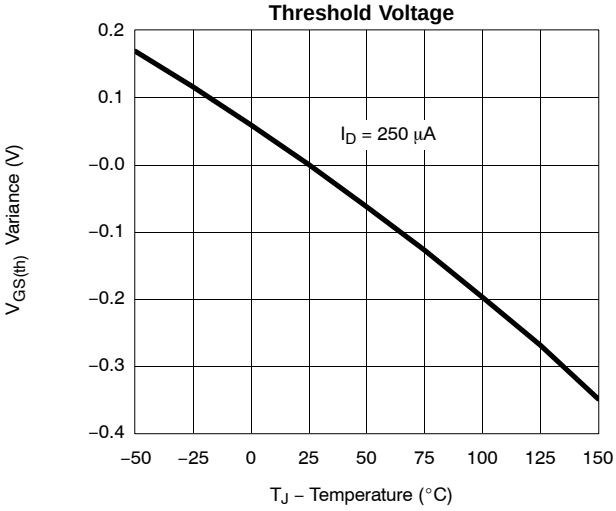
Source-Drain Diode Forward Voltage



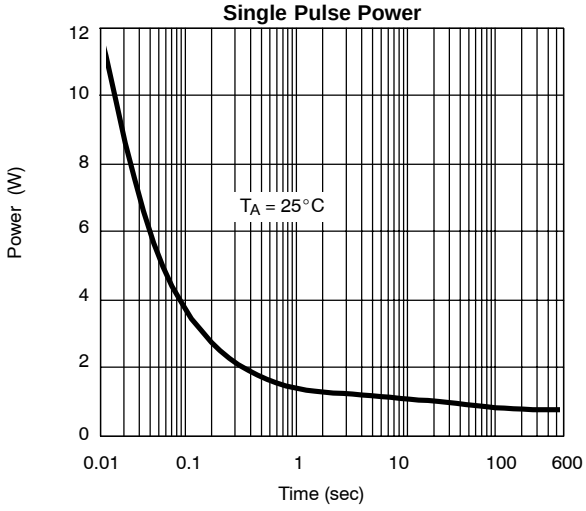
On-Resistance vs. Gate-to-Source Voltage



Threshold Voltage



Single Pulse Power



Normalized Thermal Transient Impedance, Junction-to-Ambient