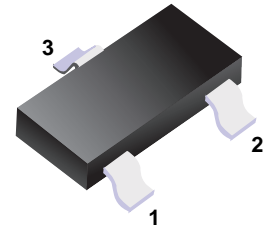


■ P-Channel Enhancement MOSFET

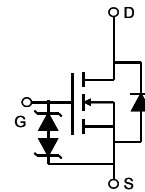
■ Features

- $V_{DS} (V) = -20V$
- $I_D = -3.5 A$
- $R_{DS(ON)} < 75m\Omega (V_{GS} = -10V)$
- $R_{DS(ON)} < 95m\Omega (V_{GS} = -4.5V)$
- $R_{DS(ON)} < 145m\Omega (V_{GS} = -2.5V)$



- 1. Gate
- 2. Source
- 3. Drain

■ Simplified outline(SOT23-3L)



■ MARKING

Marking	A19T
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■ Absolute Maximum Ratings $T_a = 25^\circ C$

Parameter	Symbol	Rating	Unit
Drain-Source Voltage	V_{DS}	-20	V
Gate-Source Voltage	V_{GS}	± 12	V
Continuous Drain Current *1 $T_A=25^\circ C$	I_D	-3.5	A
Current *1 $T_A=70^\circ C$		-2.8	
Pulsed Drain Current *2	I_{DM}	-15	
Power Dissipation *1 $T_A=25^\circ C$	P_D	1.4	W
		$T_A=70^\circ C$	
Thermal Resistance.Junction-to-Ambient	$R_{\theta JA}$	125	$^\circ C/W$
Thermal Resistance.Junction-to-Case	$R_{\theta JC}$	60	$^\circ C/W$
Junction and Storage Temperature Range	T_J, T_{STG}	-55 to 150	$^\circ C$

*1The value of $R_{\theta JA}$ is measured with the device mounted on 1in² FR-4 board with 2oz.

Copper, in a still air environment with $T_A = 25^\circ C$

*2 Repetitive rating, pulse width limited by junction temperature.

■ Electrical Characteristics Ta = 25 °C

Parameter	Symbol	Testconditions	Min	Typ	Max	Unit
Drain-Source Breakdown Voltage	V _{DSS}	I _D =250 μ A, V _{GS} =0V	-20			V
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} =-16V, V _{GS} =0V			-0.5	μ A
		V _{DS} =-16V, V _{GS} =0V, T _J =55 °C			-2.5	
Gate-Body leakage current	I _{GSS}	V _{DS} =0V, V _{GS} =±10V			±1	μ A
Gate Threshold Voltage	V _{GS(th)}	V _{DS} =V _{GS} I _D =-250 μ A	-0.7	-0.9	-1.4	V
Static Drain-Source On-Resistance	R _{DS(ON)}	V _{GS} =-10V, I _D =-3.5A		59	75	m Ω
		V _{GS} =-10V, I _D =-3.5A T _J =125 °C		83	105	
		V _{GS} =-4.5V, I _D =-3A		76	95	
		V _{GS} =-2.5V, I _D =-1A		111	145	
On state drain current	I _{D(ON)}	V _{GS} =-4.5V, V _{DS} =-5V	-15			A
Forward Transconductance	g _{FS}	V _{DS} =-5V, I _D =-3.5A		6.8		S
Input Capacitance	C _{iss}	V _{GS} =0V, V _{DS} =-10V, f=1MHz		512	620	pF
Output Capacitance	C _{oss}			77		pF
Reverse Transfer Capacitance	C _{rss}			62		pF
Gate resistance	R _g	V _{GS} =0V, V _{DS} =0V, f=1MHz		9.2	13	Ω
Total Gate Charge	Q _g	V _{GS} =-4.5V, V _{DS} =-10V, I _D =-3.5A		5.5	6.6	nC
Gate Source Charge	Q _{gs}			0.8		nC
Gate Drain Charge	Q _{gd}			1.9		nC
Turn-On DelayTime	t _{D(on)}	V _{GS} =-10V, V _{DS} =-10V, R _L =2.8 Ω, R _{GEN} =3 Ω		5		ns
Turn-On Rise Time	t _r			6.7		ns
Turn-Off DelayTime	t _{D(off)}			28		ns
Turn-Off Fall Time	t _f			13.5		ns
Body Diode Reverse Recovery Time	t _{rr}		I _F =-3.5A, di/dt=100A/μs		9.8	12
Body Diode Reverse Recovery Charge	Q _{rr}	I _F =-3.5A, di/dt=100A/μs		2.7		nC
Maximum Body-Diode Continuous Current	I _S				-2	A
Diode Forward Voltage	V _{SD}	I _S =-1A, V _{GS} =0V	-0.65	-0.81	-0.95	V

■ Typical Characteristics

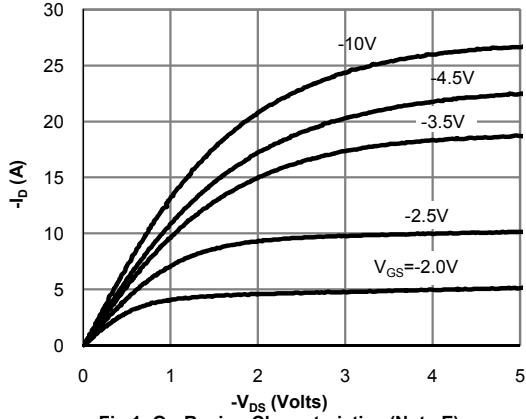


Fig 1: On-Region Characteristics (Note E)

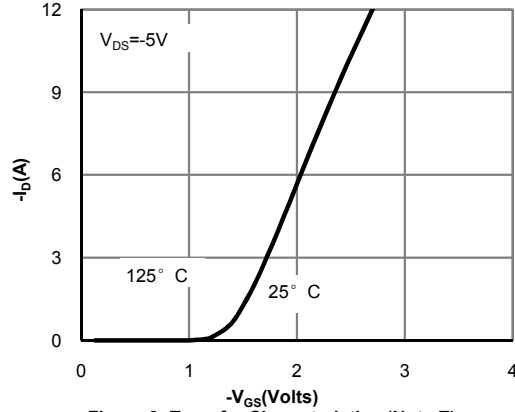


Figure 2: Transfer Characteristics (Note E)

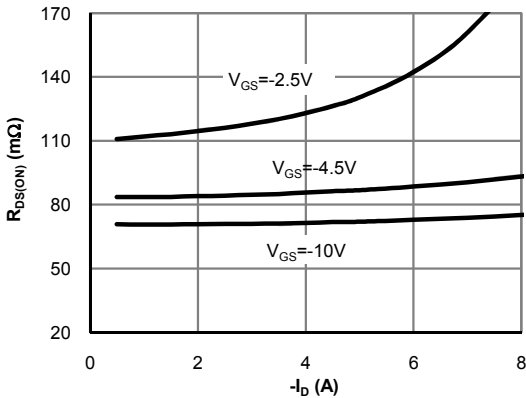


Figure 3: On-Resistance vs. Drain Current and Gate Voltage (Note E)

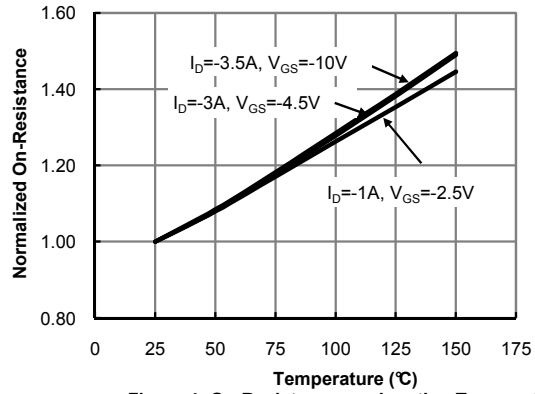


Figure 4: On-Resistance vs. Junction Temperature (Note E)

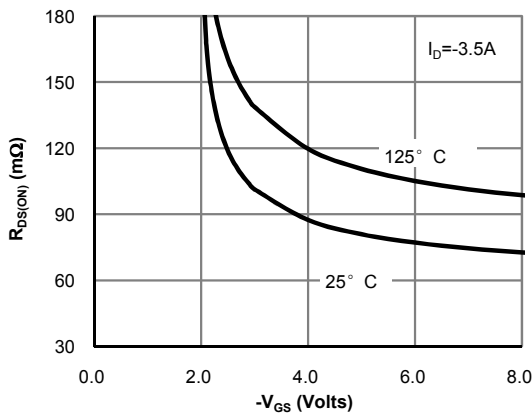


Figure 5: On-Resistance vs. Gate-Source Voltage (Note E)

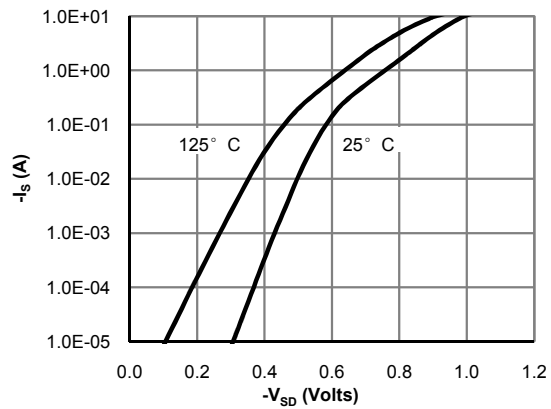


Figure 6: Body-Diode Characteristics (Note E)

■ Typical Characteristics

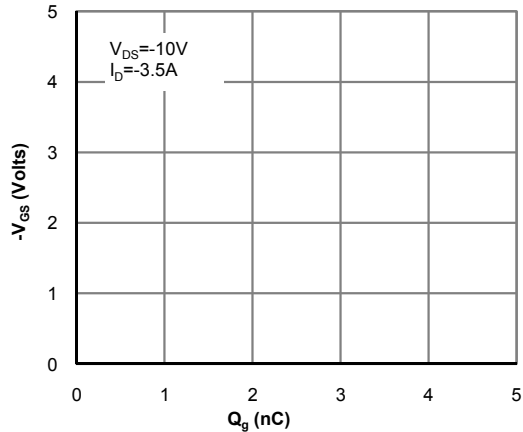


Figure 7: Gate-Charge Characteristics

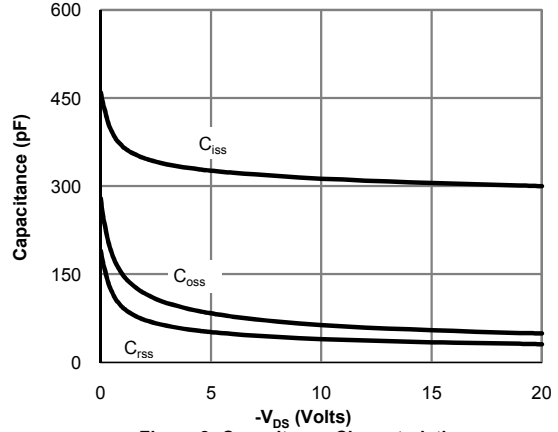


Figure 8: Capacitance Characteristics

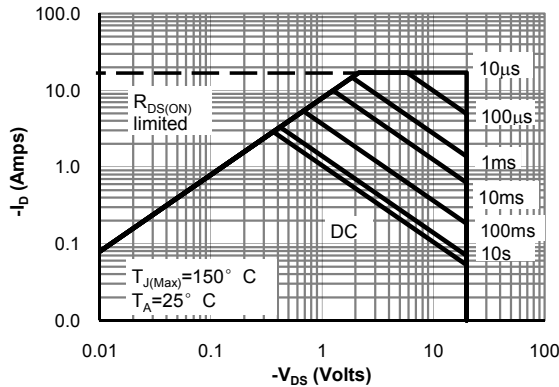


Figure 9: Maximum Forward Biased Safe Operating Area (Note F)

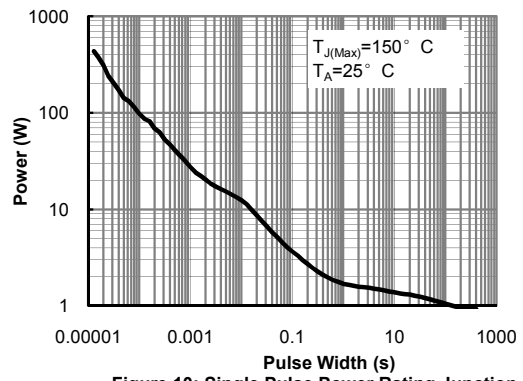


Figure 10: Single Pulse Power Rating Junction-to-Ambient (Note F)

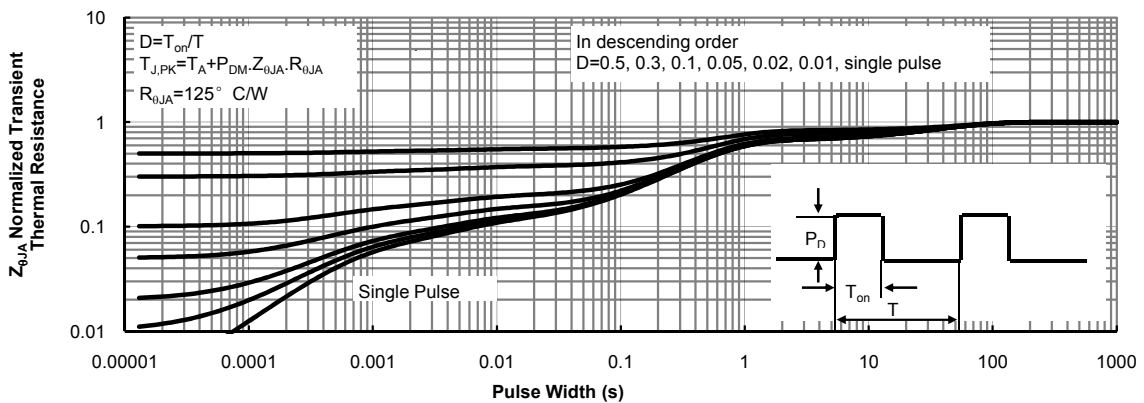
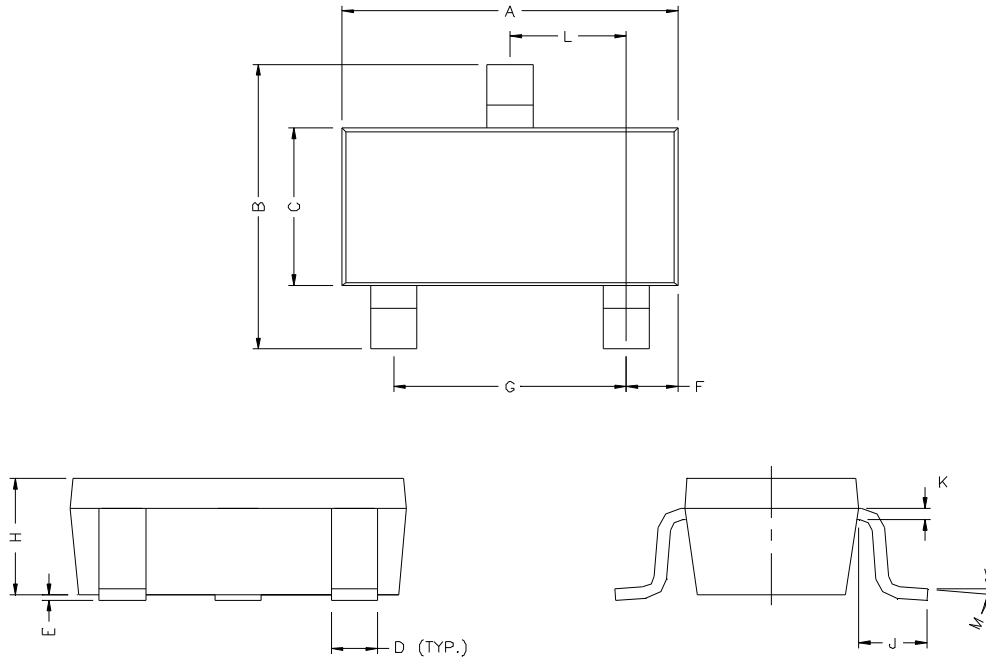


Figure 11: Normalized Maximum Transient Thermal Impedance (Note F)

Package Outline

SOT23-3L



DIMENSIONS (mm are the original dimensions)

UNIT	A	B	C	D	E	F	G	H	K	J	L	M
mm	2.70 3.10	2.65 2.95	1.50 1.70	0.35 0.50	0 0.10	0.45 0.55	1.9	1.00 1.30	0.10 0.20	0.40 -	0.85 1.15	0° 10°

Summary of Packing Options

Package	Package Description	Packing Quantity	Industry Standard
SOT23-3L	Tape/Reel, 7" reel	3000	EIA-481-1