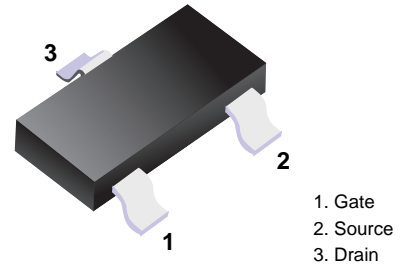


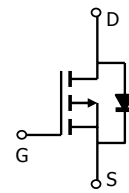
■ P-Channel Enhancement MOSFET



■ Features

- $V_{DS} (V) = -30V$
- $I_D = -4.2 A (V_{GS} = -10V)$
- $R_{DS(ON)} < 50m\Omega (V_{GS} = -10V)$
- $R_{DS(ON)} < 65m\Omega (V_{GS} = -4.5V)$
- $R_{DS(ON)} < 120m\Omega (V_{GS} = -2.5V)$

■ Simplified outline(SOT23-3L)



■ MARKING

Marking	3401
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■ Absolute Maximum Ratings  $T_a = 25^\circ C$

Parameter	Symbol	Rating	Unit	
Drain-Source Voltage	$V_{DS}$	-30	V	
Gate-Source Voltage	$V_{GS}$	$\pm 12$		
Continuous Drain Current	$I_D$	$T_a = 25^\circ C$	-4.2	A
		$T_a = 70^\circ C$	-3.5	
Pulsed Drain Current	$I_{DM}$	-30		
Power Dissipation	$P_D$	$T_a = 25^\circ C$	1.4	W
		$T_a = 70^\circ C$	1	
Thermal Resistance.Junction- to-Ambient $t \leq 10s$	$R_{thJA}$		90	$^\circ C/W$
Thermal Resistance.Junction- to-Ambient			125	
Thermal Resistance.Junction- to-Case		$R_{thJC}$	60	
Junction Temperature	$T_J$	150	$^\circ C$	
Junction and Storage Temperature Range	$T_{stg}$	-55 to 150		

**■ Electrical Characteristics Ta = 25°C**

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Drain-Source Breakdown Voltage	V <sub>DSS</sub>	I <sub>D</sub> =-250 μ A, V <sub>GS</sub> =0V	-30			V
Zero Gate Voltage Drain Current	I <sub>DSS</sub>	V <sub>DS</sub> =-24V, V <sub>GS</sub> =0V			-1	μ A
		V <sub>DS</sub> =-24V, V <sub>GS</sub> =0V, T <sub>J</sub> =55°C			-5	
Gate-Body leakage current	I <sub>GSS</sub>	V <sub>DS</sub> =0V, V <sub>GS</sub> =±12V			±100	nA
Gate Threshold Voltage	V <sub>GS(th)</sub>	V <sub>DS</sub> =V <sub>GS</sub> I <sub>D</sub> =-250 μ A	-0.4	-1	-1.3	V
Static Drain-Source On-Resistance	R <sub>DS(on)</sub>	V <sub>GS</sub> =-10V, I <sub>D</sub> =-4.2A		42	50	mΩ
		V <sub>GS</sub> =-10V, I <sub>D</sub> =-4.2A T <sub>J</sub> =125°C			75	
		V <sub>GS</sub> =-4.5V, I <sub>D</sub> =-4A		53	65	
		V <sub>GS</sub> =-2.5V, I <sub>D</sub> =-1A		80	120	
On state drain current	I <sub>D(ON)</sub>	V <sub>GS</sub> =-4.5V, V <sub>DS</sub> =-5V	-25			A
Forward Transconductance	g <sub>FS</sub>	V <sub>DS</sub> =-5V, I <sub>D</sub> =-5A	7	11		S
Input Capacitance	C <sub>iss</sub>	V <sub>GS</sub> =0V, V <sub>DS</sub> =-15V, f=1MHz		954		pF
Output Capacitance	C <sub>oss</sub>			115		
Reverse Transfer Capacitance	C <sub>rss</sub>			77		
Gate resistance	R <sub>g</sub>	V <sub>GS</sub> =0V, V <sub>DS</sub> =0V, f=1MHz		6		Ω
Total Gate Charge	Q <sub>g</sub>	V <sub>GS</sub> =-4.5V, V <sub>DS</sub> =-15V, I <sub>D</sub> =-4A		9.4		nC
Gate Source Charge	Q <sub>gs</sub>			2		
Gate Drain Charge	Q <sub>gd</sub>			3		
Turn-On DelayTime	t <sub>d(on)</sub>	V <sub>GS</sub> =-10V, V <sub>DS</sub> =-15V, R <sub>L</sub> =3.6 Ω, R <sub>GEN</sub> =6 Ω		6.3		ns
Turn-On Rise Time	t <sub>r</sub>			3.2		
Turn-Off DelayTime	t <sub>d(off)</sub>			38.3		
Turn-Off Fall Time	t <sub>f</sub>			12		
Body Diode Reverse Recovery Time	t <sub>rr</sub>	I <sub>F</sub> =-4A, di/dt=100A/μ s		20.2		
Body Diode Reverse Recovery Charge	Q <sub>rr</sub>	I <sub>F</sub> =5A, di/dt=100A/μ s		11.2		nC
Maximum Body-Diode Continuous Current	I <sub>S</sub>				-2.2	A
Diode Forward Voltage	V <sub>SD</sub>	I <sub>S</sub> =-1A, V <sub>GS</sub> =0V		-0.75	-1	V

■ Typical Characteristics

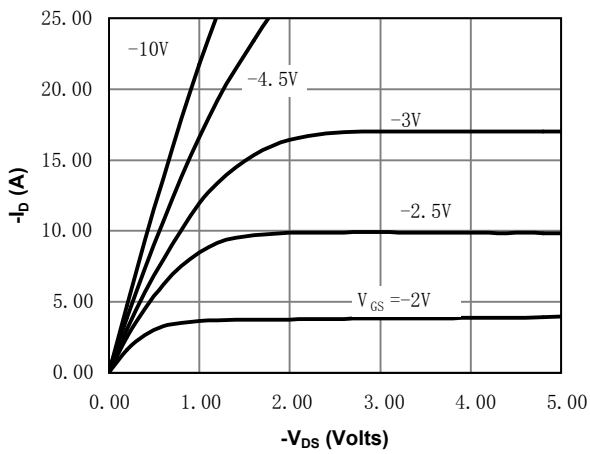


Fig 1: On-Region Characteristics

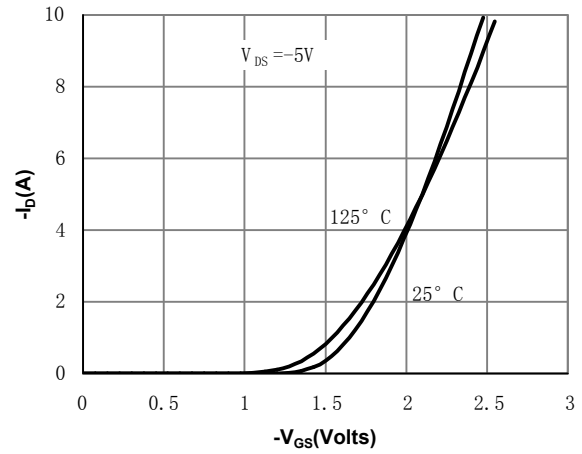


Figure 2: Transfer Characteristics

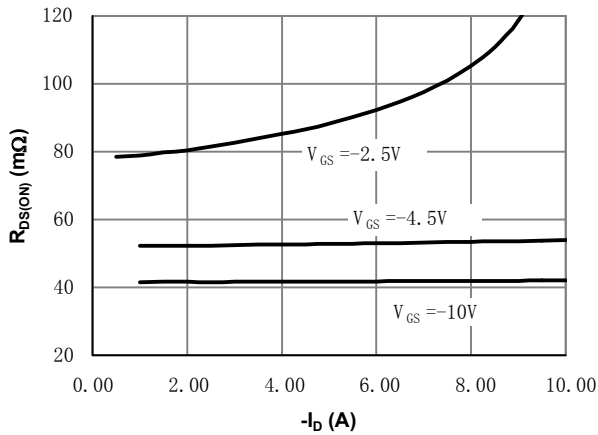


Figure 3: On-Resistance vs. Drain Current and Gate Voltage

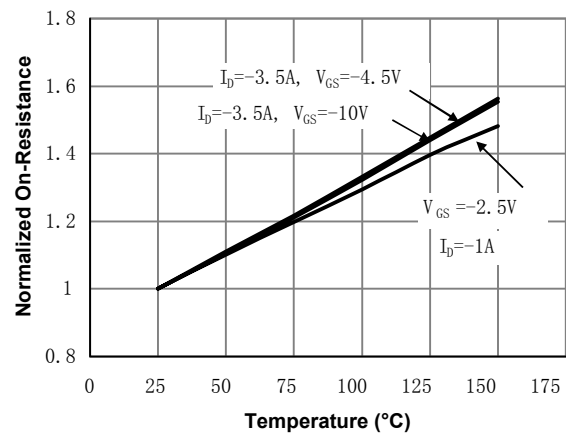


Figure 4: On-Resistance vs. Junction Temperature

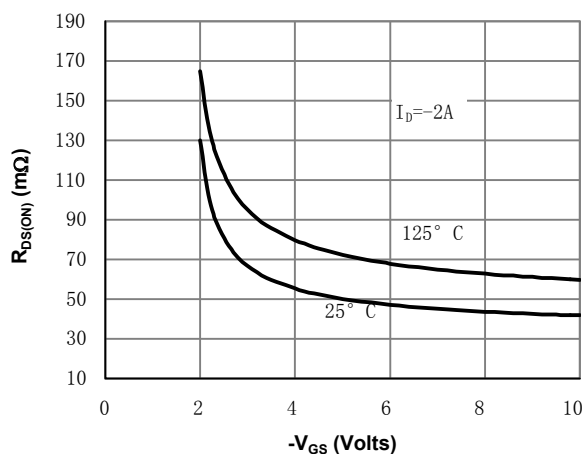


Figure 5: On-Resistance vs. Gate-Source Voltage

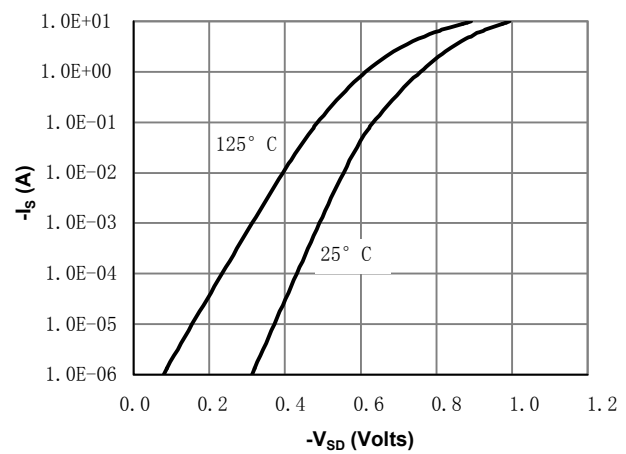


Figure 6: Body-Diode Characteristics

■ Typical Characteristics

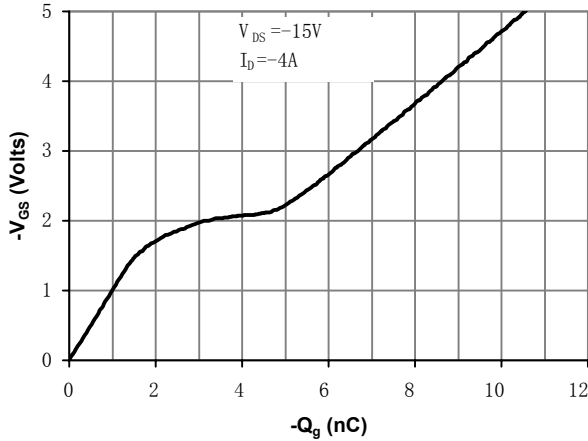


Figure 7: Gate-Charge Characteristics

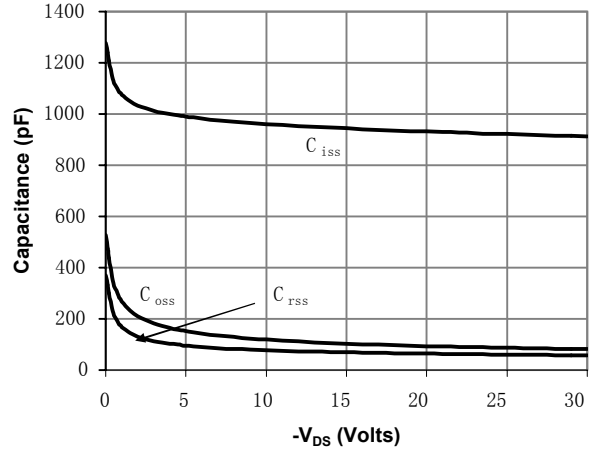


Figure 8: Capacitance Characteristics

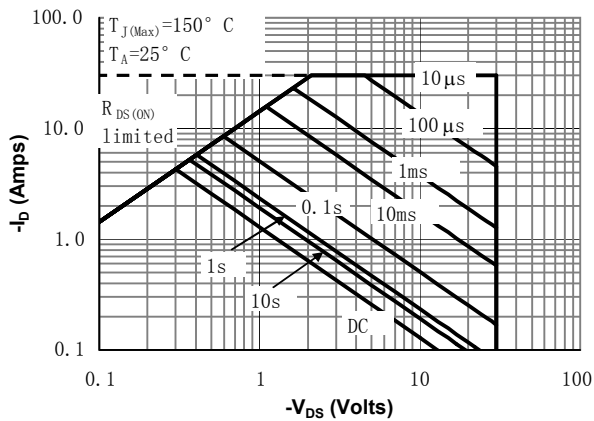


Figure 9: Maximum Forward Biased Safe Operating Area (Note E)

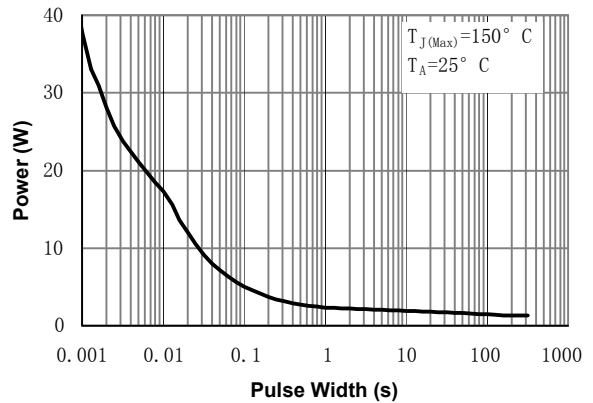


Figure 10: Single Pulse Power Rating Junction-to-Ambient (Note E)

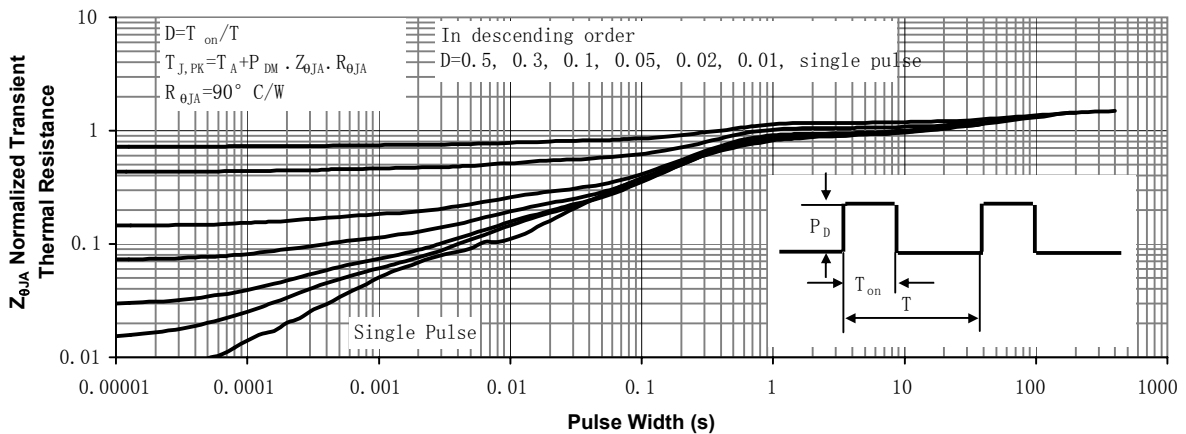
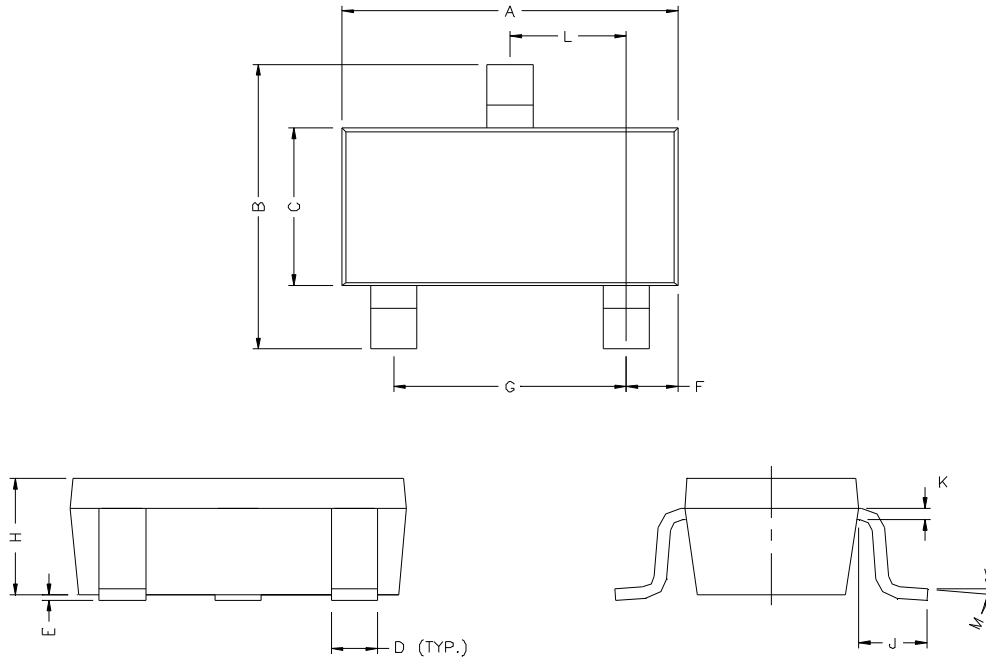


Figure 11: Normalized Maximum Transient Thermal Impedance

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