

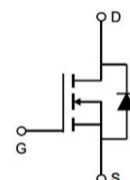
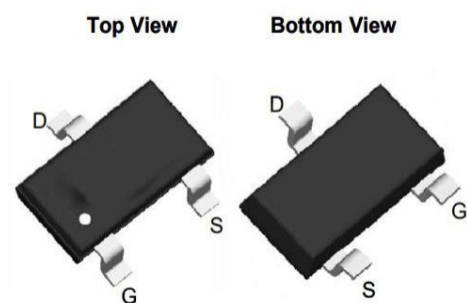
30V /4A Single N Power MOSFET
General Description

30V /4A Single N Power MOSFET

Very low on-resistance $R_{DS(on)}$ @ $V_{GS}=4.5\text{ V}$

Pb-free lead plating; RoHS compliant

V_{DS}	30	V
$R_{DS(on),TYP@V_{GS}=10V}$	45.5	mΩ
$R_{DS(on),TYP@V_{GS}=4.5}$	71.5	mΩ
I_D	4	A



Part ID	Package Type	Marking	Tape and reel information
SM3402SRL	SOT23-3	A09T	3000



100% UIS Tested
100% Rg Tested

Parameter		Symbol	Maximum	Units
Drain-Source Voltage		V_{DS}	30	V
Gate-Source Voltage		V_{GS}	12	±V
Continuous Drain Current A	$T_A=25^{\circ}\text{C}$	I_D	4.0	A
	$T_A=70^{\circ}\text{C}$		3.2	
Pulsed Drain Current B		I_{DM}	6.4	
Avalanche Current G		I_{AR}	1.3	
Repetitive avalanche energy $L=0.1\text{mH}$ G		E_{AR}	2.9	mJ
Power Dissipation A	$T_A=25^{\circ}\text{C}$	P_D	1.4	W
	$T_A=70^{\circ}\text{C}$		0.9	
Junction and Storage Temperature Range		T_J, T_{STG}	-55 to 150	$^{\circ}\text{C}$

Thermal Characteristics

Parameter		Symbol	Typ	Max	Units
Maximum Junction-to-Ambient A	$t \leq 10\text{s}$	$R_{\theta JA}$	162	243	$^{\circ}\text{C/W}$
Maximum Junction-to-Ambient A	Steady State		325	390	$^{\circ}\text{C/W}$
Maximum Junction-to-Lead c	Steady State	$R_{\theta JL}$	97	156	$^{\circ}\text{C/W}$

STATIC PARAMETERS

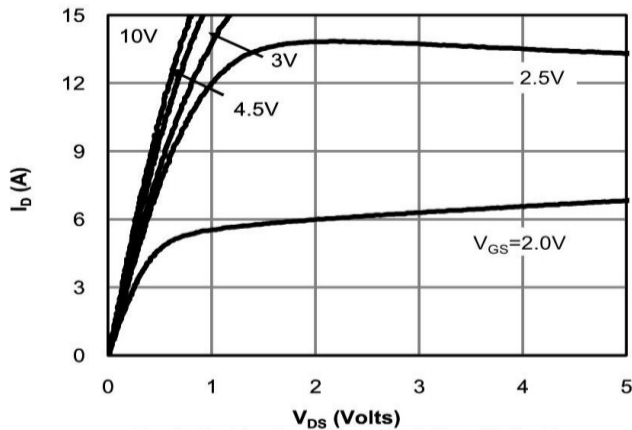
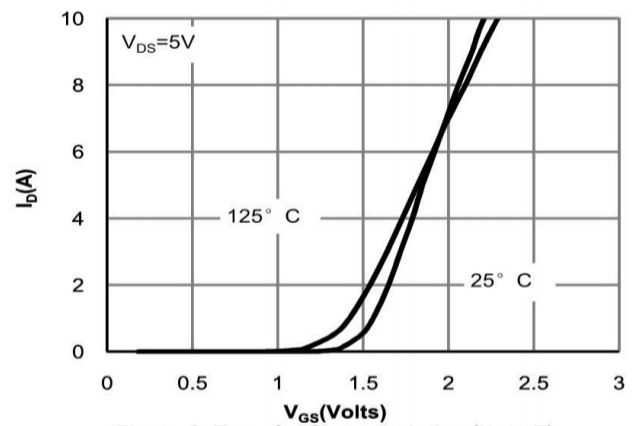
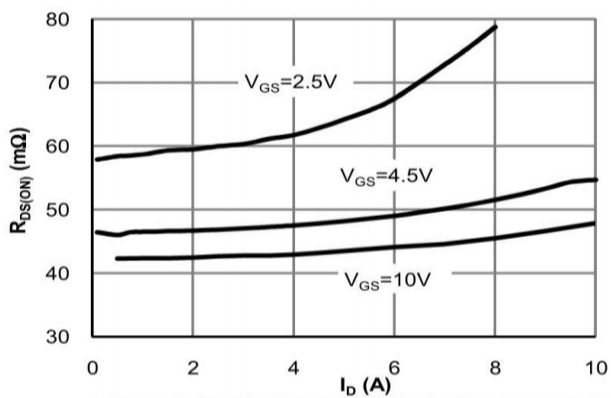
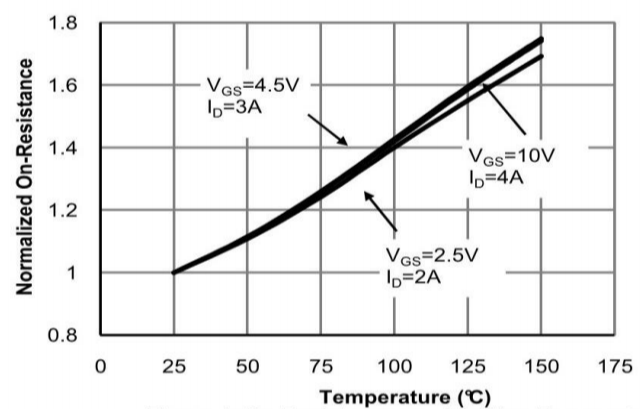
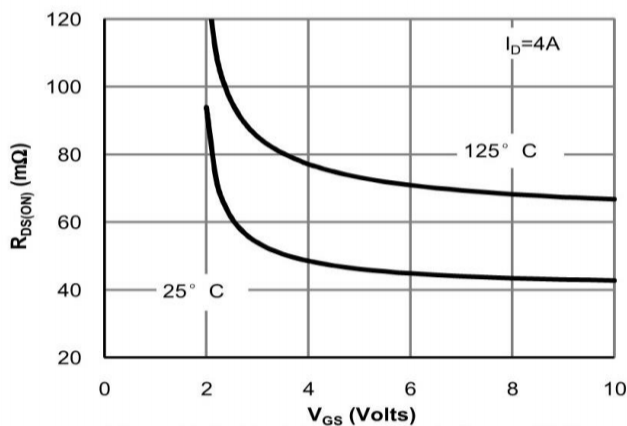
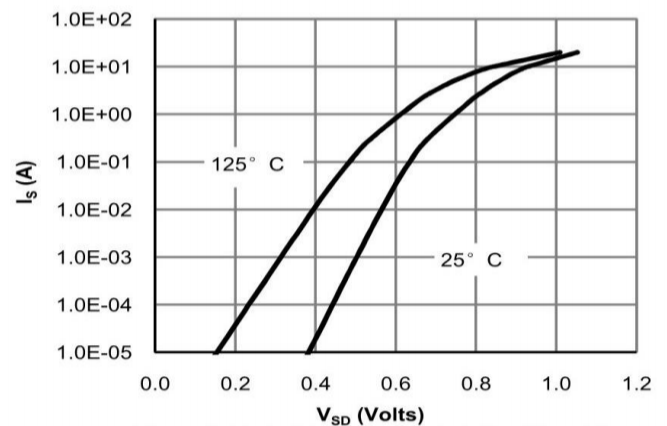
Symbol	Parameter	Conditions	Min	Typ	Max	Units
BV _{DSS}	Drain-Source Breakdown Voltage	I _D = -250uA, V _{GS} = 0V	30			V
I _{DSS}	Zero Gate Voltage Drain Current	V _{DS} =30V, V _{GS} =0V			1	uA
					5	
I _{GSS}	Gate-Body leakage current	V _{DS} = 0V, V _{GS} = ±20V			±100	nA
V _{GS(th)}	Gate Threshold Voltage	V _{DS} = V _{GS} I _D = 250μA	0.8	1.1	1.5	V
R _{DS(ON)}	Static Drain-Source On-Resistance	V _{GS} =-10V, I _D =4A		45.5	65.0	mΩ
		V _{GS} =4.5V, I _D =4A		71.5	93.0	
g _{FS}	Forward Transconductance	V _{DS} =5V, I _D =4A		70		S
V _{SD}	Diode Forward Voltage	I _S =1A, V _{GS} =5V		0.72	1	V
I _S	Maximum Body-Diode Continuous Current				4	A

DYNAMIC PARAMETERS

Symbol	Parameter	Conditions	Min	Typ	Max	Units
C _{iss}	Input Capacitance	V _{GS} =0V, V _{DS} =15V, f=1MHz		235	286	pF
C _{oss}	Output Capacitance			35	43	pF
C _{rss}	Reverse Transfer Capacitance			18	21	pF
R _g	Gate resistance	V _{GS} =0V, V _{DS} =0V, f=1MHz			0.8	Ω

SWITCHING PARAMETERS

Symbol	Parameter	Conditions	Min	Typ	Max	Units
Q _g (10V)	Total Gate Charge	V _{GS} =10V, V _{DS} =15V, I _D =4A		4.7		nC
Q _g 4.5V)	Total Gate Charge			2.35		
Q _{gs}	Gate Source Charge			1.12		
Q _{gd}	Gate Drain Charge			1.6		
t _{D(on)}	Turn-On DelayTime	V _{GS} =10V, V _{DS} =15V, R _L =0.75Ω, R _{GEN} =3Ω		4.25		ns
t _r	Turn-On Rise Time			3.4		
t _{D(off)}	Turn-Off DelayTime			11.9		
t _f	Turn-Off Fall Time			3.825		
t _{rr}	Body Diode Reverse Recovery Time	I _F =-8A, dI/dt=500A/μs		8.5		ns
Q _{rr}	Body Diode Reverse Recovery Charge	I _F =18A, dI/dt=500A/μs		2.6		nC

TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS

Figure 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 ELECTRICAL AND THERMAL CHARACTERISTICS

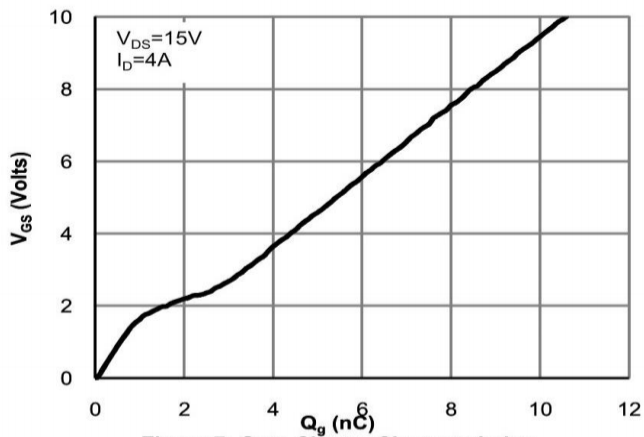


Figure 7: Gate-Charge Characteristics

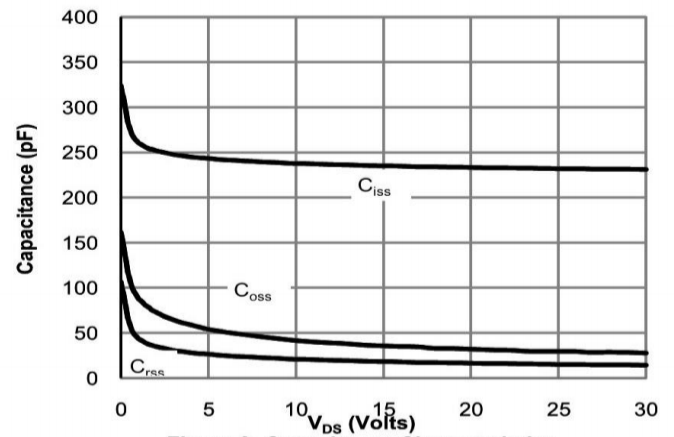


Figure 8: Capacitance Characteristics

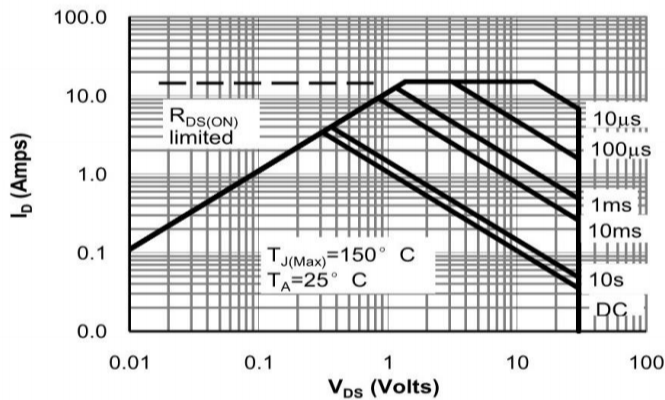


Figure 9: Maximum Forward Biased Safe Operating Area (Note F)

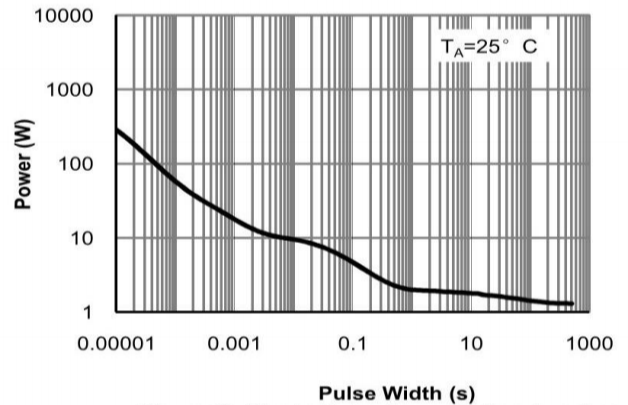


Figure 10: Single Pulse Power Rating Junction-to-Ambient (Note F)

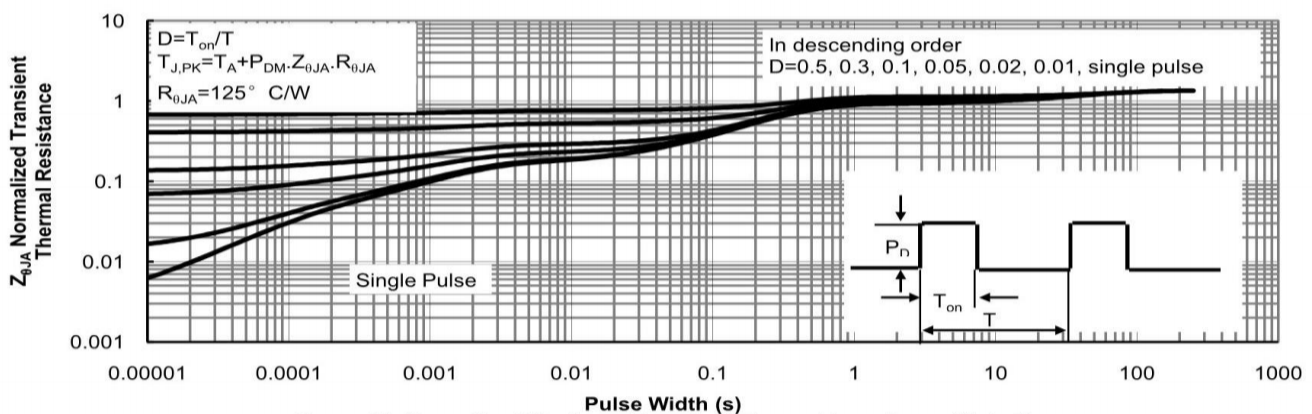


Figure 11: Normalized Maximum Transient Thermal Impedance (Note F)