SM4146T9RL

30V /55A Single N Power MOSFET

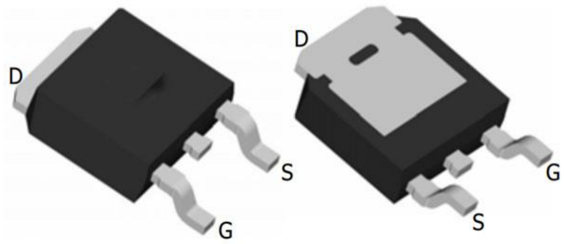
General Description

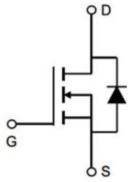
30V /55A Single N Power MOSFET

Very low on-resistance RDS(on) @ VGS=4.5 V

Pb-free lead plating; RoHS compliant

V_{DS}	30	V
$R_{DS(on),TYP@VGS=10V}$	3.9	mΩ
$R_{DS(on),TYP@VGS=4.5}$	6.7	mΩ
I_D	55	A





Part ID	Package Type	Marking	Tape and reel infomation
SM4146T9RL	TO-252	55N03	2500

100% UIS Tested
100% Rg Tested

Parameter		Symbol	Maximum	Units
Drain-Source Voltage		V_{DS}	30	V
Gate-Source Voltage		V_{GS}	20	±V
Continuous Drain Current A	T_A=25°C	I_D	55.0	A
	T_A=70°C		43*	
Pulsed Drain Current B		I_{DM}	88.0	
Avalanche Current G		I_{AR}	17.6	
Repetitive avalanche energy L=0.1mH G		E_{AR}	40.5	mJ
Power Dissipation A	T_A=25°C	P_D	62	W
	T_A=70°C		31*	
Junction and Storage Temperature Range		T_J, T_{STG}	-55 to 150	°C

Thermal Characteristics

Parameter		Symbol	Typ	Max	Units
Maximum Junction-to-Ambient A	t ≤ 10s	$R_{\theta JA}$	23	35	°C/W
Maximum Junction-to-Ambient A	Steady State		47	57	°C/W
Maximum Junction-to-Lead C	Steady State	$R_{\theta JL}$	14	22	°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	VDS=30V, VGS=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	1.5	2.3	3	V
$R_{DS(ON)}$	Static Drain-Source On-Resistance	VGS=10V, ID=20A		3.9	5.6	mΩ
		VGS=4.5V, ID=20A		6.7	9.5	
g_{FS}	Forward Transconductance	VDS=5V, ID=20A		67		S
V_{SD}	Diode Forward Voltage	IS=1A,VGS=182V		0.72	1	V
I_S	Maximum Body-Diode Continuous Current				55	A

DYNAMIC PARAMETERS

Symbol	Parameter	Conditions	Min	Typ	Max	Units
C_{iss}	Input Capacitance	VGS=0V, VDS=15V, f=1MHz		2037	2485	pF
C_{oss}	Output Capacitance			375	461	pF
C_{rss}	Reverse Transfer Capacitance			220	261	pF
R_g	Gate resistance	VGS=0V, VDS=0V, f=1MHz			2.3	Ω

SWITCHING PARAMETERS

Symbol	Parameter	Conditions	Min	Typ	Max	Units
Q_g (10V)	Total Gate Charge	VGS=10V, VDS=15V, ID=20A		16		nC
Q_g 4.5V)	Total Gate Charge			8		
Q_{gs}	Gate Source Charge			3.22		
Q_{gd}	Gate Drain Charge			4.6		
$t_{D(on)}$	Turn-On DelayTime	VGS=10V, VDS=15V,RL=0.75Ω, RGEN=3Ω		5		ns
t_r	Turn-On Rise Time			4		
$t_{D(off)}$	Turn-Off DelayTime			14		
t_f	Turn-Off Fall Time			4.5		
t_{rr}	Body Diode Reverse Recovery Time	I_F=-8A, dI/dt=500A/μs		10		ns
Q_{rr}	Body Diode Reverse Recovery Charge	I_F=18A, dI/dt=500A/μs		15		nC