



SPN2054

N-Channel Enhancement Mode MOSFET

DESCRIPTION

The SPN2054 is the N-Channel logic enhancement mode power field effect transistors are produced using high cell density , DMOS trench technology.

This high density process is especially tailored to minimize on-state resistance. These devices are particularly suited for low voltage application, such as DC/DC converter and Desktop computer power management.

The package is universally preferred for commercial industrial surface mount applications

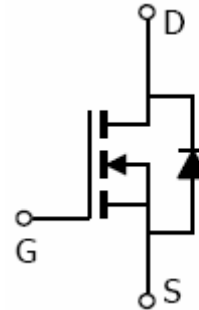
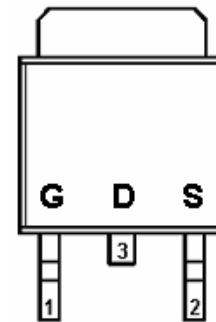
FEATURES

- ◆ 20V/12A, $R_{DS(ON)}=40m\Omega@V_{GS}=10V$
- ◆ 20V/ 7A, $R_{DS(ON)}=45m\Omega@V_{GS}=4.5V$
- ◆ 20V/ 4A, $R_{DS(ON)}=50m\Omega@V_{GS}=2.5V$
- ◆ 20V/ 2A, $R_{DS(ON)}=60m\Omega@V_{GS}=1.8V$
- ◆ Super high density cell design for extremely low RDS (ON)
- ◆ Exceptional on-resistance and maximum DC current capability
- ◆ TO-252-2L package design

APPLICATIONS

- Power Management in Desktop Computer
- DC/DC Converter
- LCD Display inverter

PIN CONFIGURATION(TO-252-2L)



PART MARKING



A : Lot Code
B : Date Code



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PIN DESCRIPTION

Pin	Symbol	Description
1	G	Gate
2	S	Source
3	D	Drain

ORDERING INFORMATION

Part Number	Package	Part Marking
SPN2054T252RG	TO-252-2L	SPN2054

※ Week Code : A ~ Z (1 ~ 26) ; a ~ z (27 ~ 52)

※ SPN2054T252RG : Tape Reel ; Pb – Free

ABSOLUTE MAXIMUM RATINGS

($T_A=25^{\circ}\text{C}$ Unless otherwise noted)

Parameter	Symbol	Typical	Unit
Drain-Source Voltage	V_{DSS}	20	V
Gate –Source Voltage	V_{GSS}	± 12	V
Continuous Drain Current($T_J=150^{\circ}\text{C}$)	ID	$T_A=25^{\circ}\text{C}$ 12	A
		$T_A=70^{\circ}\text{C}$ 8	
Pulsed Drain Current	I_{DM}	20	A
Continuous Source Current(Diode Conduction)	I_S	12	A
Power Dissipation	PD	$T_A=25^{\circ}\text{C}$ 40	W
		$T_A=70^{\circ}\text{C}$ 20	
Operating Junction Temperature	T_J	-55/150	$^{\circ}\text{C}$
Storage Temperature Range	T_{STG}	-55/150	$^{\circ}\text{C}$
Thermal Resistance-Junction to Ambient	$R_{\theta JA}$	105	$^{\circ}\text{C}/\text{W}$



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ELECTRICAL CHARACTERISTICS

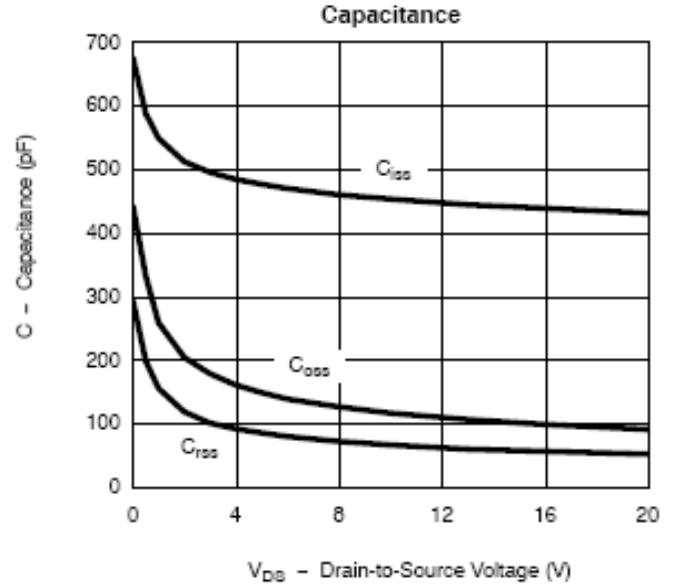
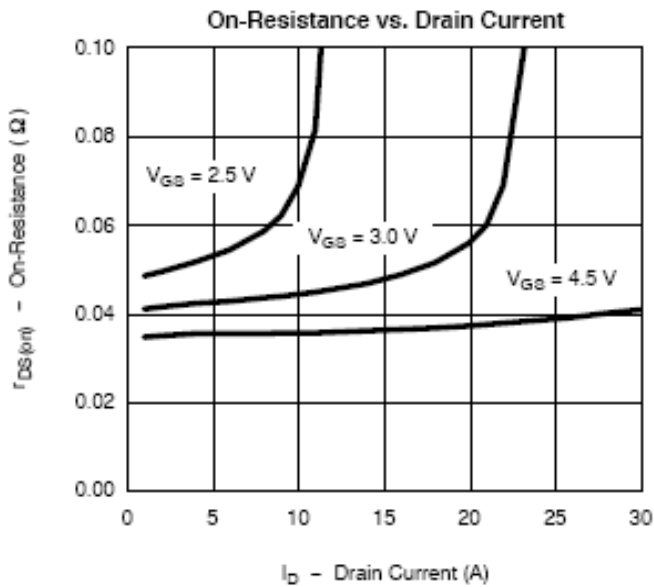
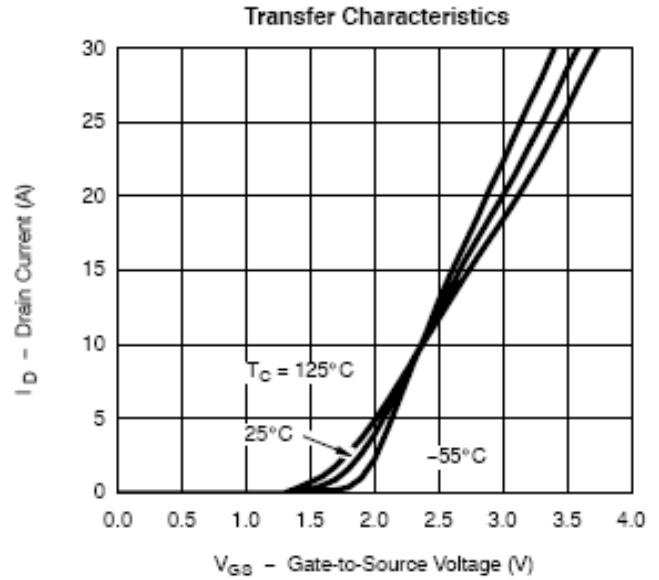
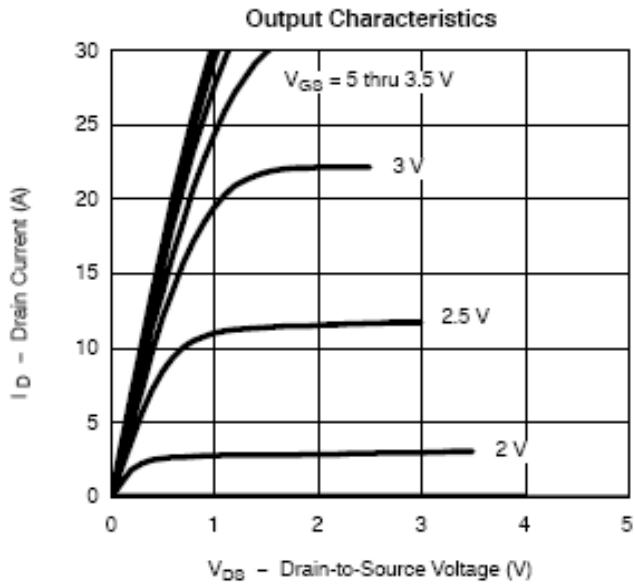
(T_A=25°C Unless otherwise noted)

Parameter	Symbol	Conditions	Min.	Typ	Max.	Unit
Static						
Drain-Source Breakdown Voltage	V _{(BR)DSS}	V _{GS} =0V, I _D =250μA	20			V
Gate Threshold Voltage	V _{GS(th)}	V _{DS} =V _{GS} , I _D =250μA	0.36		1.0	
Gate Leakage Current	I _{GSS}	V _{DS} =0V, V _{GS} =±12V			±100	nA
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} =20V, V _{GS} =0V			1	μA
		V _{DS} =20V, V _{GS} =0V T _J =55°C			5	
Drain-Source On-Resistance	R _{DS(on)}	V _{GS} =10V, I _D =12A		0.031	0.040	Ω
		V _{GS} =4.5V, I _D =7A		0.035	0.045	
		V _{GS} =2.5V, I _D =4A		0.040	0.050	
		V _{GS} =1.8V, I _D =2A		0.048	0.060	
Forward Transconductance	g _{fs}	V _{DS} =5V, I _D =-3.6A		10		S
Diode Forward Voltage	V _{SD}	I _S =7A, V _{GS} =0V		0.95	1.2	V
Dynamic						
Total Gate Charge	Q _g	V _{DS} =10V, V _{GS} =4.5V I _D =12A		4.8	8	nC
Gate-Source Charge	Q _{gs}			1.0		
Gate-Drain Charge	Q _{gd}			1.0		
Input Capacitance	C _{iss}	V _{DS} =10V, V _{GS} =0V f=1MHz		485		pF
Output Capacitance	C _{oss}			85		
Reverse Transfer Capacitance	C _{rss}			40		
Turn-On Time	t _{d(on)}	V _{DD} =10V, R _L =6Ω I _D =1.0A, V _{GEN} =4.5V R _G =6Ω		8	14	ns
	t _r			12	18	
Turn-Off Time	t _{d(off)}			30	35	
	t _f			12	16	



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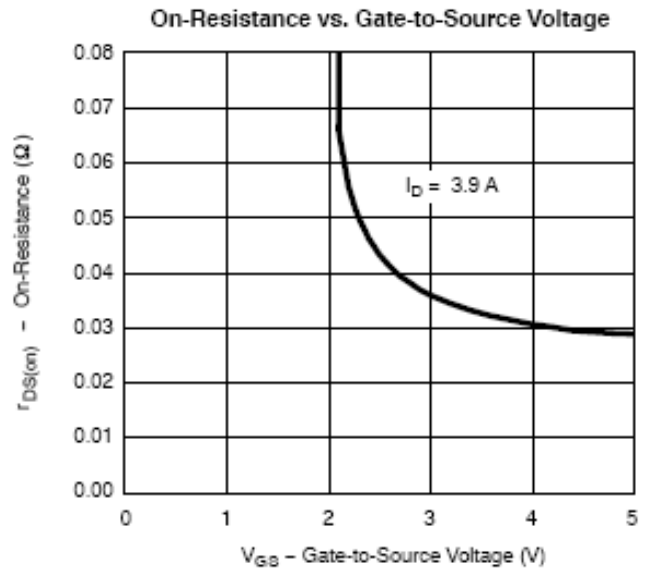
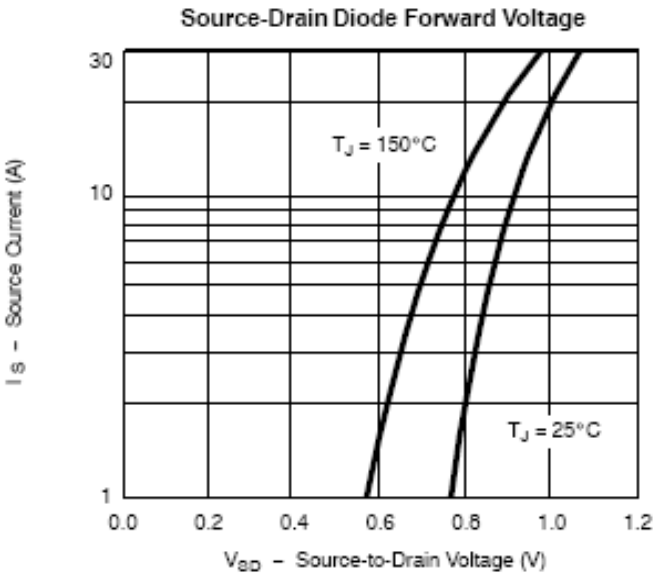
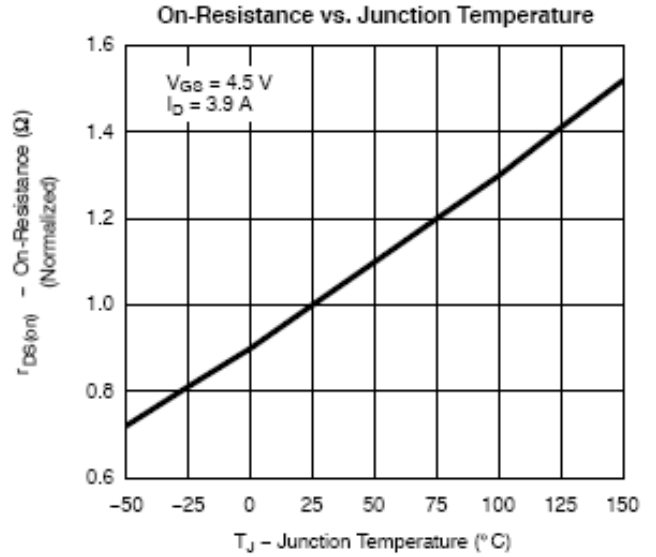
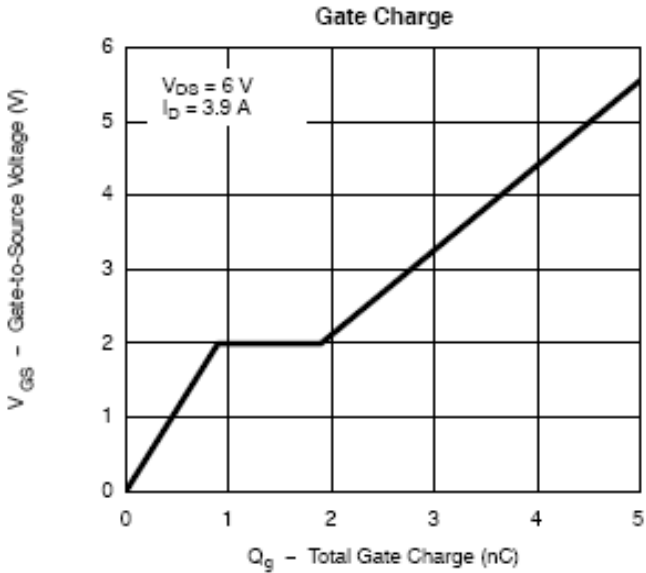
TYPICAL CHARACTERISTICS





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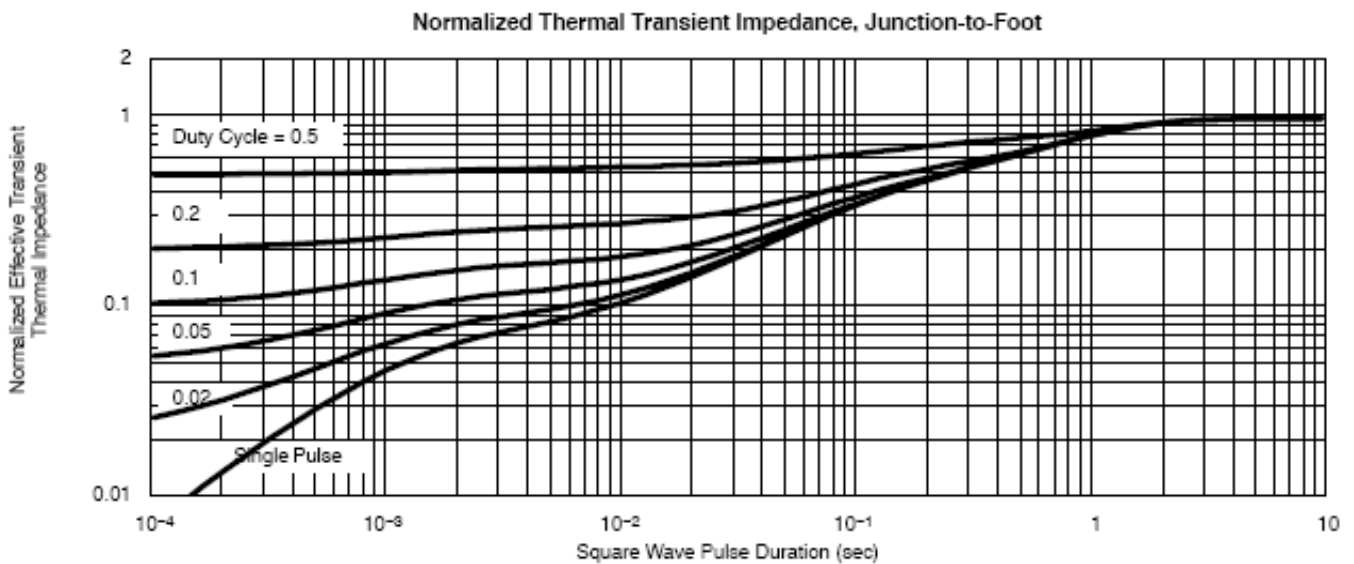
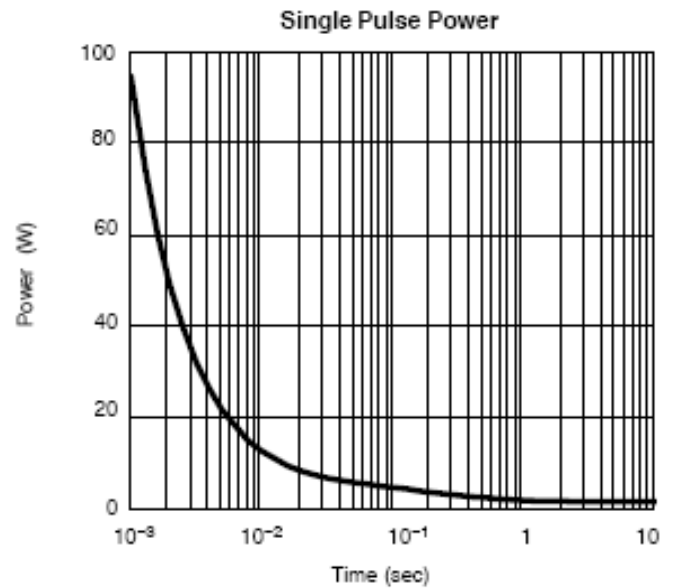
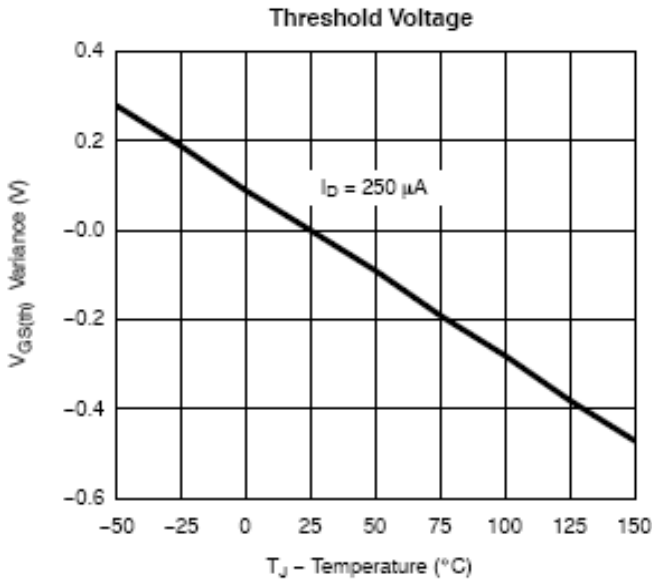
TYPICAL CHARACTERISTICS





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TYPICAL CHARACTERISTICS

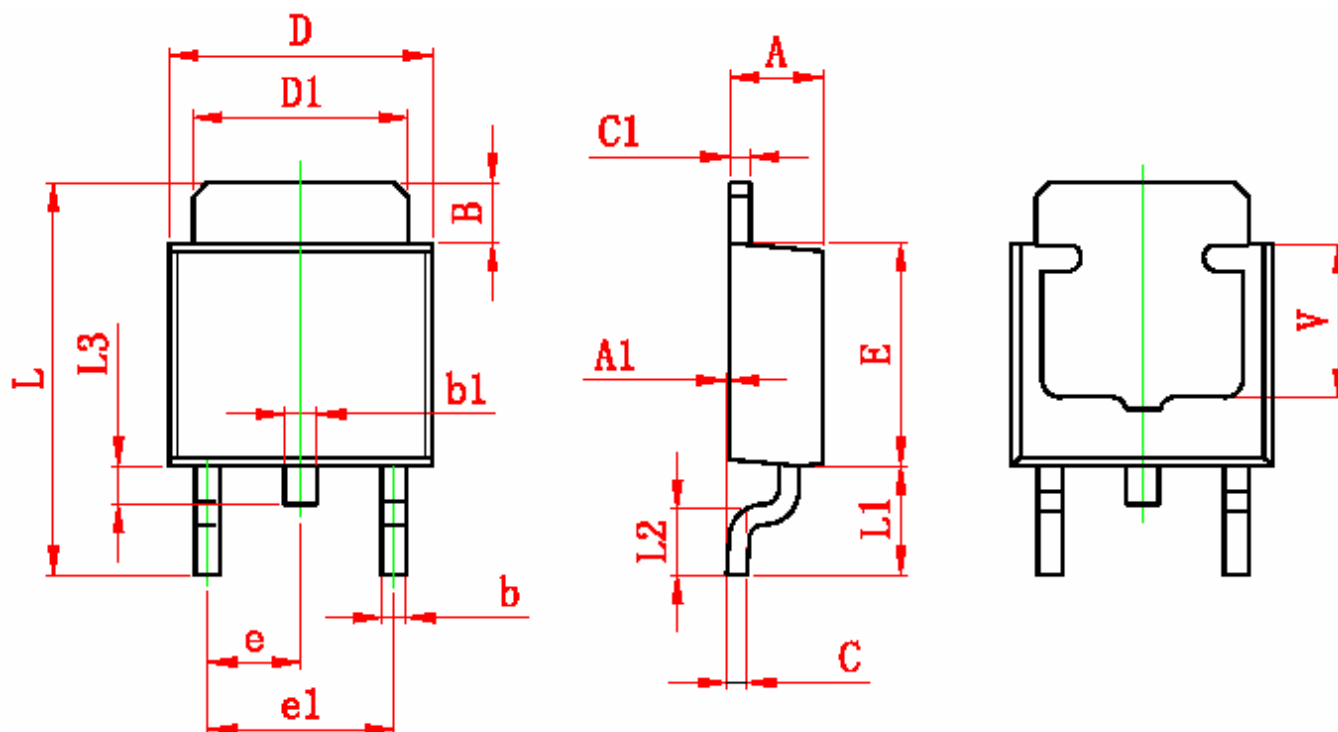




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TO-252-2L PACKAGE OUTLINE



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	2.200	2.400	0.087	0.094
A1	0.000	0.127	0.000	0.005
B	1.350	1.650	0.053	0.065
b	0.500	0.700	0.020	0.028
b1	0.700	0.900	0.028	0.035
c	0.430	0.580	0.017	0.023
c1	0.430	0.580	0.017	0.023
D	6.350	6.650	0.250	0.262
D1	5.200	5.400	0.205	0.213
E	5.400	5.700	0.213	0.224
e	2.300 TYP.		0.091 TYP.	
e1	4.500	4.700	0.177	0.185
L	9.500	9.900	0.374	0.390
L1	2.550	2.900	0.100	0.114
L2	1.400	1.780	0.055	0.070
L3	0.600	0.900	0.024	0.035
V	3.800 REF.		0.150 REF.	



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