



# SPN4546

## N-Channel Enhancement Mode MOSFET

### DESCRIPTION

The SPN4546 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 , notebook computer power management and other battery powered circuits where high-side switching .

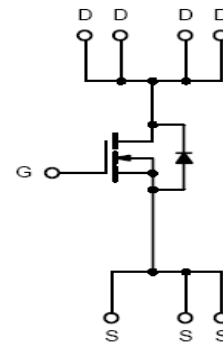
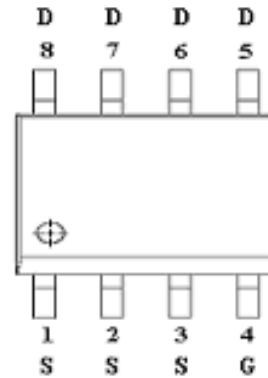
### FEATURES

- ◆ 40V/6.0A,  $R_{DS(ON)} = 48 \text{ m}\Omega @ V_{GS} = 10\text{V}$
- ◆ 40V/5.0A,  $R_{DS(ON)} = 55 \text{ m}\Omega @ V_{GS} = 4.5\text{V}$
- ◆ 40V/4.5A,  $R_{DS(ON)} = 80 \text{ m}\Omega @ V_{GS} = 2.5\text{V}$
- ◆ Super high density cell design for extremely low  $R_{DS(ON)}$
- ◆ Exceptional on-resistance and maximum DC current capability
- ◆ SOP – 8P package design

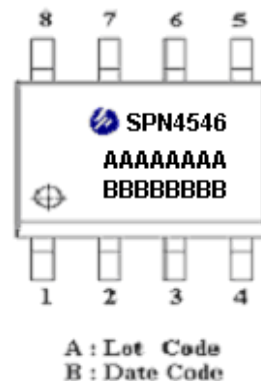
### APPLICATIONS

- Power Management in Note book
- Portable Equipment
- Battery Powered System
- DC/DC Converter
- Load Switch
- DSC
- LCD Display inverter

### PIN CONFIGURATION(SOP – 8P)



### PART MARKING





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### PIN DESCRIPTION

Pin	Symbol	Description
1	S	Source
2	S	Source
3	S	Source
4	G	Gate
5	D	Drain
6	D	Drain
7	D	Drain
8	D	Drain

### ORDERING INFORMATION

Part Number	Package	Part Marking
SPN4546S8RGB	SOP- 8P	SPN4546

※ SPN4546S8RGB 13" Tape Reel ; Pb – Free ; Halogen – Free

### ABSOLUTE MAXIMUM RATINGS

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

Parameter	Symbol	Typical	Unit	
Drain-Source Voltage	$V_{DSS}$	40	V	
Gate –Source Voltage	$V_{GSS}$	$\pm 12$	V	
Continuous Drain Current( $T_J=150^{\circ}\text{C}$ )	$I_D$	$T_A=25^{\circ}\text{C}$	6.0	A
		$T_A=70^{\circ}\text{C}$	5.0	
Pulsed Drain Current	$I_{DM}$	30	A	
Continuous Source Current(Diode Conduction)	$I_S$	2.3	A	
Power Dissipation	$P_D$	$T_A=25^{\circ}\text{C}$	2.5	W
		$T_A=70^{\circ}\text{C}$	1.6	
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	$R_{\theta JA}$	80	$^{\circ}\text{C}/\text{W}$	



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### ELECTRICAL CHARACTERISTICS

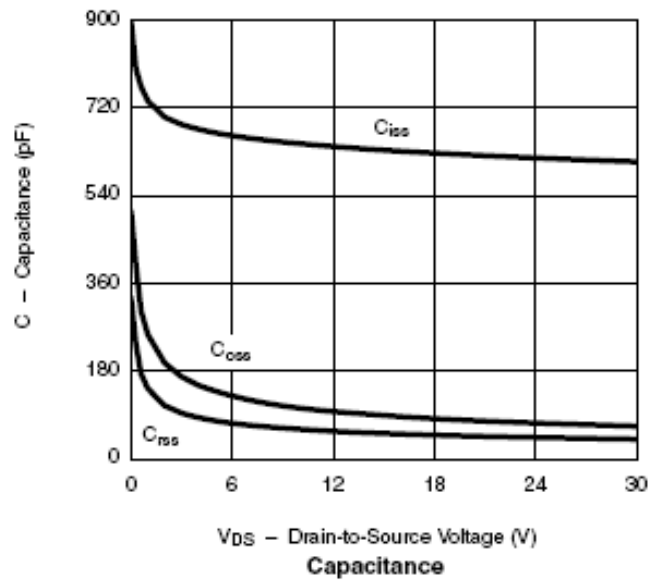
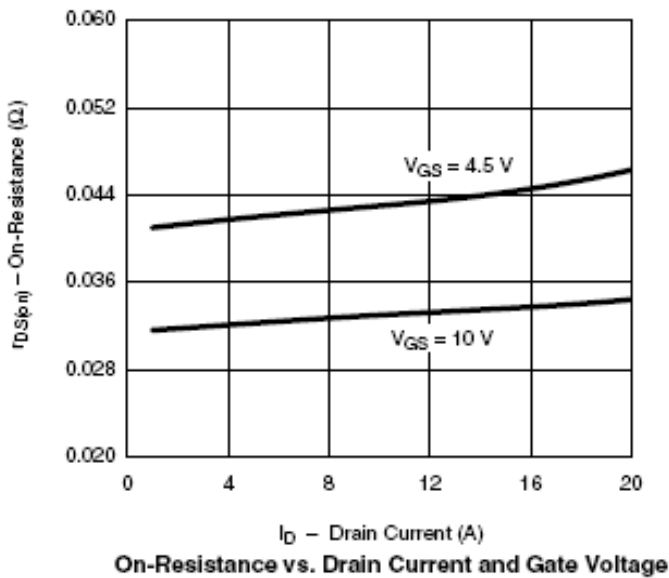
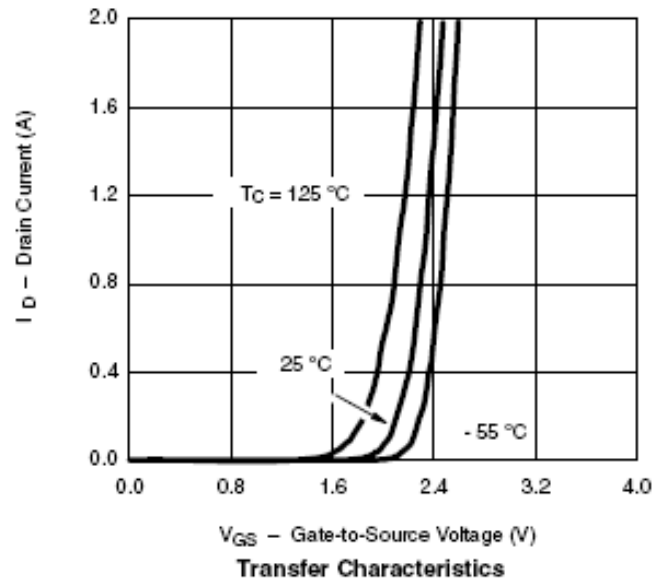
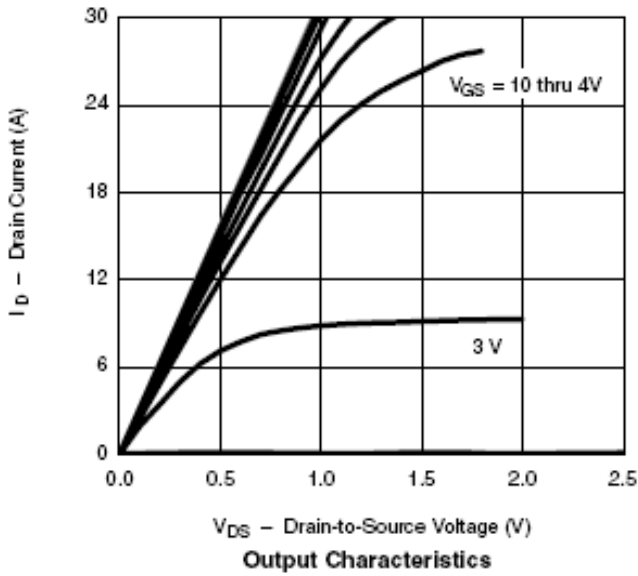
(T<sub>A</sub>=25°C Unless otherwise noted)

Parameter	Symbol	Conditions	Min.	Typ	Max.	Unit
<b>Static</b>						
Drain-Source Breakdown Voltage	V <sub>(BR)DSS</sub>	V <sub>GS</sub> =0V, I <sub>D</sub> =250μA	40			V
Gate Threshold Voltage	V <sub>GS(th)</sub>	V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> =250μA	0.5		1.0	
Gate Leakage Current	I <sub>GSS</sub>	V <sub>DS</sub> =0V, V <sub>GS</sub> =±12V			±100	nA
Zero Gate Voltage Drain Current	I <sub>DSS</sub>	V <sub>DS</sub> =40V, V <sub>GS</sub> =0V			1	μA
		V <sub>DS</sub> =40V, V <sub>GS</sub> =0V T <sub>J</sub> =85°C			5	
On-State Drain Current	I <sub>D(on)</sub>	V <sub>DS</sub> = 5V, V <sub>GS</sub> =4.5V	10			A
Drain-Source On-Resistance	R <sub>DSS(on)</sub>	V <sub>GS</sub> = 10V, I <sub>D</sub> =6.0A		0.040	0.048	Ω
		V <sub>GS</sub> =4.5V, I <sub>D</sub> =5.0A		0.047	0.055	
		V <sub>GS</sub> =2.5V, I <sub>D</sub> =4.5A		0.072	0.080	
Forward Transconductance	g <sub>fs</sub>	V <sub>DS</sub> =15V, I <sub>D</sub> =6.2A		13		S
Diode Forward Voltage	V <sub>SD</sub>	I <sub>S</sub> =2.3A, V <sub>GS</sub> =0V		0.8	1.2	V
<b>Dynamic</b>						
Total Gate Charge	Q <sub>g</sub>	V <sub>DS</sub> =15V, V <sub>GS</sub> =10V I <sub>D</sub> = 2A		10	15	nC
Gate-Source Charge	Q <sub>gs</sub>			1.6		
Gate-Drain Charge	Q <sub>gd</sub>			2.0		
Input Capacitance	C <sub>iss</sub>	V <sub>DS</sub> =20V, V <sub>GS</sub> =0V f=1MHz		500		pF
Output Capacitance	C <sub>oss</sub>			80		
Reverse Transfer Capacitance	C <sub>rss</sub>			45		
Turn-On Time	t <sub>d(on)</sub>	V <sub>DD</sub> =15V, R <sub>L</sub> =15Ω I <sub>D</sub> =1.0A, V <sub>GEN</sub> =10V R <sub>G</sub> =6Ω		15	20	nS
	t <sub>r</sub>			6	12	
Turn-Off Time	t <sub>d(off)</sub>			10	20	
	t <sub>f</sub>			40	80	



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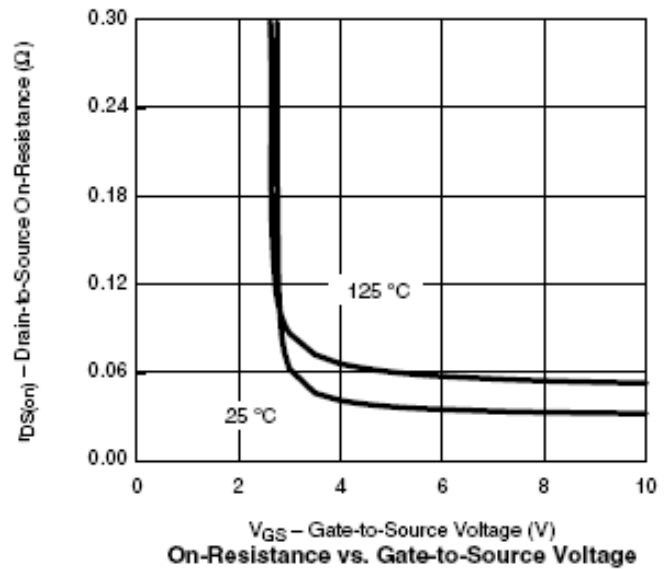
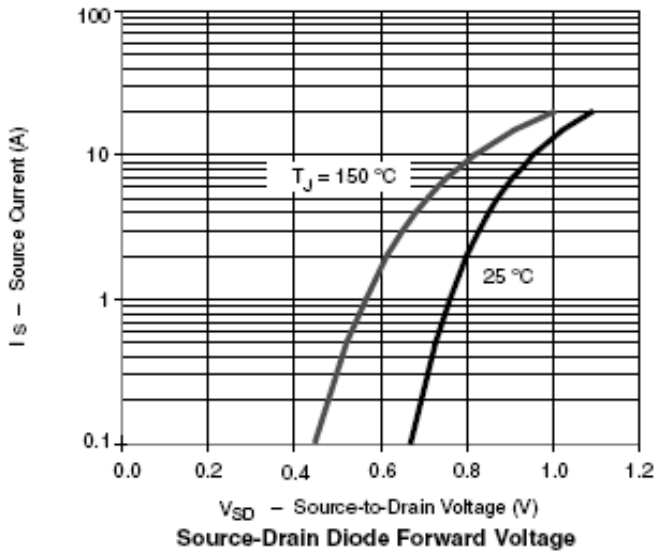
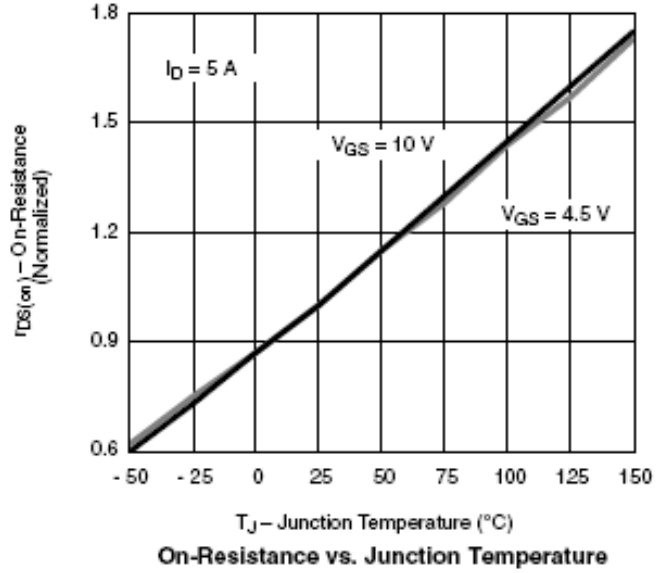
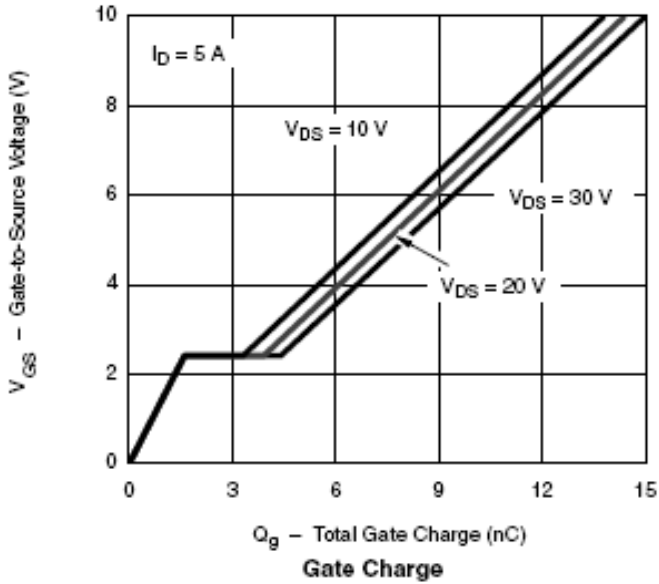
## TYPICAL CHARACTERISTICS





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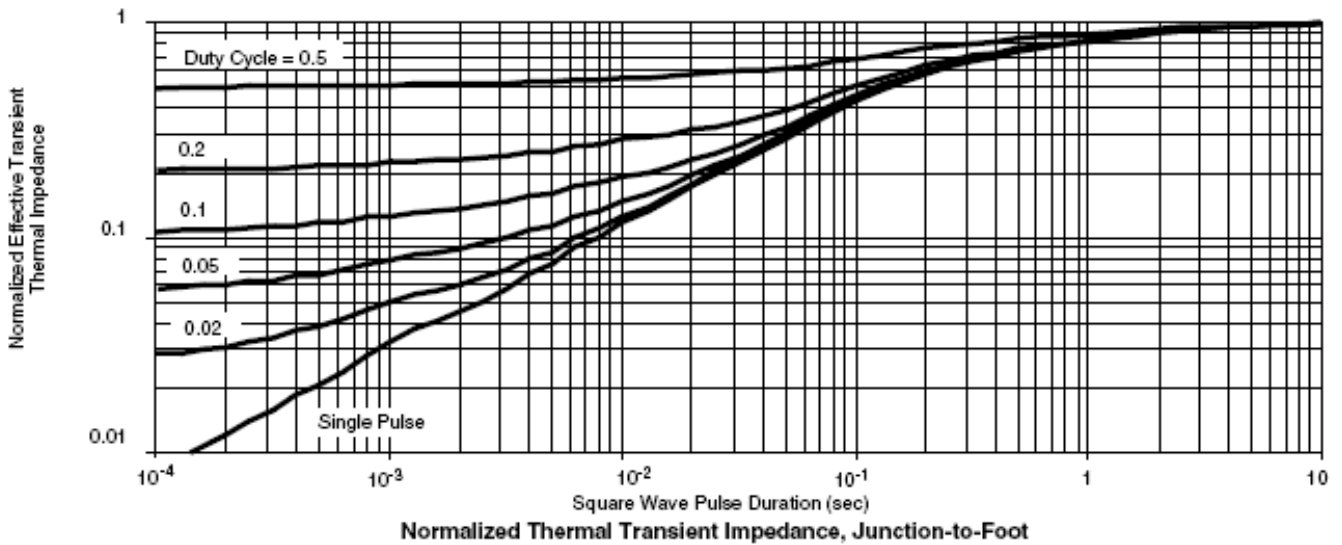
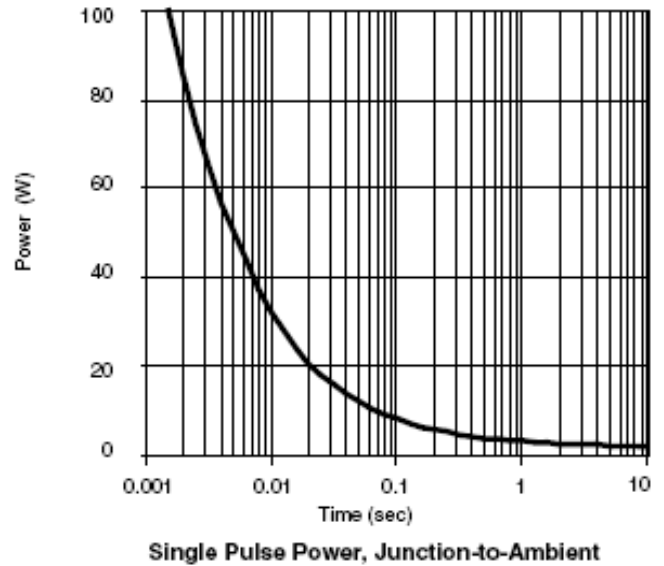
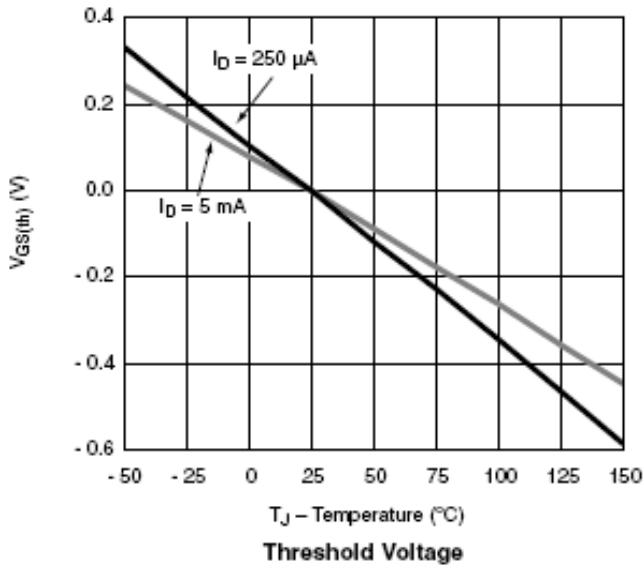
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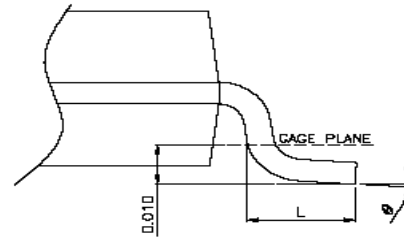
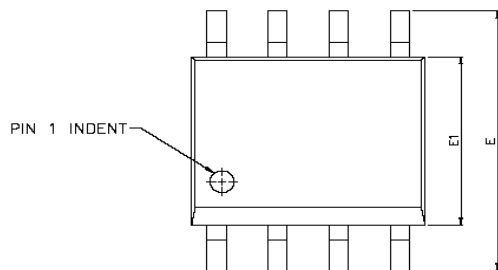
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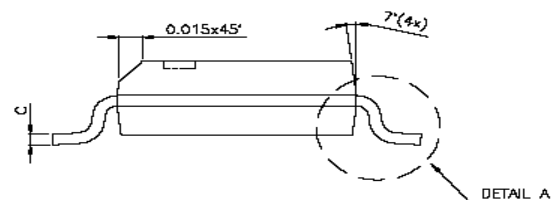
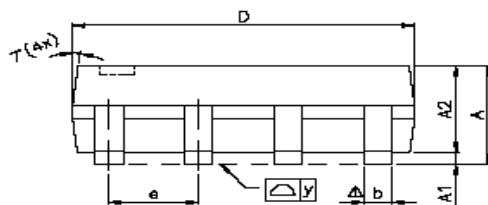


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## SOP- 8 PACKAGE OUTLINE



DETAIL A



DETAIL A

SYMBOLS	DIMENSIONS IN MILLIMETERS			DIMENSIONS IN INCHES		
	MIN	NOM	MAX	MIN	NOM	MAX
A	1.47	1.60	1.73	0.058	0.063	0.068
A1	0.10	—	0.25	0.004	—	0.010
A2	—	1.45	—	—	0.057	—
b	0.33	0.41	0.51	0.013	0.016	0.020
C	0.19	0.20	0.25	0.0075	0.008	0.0098
D	4.80	4.85	4.95	0.189	0.191	0.195
E	5.80	6.00	6.20	0.228	0.236	0.244
E1	3.80	3.90	4.00	0.150	0.154	0.157
e	—	1.27	—	—	0.050	—
L	0.38	0.71	1.27	0.015	0.028	0.050
$\Delta$ y	—	—	0.076	—	—	0.003
$\theta$	0°	—	8°	0°	—	8°



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