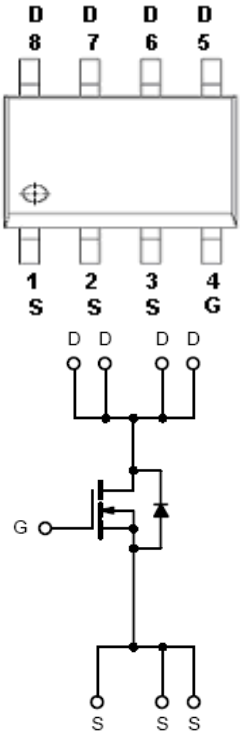
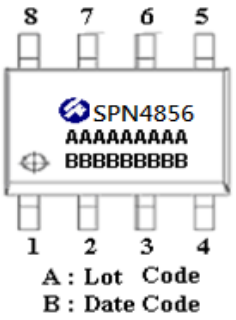
SPN4856
N-Channel Enhancement Mode MOSFET

DESCRIPTION
The SPN4856 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 .

APPLICATIONS
- DC/DC Converter
- Load Switch
- Synchronous Buck Converter
- Charger Adapter
- LED Lighting

FEATURES
- 45V/15A,$R_{DS(ON)}$=12mΩ@V_{GS}=10V
- 45V/15A,$R_{DS(ON)}$=15mΩ@V_{GS}=4.5V
- Super high density cell design for extremely low $R_{DS\ (ON)}$
- Exceptional on-resistance and maximum DC current capability
- SOP–8P package design

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
SPN4856S8RGB	SOP-8P	SPN4856

※ SPN4856S8RGB : 13" Tape Reel ; Pb – Free ; Halogen – Free

ABSOULTE MAXIMUM RATINGS

(T_A=25℃ Unless otherwise noted)

Parameter		Symbol	Typical	Unit
Drain-Source Voltage		V_{DSS}	45	V
Gate –Source Voltage		V_{GSS}	±20	V
Continuous Drain Current	T_A=25℃	I_D	15	A
	T_A=100℃		9.5	
Continuous Drain Current (Silicon Limited) T_A=25℃		I_D	35	A
Pulsed Drain Current		I_{DM}	60	A
Single Pulse Avalanche Energy		E_{AS}	38	mJ
Avalanche Current		I_{AS}	27	A
Power Dissipation	T_A=25℃	P_D	2.5	W
	T_A=70℃		1.4	
Operating Junction Temperature		T_J	-55/150	℃
Storage Temperature Range		T_{STG}	-55/150	℃
Thermal Resistance-Junction to Ambient		$R_{\theta JA}$	50	℃/W

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ELECTRICAL CHARACTERISTICS

(T_A=25℃ Unless otherwise noted)

Parameter	Symbol	Conditions	Min.	Typ	Max.	Unit
Static						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	V_{GS}=0V,I_D=250uA	45			V
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS}=V_{GS},I_D=250uA	0.8		1.8	
Gate Leakage Current	I_{GSS}	V_{DS}=0V,V_{GS}=±20V			±100	nA
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS}=36V,V_{GS}=0V, T_J=25℃			1	uA
Drain-Source On-Resistance	$R_{DS(on)}$	V_{GS}=10V,I_D=1A			12	mΩ
		V_{GS}=4.5V,I_D=1A			15	
Forward Transconductance	gfs	V_{DS}=5V,I_D=6A		25		S
Diode Forward Voltage	V_{SD}	I_S=1A,V_{GS}=0V	0.4		1.0	V
Dynamic						
Total Gate Charge	Q_g	V_{DS}=20V, V_{GS}=10V I_D=13.3A		31.5		nC
Gate-Source Charge	Q_{gs}			3.5		
Gate-Drain Charge	Q_{gd}			9		
Input Capacitance	C_{iss}	V_{DS}=25V, V_{GS}=0V f=1MHz		1600		pF
Output Capacitance	C_{oss}			180		
Reverse Transfer Capacitance	C_{rss}			130		
Turn-On Time	$t_{d(on)}$	V_{DD}=20V, I_D=13.3A,V_{GS}=10V R_G=6Ω		12		nS
	t_r			82		
Turn-Off Time	$t_{d(off)}$			33		
	t_f			59		
Gate resistance	R_g	V_{GS}=0V,V_{DS}=0V, f=1MHz		1.2		Ω

Note :

1. Repetitive Rating : Pulsed width limited by maximum junction temperature.
2. V_{DD}=50V, V_{GS}=10V, L=0.1mH , I_{AS}=27A , R_G=25Ω , Starting T_J=25℃
3. The data tested by pulsed, pulse width ≦300us, duty cycle ≦2%.
4. Essentially independent of operating temperature.

TYPICAL CHARACTERISTICS

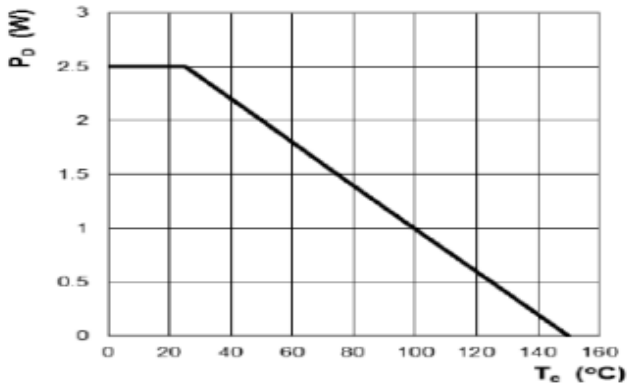


Figure 1: Power Dissipation

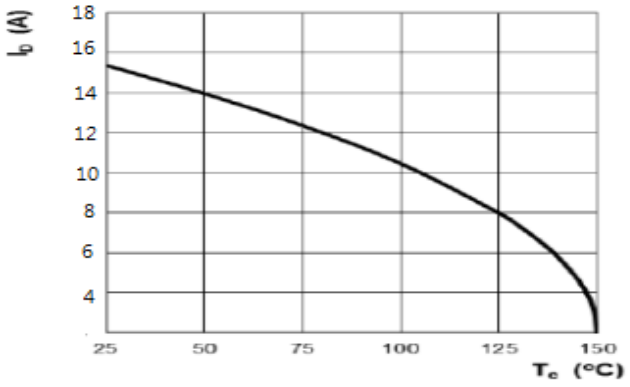


Figure 2: Continuous Drain Current vs. T_C

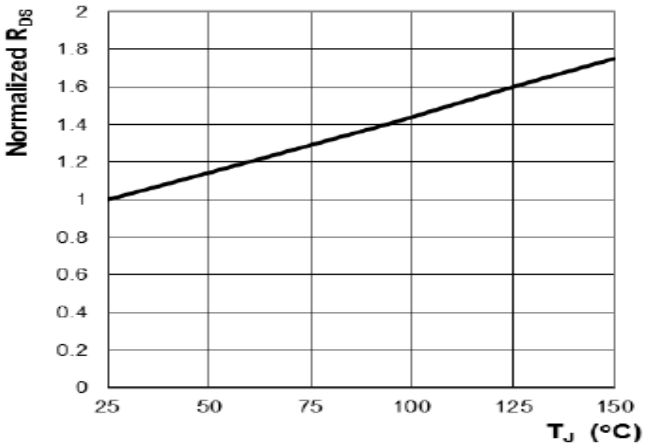


Figure 3: Normalized $R_{DS(ON)}$ vs. T_J

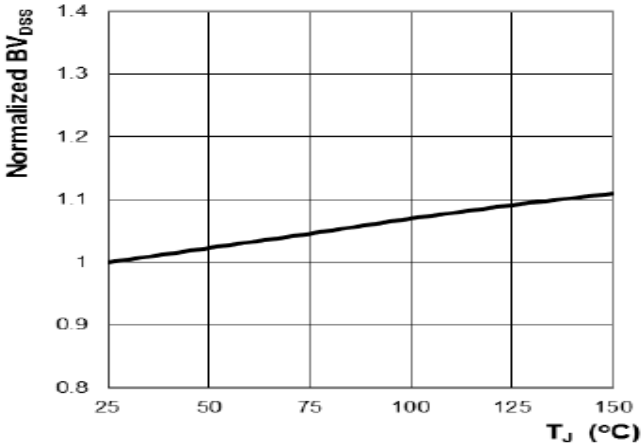


Figure 4: Normalized BV_{DSS} vs. T_J

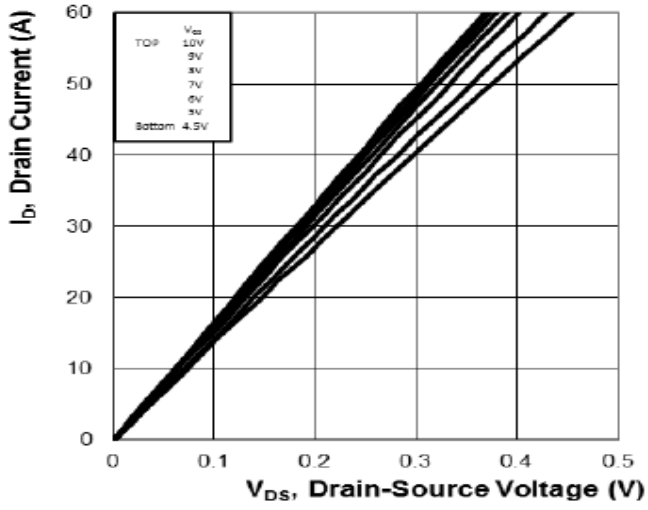


Figure 5: On-Region Characteristics

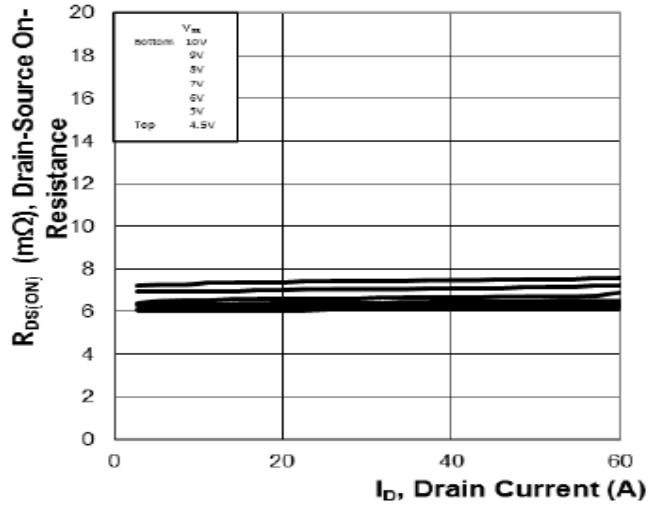


Figure 6: Typ. R_{DS} Variation vs. I_D and V_{GS}

TYPICAL CHARACTERISTICS

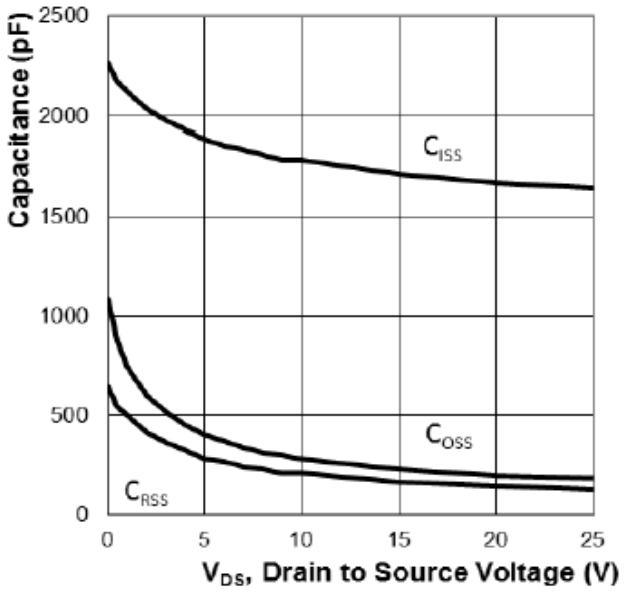


Figure 7: Typ. Capacitance Characteristics

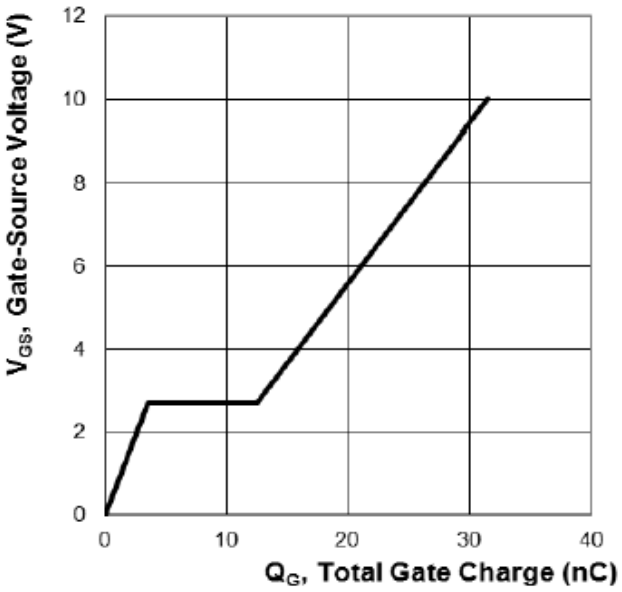


Figure 8: Typ. Gate Charge Characteristics

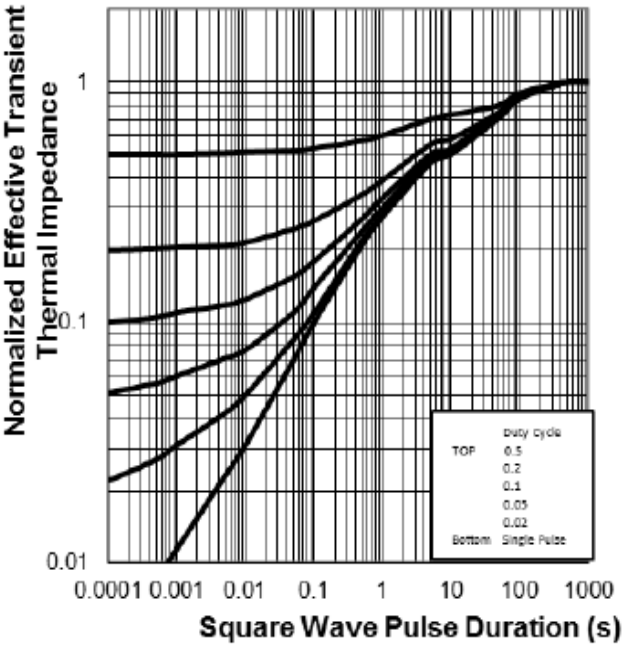


Figure 9: Normalized Thermal Transient Impedance, Junction-to-Case

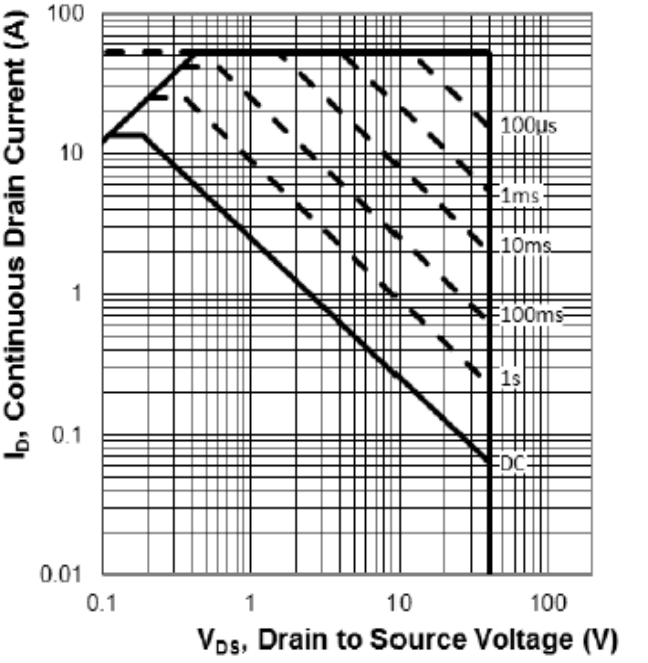
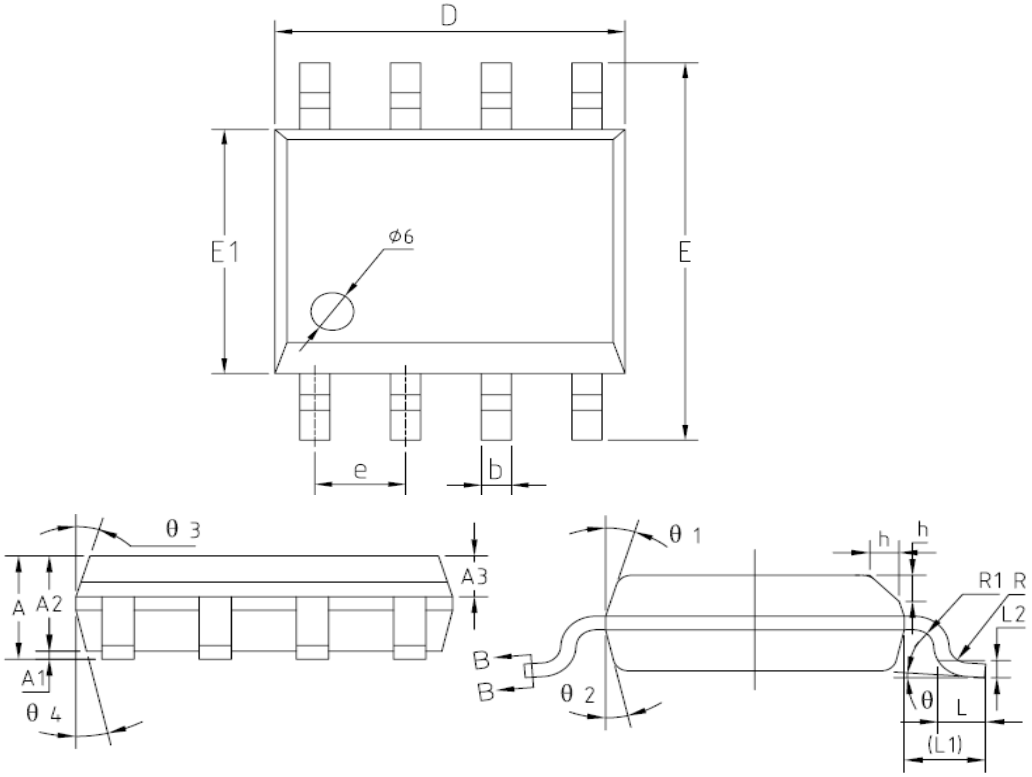


Figure 10: Maximum Safe Operation Area

SOP- 8 PACKAGE OUTLINE



SYMBOL	MIN	NOM	MAX
A	1.35	--	1.75
A1	0.10	--	0.25
A2	1.25	1.40	1.65
A3	0.50	0.60	0.70
b	0.33	-	0.51
c	0.17	--	0.25
D	4.80	4.93	5.05
E	5.80	6.00	6.20
E1	3.80	3.90	4.00
e	1.17	1.27	1.37
L	0.45	0.60	0.80
L1	1.04 REF		
L2	0.25BSC		
R	0.07	--	--
R1	0.07	--	0.20
h	0.25	--	0.50
θ	0°	--	8°
θ 1	15°	17°	19°
θ 2	11°	13°	15°
θ 3	15°	17°	19°
θ 4	11°	13°	15°

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