



# SPP8845

## P-Channel Enhancement Mode MOSFET

### DESCRIPTION

The SPP8845 is the P-Channel logic enhancement mode power field effect transistors are produced using high cell density, DMOS trench technology. The SPP8845 has been designed specifically to improve the overall efficiency of DC/DC converters using either synchronous or conventional switching PWM controllers. It has been optimized for low gate charge, low  $R_{DS(ON)}$  and fast switching speed.

### FEATURES

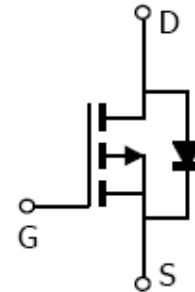
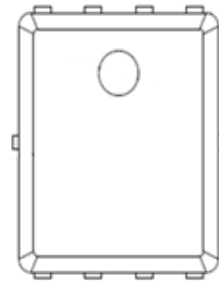
- ◆ -40V/-25A,  $R_{DS(ON)}=5.8m\Omega@V_{GS}=-10V$
- ◆ -40V/-12A,  $R_{DS(ON)}=8.5m\Omega@V_{GS}=-4.5V$
- ◆ Super high density cell design for extremely low  $R_{DS(ON)}$
- ◆ Exceptional on-resistance and maximum DC current capability
- ◆ PPAK5x6-8L package design

### APPLICATIONS

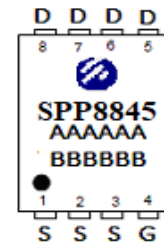
- High Frequency Synchronous Buck Converter
- DC/DC Power System
- Load Switch

### PIN CONFIGURATION

#### PPAK5x6-8L



### PART MARKING



A : Lot Code  
 B : Date Code  
 (YY/MM/DD)



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### PPAK5X6 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
SPP8845DN8RGB	PPAK5x6-8L	SPP8845

※ SPP8845DN8RGB : 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	$V_{GSS}$	$\pm 20$	V	
Continuous Drain Current	$I_D$	$T_A=25^{\circ}\text{C}$	-85	A
		$T_A=100^{\circ}\text{C}$	-54	
Pulsed Drain Current	$I_{DM}$	-340	A	
Avalanche Current	$I_{AS}$	-70	A	
Single Pulse Avalanche Energy ( $L=0.1\text{mH}$ , $T_c=25^{\circ}\text{C}$ )	$E_{AS}$	245	mJ	
Power Dissipation	$P_D$	$T_c=25^{\circ}\text{C}$ 135	W	
Operating Junction Temperature	$T_J$	150	$^{\circ}\text{C}$	
Storage Temperature Range	$T_{STG}$	-55/150	$^{\circ}\text{C}$	
Thermal Resistance-Junction to Case	$R_{\theta JC}$	0.92	$^{\circ}\text{C}/\text{W}$	



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### ELECTRICAL CHARACTERISTICS

(TA=25°C Unless otherwise noted)

Parameter	Symbol	Conditions	Min.	Typ	Max.	Unit
<b>Static</b>						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	$V_{GS}=0V, I_D=-250\mu A$	-40			V
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=-250\mu A$	-1.2		-2.5	V
Gate Leakage Current	$I_{GSS}$	$V_{DS}=0V, V_{GS}=\pm 20V$			$\pm 100$	nA
Zero Gate Voltage Drain Current	$I_{DSS}$	$V_{DS}=-32V, V_{GS}=0V$			-1	uA
		$V_{DS}=-32V, V_{GS}=0V, T_J=125^\circ C$			-10	
Gate Resistance	$R_g$	$V_{DS}=0V, V_{GS}=0V, f=1MHz$		4.2	6.3	$\Omega$
Drain-Source On-Resistance	$R_{DS(on)}$	$V_{GS}=-10V, I_D=-25A$		4.7	5.8	m $\Omega$
		$V_{GS}=-4.5V, I_D=-12A$		6.4	8.5	
Forward Transconductance	$g_{fs}$	$V_{DS}=-10V, I_D=-3A$		15		S
Diode Forward Voltage	$V_{SD}$	$I_S=-1A, V_{GS}=0V$			-1	V
<b>Dynamic</b>						
Total Gate Charge	$Q_g$	$V_{DS}=-32V, V_{GS}=-10V$ $I_D=-10A$		106	160	nC
Gate-Source Charge	$Q_{gs}$			13.1	20	
Gate-Drain Charge	$Q_{gd}$			24.9	38	
Input Capacitance	$C_{iss}$	$V_{DS}=-25V, V_{GS}=0V$ $f=1MHz$		5720	8580	pF
Output Capacitance	$C_{oss}$			527	790	
Reverse Transfer Capacitance	$C_{rss}$			352	528	
Turn-On Time	$t_{d(on)}$	$V_{DD}=-32V,$ $I_D=-1A, V_{GS}=-10V, R_G=6\Omega$		41.6	82	nS
	$t_r$			12.7	26	
Turn-Off Time	$t_{d(off)}$			308	600	
	$t_f$			70	140	



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## TYPICAL CHARACTERISTICS

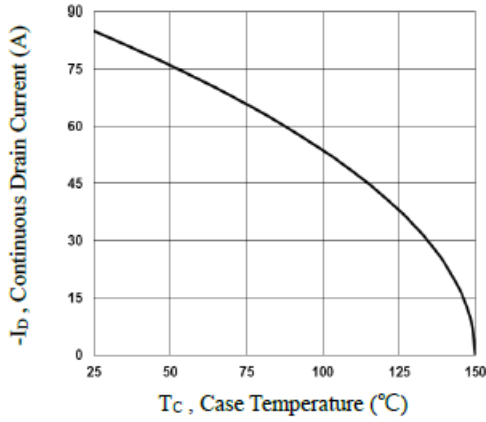


Fig.1 Continuous Drain Current vs.  $T_C$

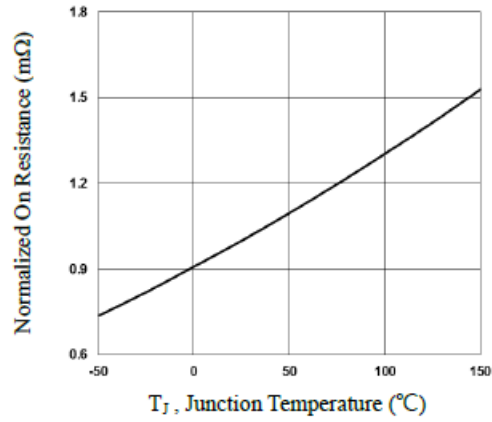


Fig.2 Normalized  $R_{DS(on)}$  vs.  $T_J$

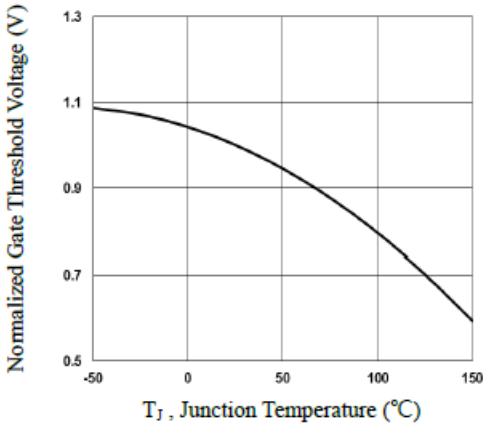


Fig.3 Normalized  $V_{th}$  vs.  $T_J$

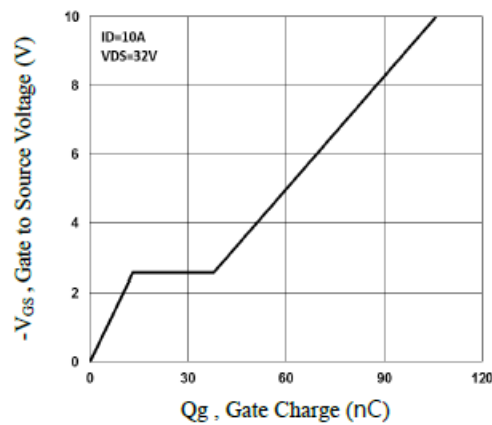


Fig.4 Gate Charge Waveform

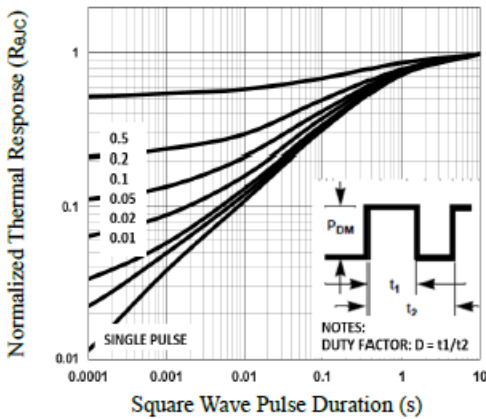


Fig.5 Normalized Transient Impedance

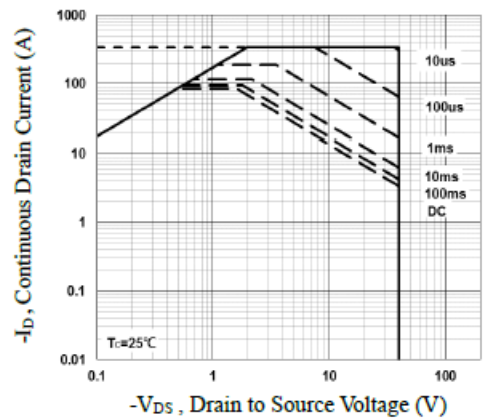


Fig.6 Maximum Safe Operation Area



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### TYPICAL CHARACTERISTICS

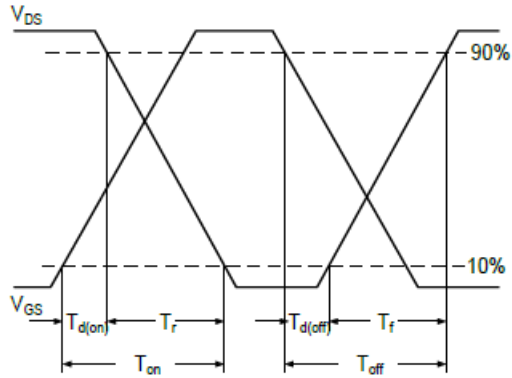


Fig.7 Switching Time Waveform

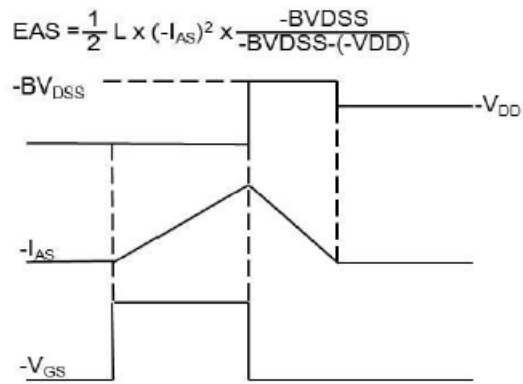


Fig.8 EAS Waveform



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