



SPP1413A

P-Channel Enhancement Mode MOSFET

DESCRIPTION

The SPP1413A is the P-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 cellular phone and notebook computer power management and other battery powered circuits where high-side switching , and low in-line power loss are needed in a very small outline surface mount package.

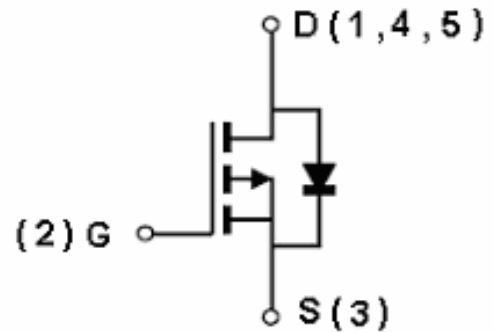
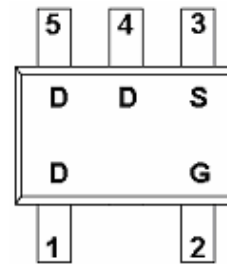
FEATURES

- ◆ -20V/-3.4A, $R_{DS(ON)}=130m\Omega@V_{GS}=-4.5V$
- ◆ -20V/-2.4A, $R_{DS(ON)}=150m\Omega@V_{GS}=-2.5V$
- ◆ -20V/-1.7A, $R_{DS(ON)}=190m\Omega@V_{GS}=-1.8V$
- ◆ Super high density cell design for extremely low $R_{DS(ON)}$
- ◆ Exceptional on-resistance and maximum DC current capability
- ◆ SOT-353 (SC-70) package design

APPLICATIONS

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

PIN CONFIGURATION (SOT-353 ; SC-70)



PART MARKING



Y : Year Code
W : Week Code



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PIN DESCRIPTION

Pin	Symbol	Description
2	G	Gate
3	S	Source
1, 4, 5	D	Drain

ORDERING INFORMATION

Part Number	Package	Part Marking
SPP1413AS35RG	SOT-353	1AYW

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

SPP1413AS35RG : Tape Reel ; Pb – Free

ABSOLUTE MAXIMUM RATINGS

($T_A=25$ Unless otherwise noted)

Parameter	Symbol	Typical	Unit	
Drain-Source Voltage	V_{DSS}	-20	V	
Gate –Source Voltage	V_{GSS}	± 12	V	
Continuous Drain Current($T_J=150$)	I_D	$T_A=25$	-2.3	A
		$T_A=70$	-1.7	
Pulsed Drain Current	I_{DM}	-6	A	
Continuous Source Current(Diode Conduction)	I_S	-1.4	A	
Power Dissipation	P_D	$T_A=25$	0.95	W
		$T_A=70$	0.51	
Operating Junction Temperature	T_J	-55/150		
Storage Temperature Range	T_{STG}	-55/150		
Thermal Resistance-Junction to Ambient	$R_{\theta JA}$	105	/W	



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ELECTRICAL CHARACTERISTICS

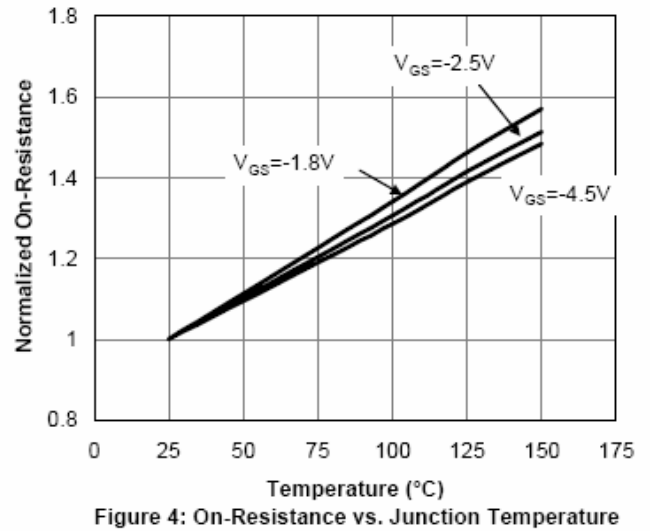
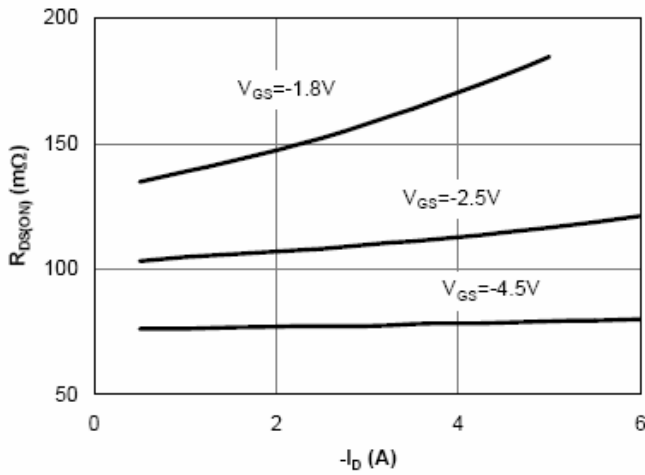
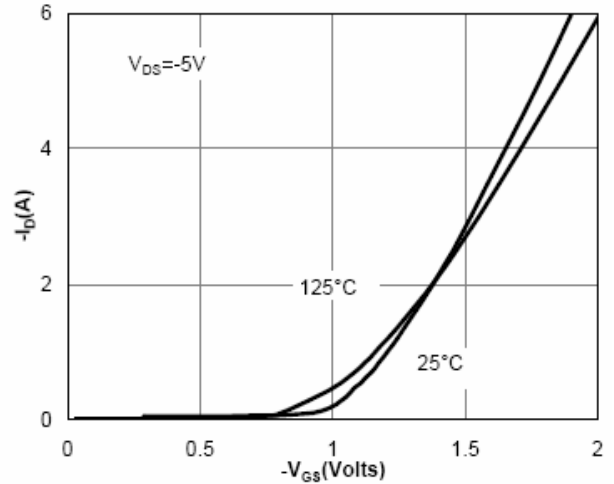
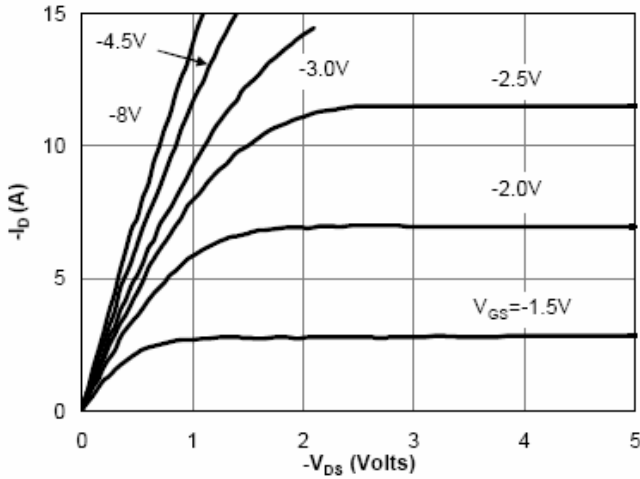
($T_A=25$ Unless otherwise noted)

Parameter	Symbol	Conditions	Min.	Typ	Max.	Unit
Static						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	$V_{GS}=0V, I_D=-250\mu A$	-20			V
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=-250\mu A$	-0.35		-0.8	
Gate Leakage Current	I_{GSS}	$V_{DS}=0V, V_{GS}=\pm 12V$			± 100	nA
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS}=-20V, V_{GS}=0V$			-1	uA
		$V_{DS}=-20V, V_{GS}=0V$ $T_J=55$			-5	
On-State Drain Current	$I_{D(on)}$	$V_{DS} = -5V, V_{GS}=-4.5V$	-6			A
Drain-Source On-Resistance	$R_{DS(on)}$	$V_{GS}=-4.5V, I_D=-3.4A$		0.110	0.130	Ω
		$V_{GS}=-2.5V, I_D=-2.4A$		0.130	0.150	
		$V_{GS}=-1.8V, I_D=-1.7A$		0.170	0.190	
Forward Transconductance	g_{fs}	$V_{DS}=-5V, I_D=-2.8A$		6		S
Diode Forward Voltage	V_{SD}	$I_S=-1.5A, V_{GS}=0V$		-0.8	-1.2	V
Dynamic						
Total Gate Charge	Q_g	$V_{DS}=-6V, V_{GS}=-4.5V$ $I_D=-2.8A$		4.8	8	nC
Gate-Source Charge	Q_{gs}			1.0		
Gate-Drain Charge	Q_{gd}			1.0		
Input Capacitance	C_{iss}	$V_{DS}=-6V, V_{GS}=0V$ $f=1MHz$		485		pF
Output Capacitance	C_{oss}			85		
Reverse Transfer Capacitance	C_{rss}			40		
Turn-On Time	$t_{d(on)}$	$V_{DD}=-6V, R_L=6\Omega$ $I_D=-1.0A, V_{GEN}=-4.5V$ $R_G=6\Omega$		10	16	ns
	t_r			13	23	
Turn-Off Time	$t_{d(off)}$			18	25	
	t_f			15	20	



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TYPICAL CHARACTERISTICS





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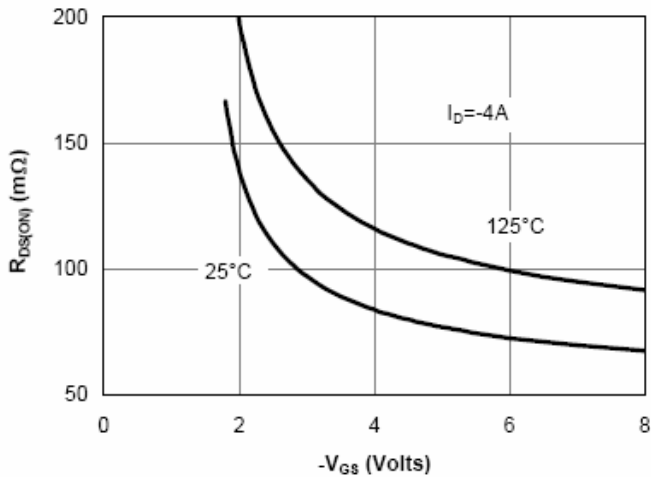


Figure 5: On-Resistance vs. Gate-Source Voltage

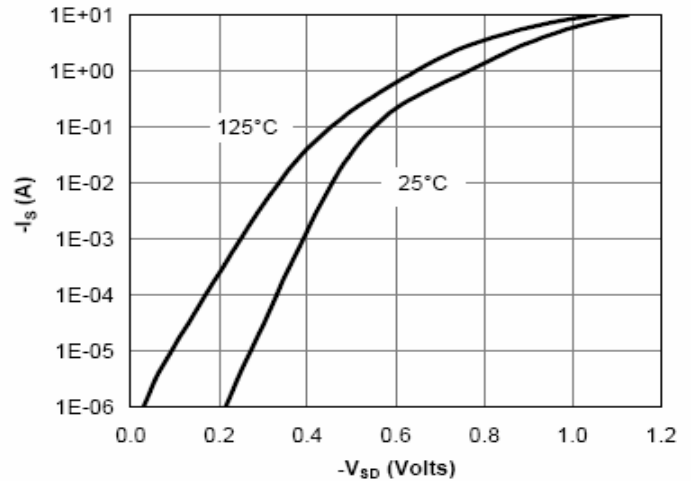


Figure 6: Body-Diode Characteristics

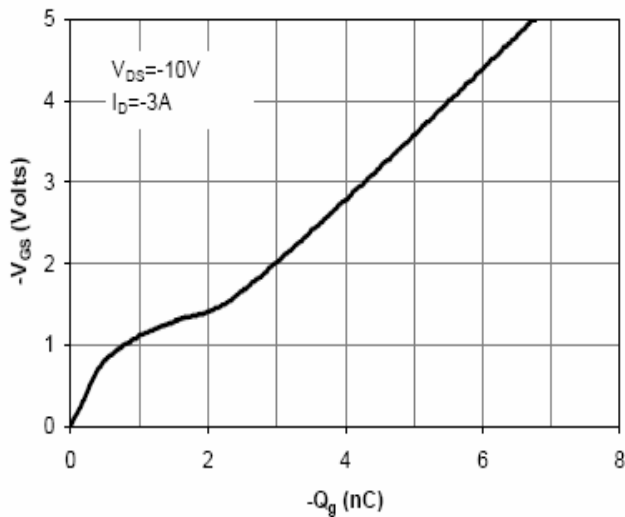


Figure 7: Gate-Charge Characteristics

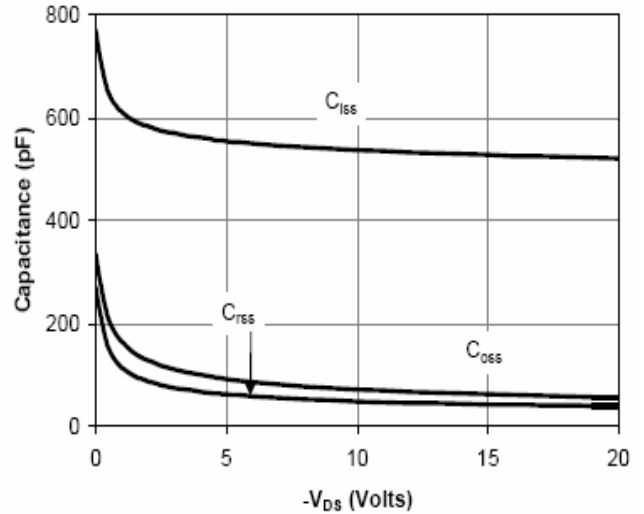


Figure 8: Capacitance Characteristics



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TYPICAL CHARACTERISTICS

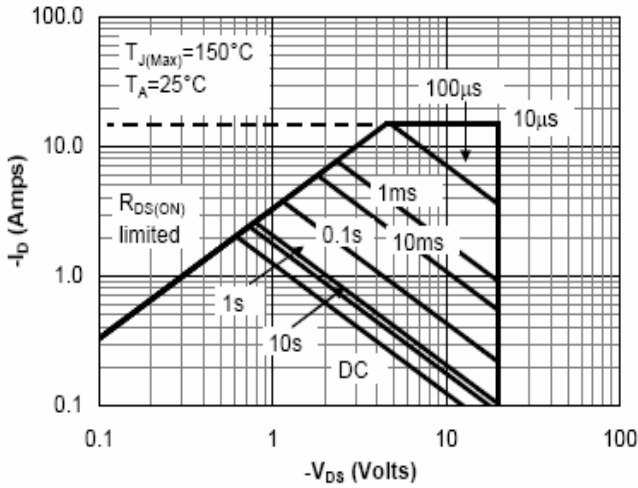


Figure 9: Maximum Forward Biased Safe Operating Area (Note E)

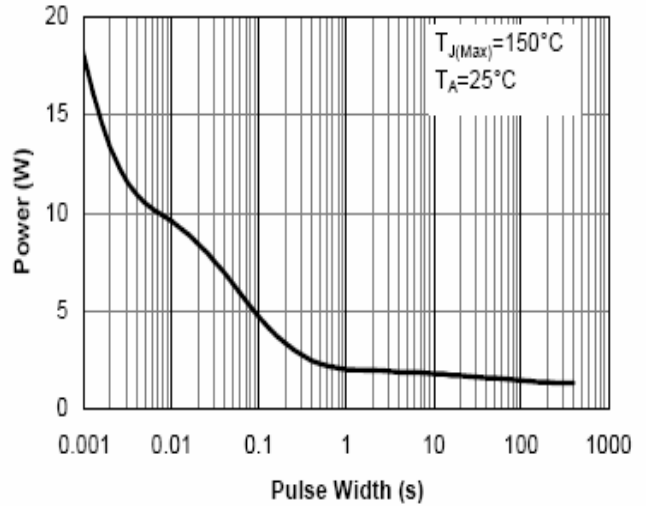


Figure 10: Single Pulse Power Rating Junction-to-Ambient (Note E)

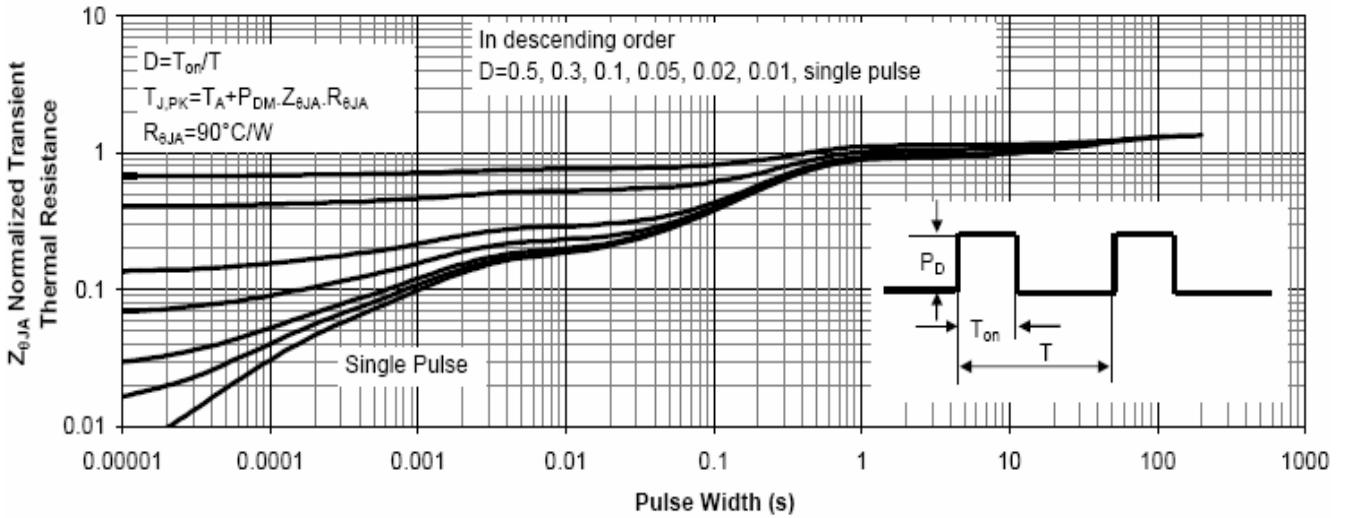


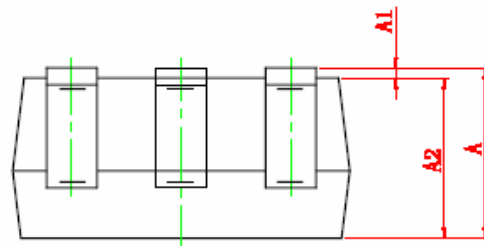
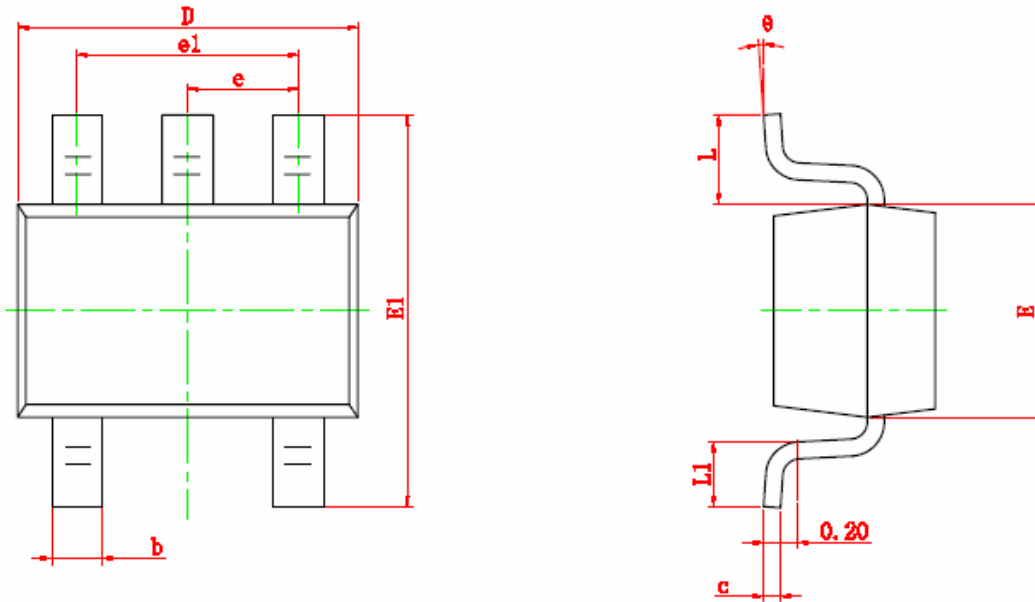
Figure 11: Normalized Maximum Transient Thermal Impedance



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SOT-353 PACKAGE OUTLINE



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	0.900	1.100	0.035	0.043
A1	0.000	0.100	0.000	0.004
A2	0.900	1.000	0.035	0.039
b	0.150	0.350	0.006	0.014
c	0.080	0.150	0.003	0.006
D	2.000	2.200	0.079	0.087
E	1.150	1.350	0.045	0.053
E1	2.150	2.450	0.085	0.096
e	0.650 TYP		0.026 TYP	
e1	1.200	1.400	0.047	0.055
L	0.525 REF		0.021 REF	
L1	0.260	0.460	0.010	0.018
θ	0°	8°	0°	8°



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