P Channel Enhancement Mode MOSFET **ST1413AC**

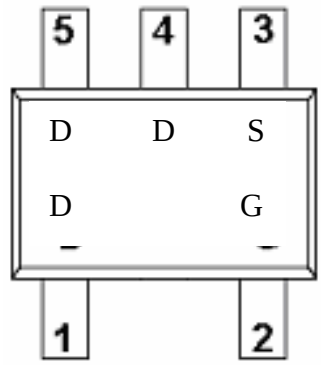
-3.4A

DESCRIPTION

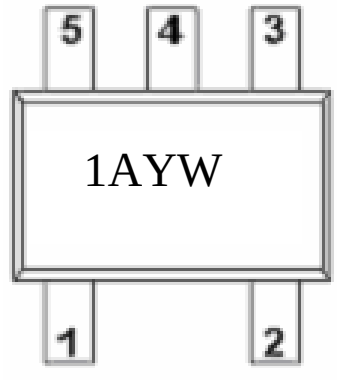
The ST1413AC is the P-Channel logic enhancement mode power field effect transistors. It is produced using high cell density, DMOS trench technology. This high density process is especially tailored to minimize on-state resistance.

These devices are particularly suited for low voltage application such as cellular phone, 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.

PIN CONFIGURATION
SOD-353 (SC-70)



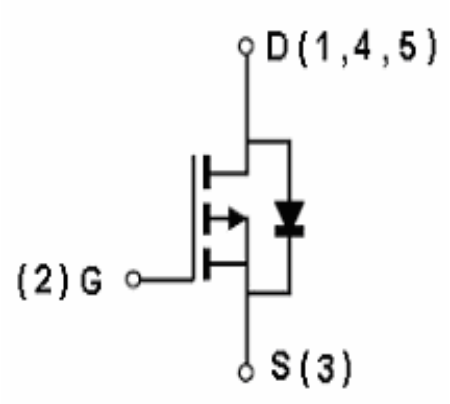
1.4.5.Drain 2.Gate 3.Source



1A : Part Marking
Y : Year Code
W : Week Code

FEATURE

- -20V/-3.4A, $R_{DS(ON)}$ = 130m-ohm @VGS = -4.5V
- -20V/-2.4A, $R_{DS(ON)}$ = 150m-ohm @VGS = -2.5V
- -20V/-1.7A, $R_{DS(ON)}$ = 190m-ohm @VGS = -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



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120 Bentley Square, Mountain View, Ca 94040 USA
TEL: (650) 9389294 FAX: (650) 9389295

ABSOULTE MAXIMUM RATINGS (Ta = 25°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°C)	T_A=25°C T_A=70°C	I_D	-2.8 -2.0	A
Pulsed Drain Current		I_{DM}	-8	A
Continuous Source Current (Diode Conduction)		I_S	-1.4	A
Power Dissipation	T_A=25°C T_A=70°C	P_D	0.33 0.21	W
Operation Junction Temperature		T_J	150	°C
Storgae Temperature Range		T_{STG}	-55/150	°C
Thermal Resistance-Junction to Ambient		$R_{\theta JA}$	105	°C/W

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ELECTRICAL CHARACTERISTICS (Ta = 25°C Unless otherwise noted)

Parameter	Symbol	Condition	Min	Typ	Max	Unit
Static						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	V_{GS}=0V,I_D=-250uA	-20			V
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS}=V_{GS},I_D=-250uA	-0.4		-1.0	V
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	uA
		V_{DS}=-20V,V_{GS}=0V T_J=55°C			-5	
On-State Drain Current	$I_{D(on)}$	V_{DS}≦-5V,V_{GS}=-4.5V	-6.0			A
Drain-source On-Resistance	$R_{DS(on)}$	V_{GS}=-4.5V,I_D=-2.8A V_{GS}=-2.5V,I_D=-2.0A V_{GS}=-1.8V,I_D=-1.5A		0.110 0.130 0.170	0.130 0.150 0.190	Ω
Forward Transconductance	g_{fs}	V_{DS}=-5V,I_D=-2.8V		6		S
Diode Forward Voltage	V_{SD}	I_S=-1.6A,V_{GS}=0V		-0.8	-1.2	V
Dynamic						
Total Gate Charge	Qg	V_{DS}=-6V,V_{GS}=-4.5V I_D≡-2.8A		4.8	8	nC
Gate-Source Charge	Qgs			1.0		
Gate-Drain Charge	Qgd			1.0		
Input Capacitance	Ciss	V_{DS}=-6V,V_{GS}=0V F=1MHz		485		pF
Output Capacitance	Coss			85		
Reverse Transfer Capacitance	Crss			40		
Turn-On Time	$t_{d(on)}$	V_{DD}=-6V,R_L=6Ω I_D=-1A,V_{GEN}=-4.5V R_G=6Ω		10	25	nS
	t_r			13	60	
Turn-Off Time	$t_{d(off)}$			18	70	
	t_f			15	60	

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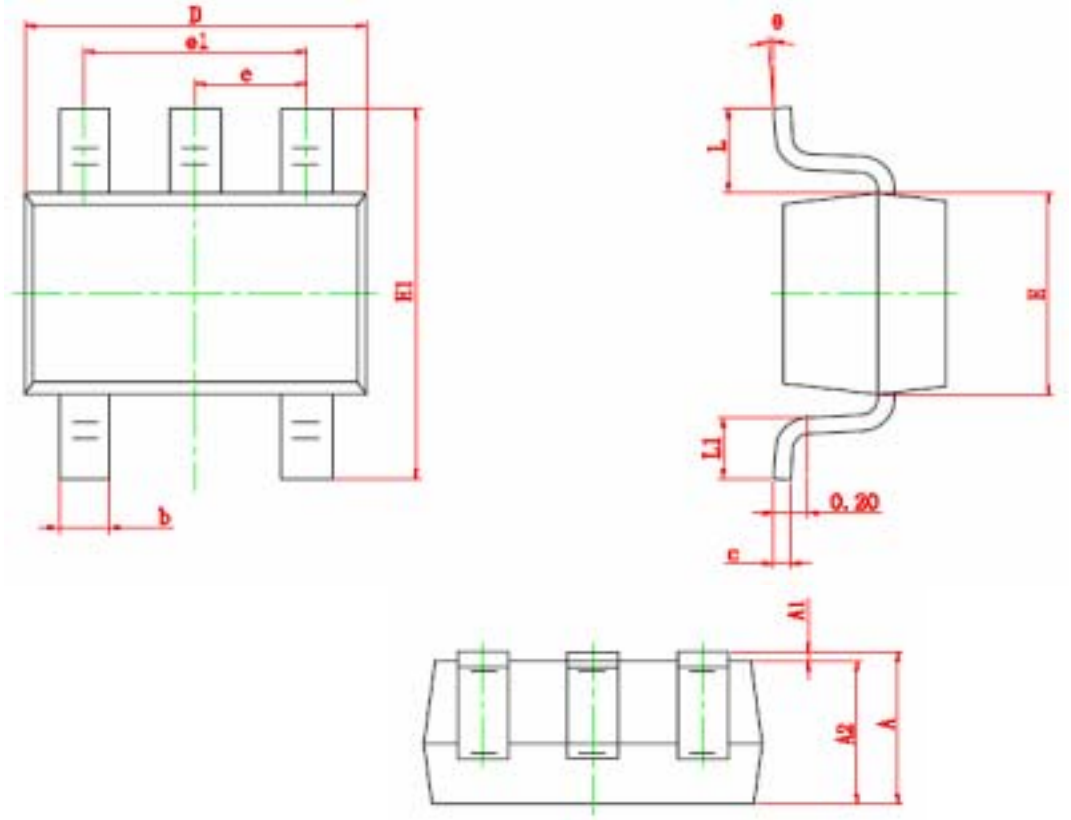
SOT-353 PACKAGE OUTLINE



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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TYPICAL CHARACTERICTICS (25℃ Unless noted)

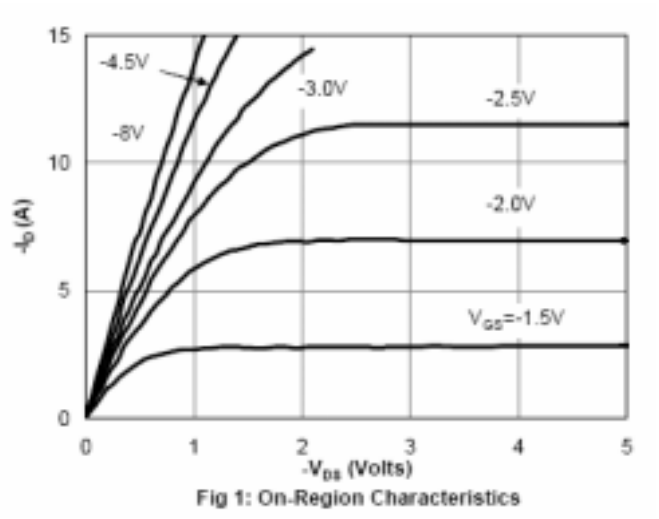

Fig 1: On-Region Characteristics

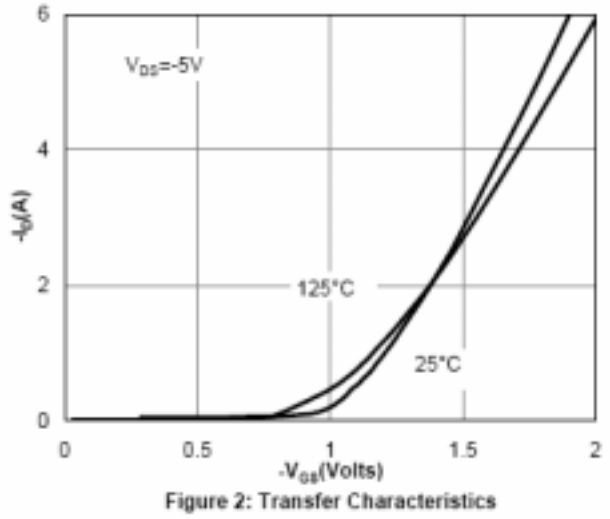

Figure 2: Transfer Characteristics

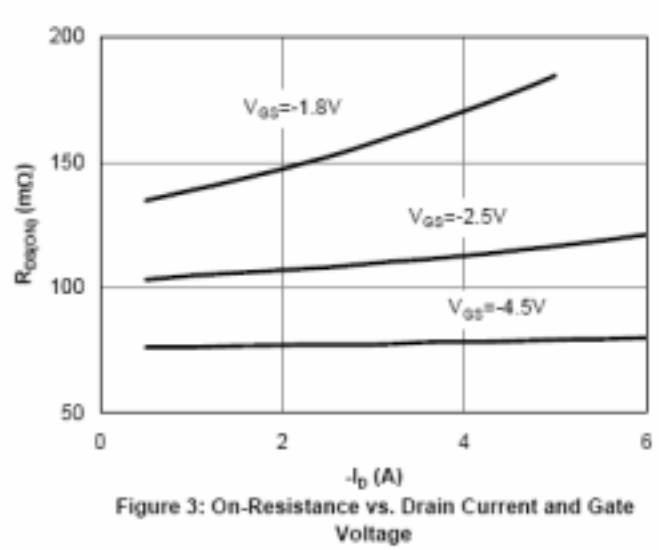

Figure 3: On-Resistance vs. Drain Current and Gate Voltage

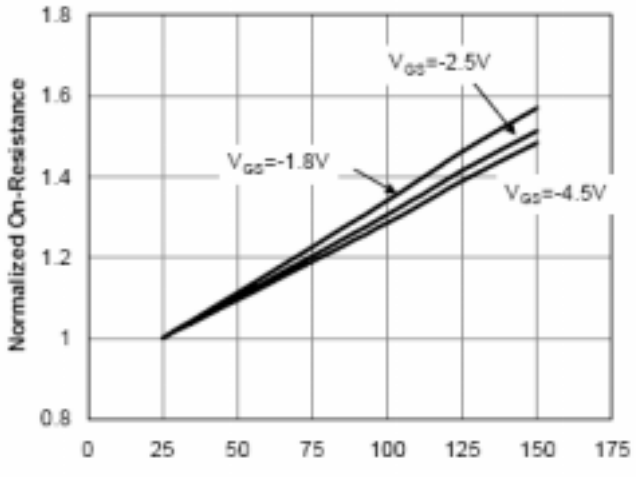

Figure 4: On-Resistance vs. Junction Temperature

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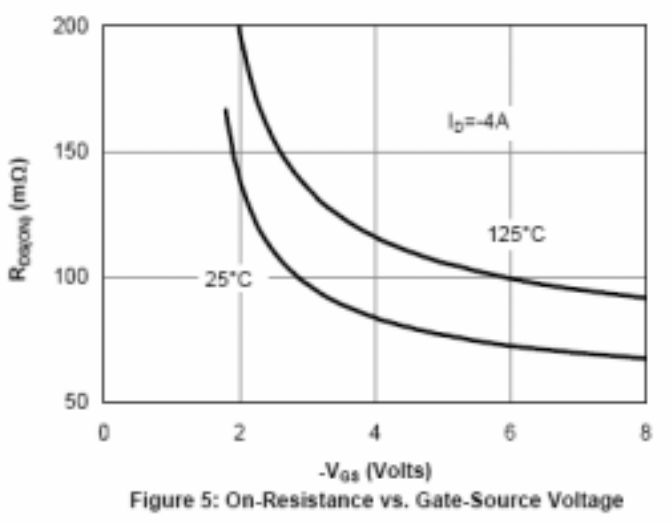

Figure 5: On-Resistance vs. Gate-Source Voltage

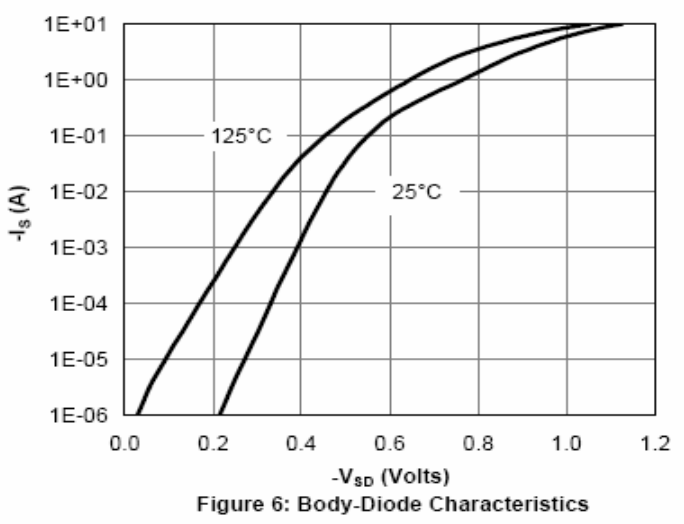

Figure 6: Body-Diode Characteristics

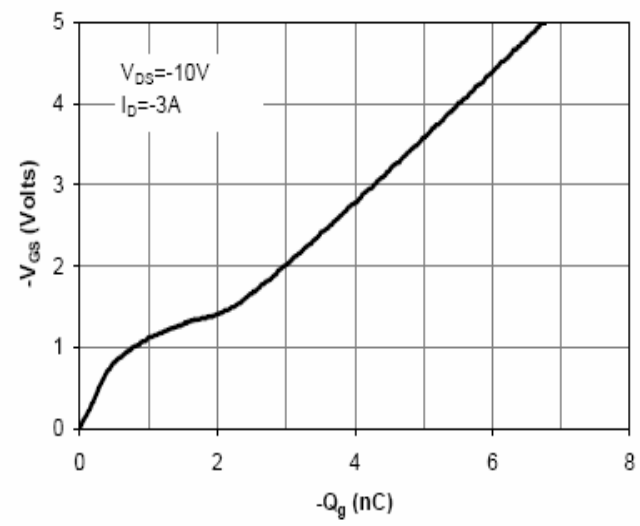

Figure 7: Gate-Charge Characteristics

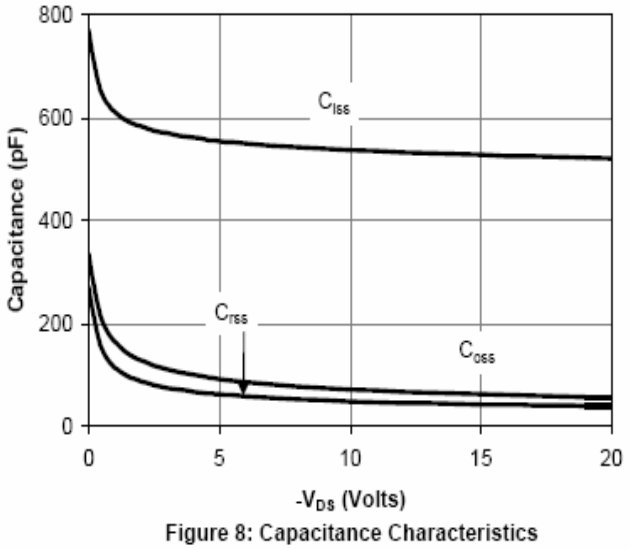

Figure 8: Capacitance Characteristics

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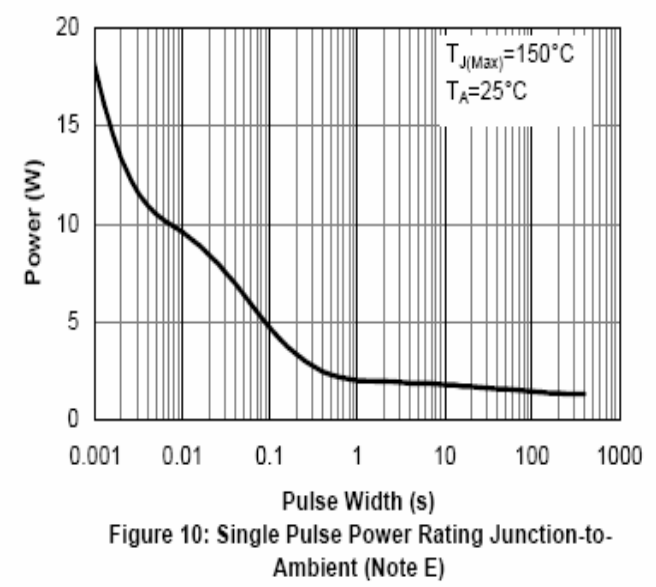

Figure 10: Single Pulse Power Rating Junction-to-Ambient (Note E)

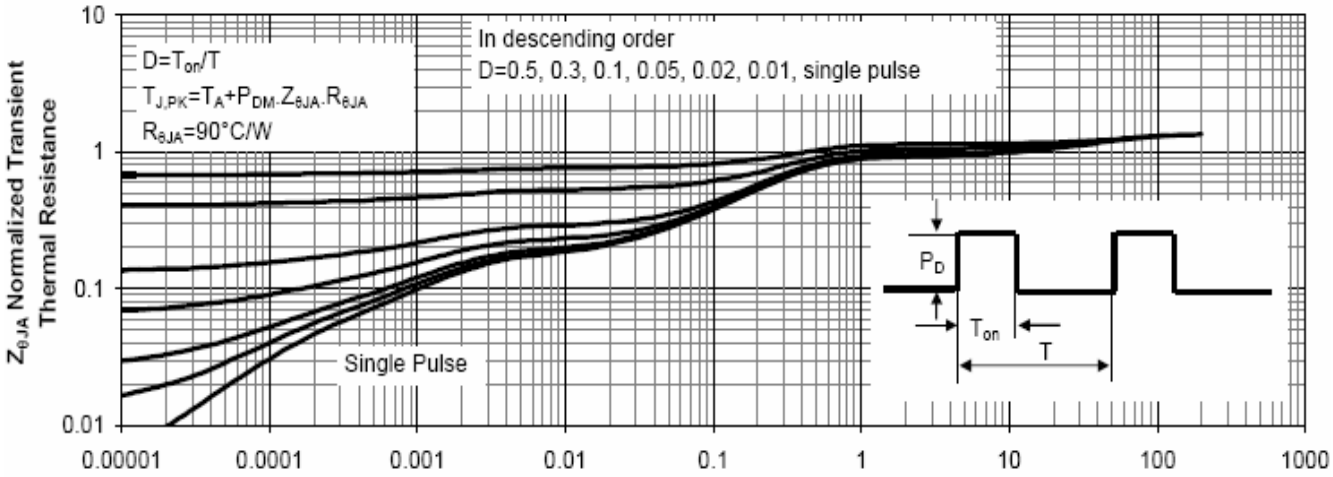

Figure 11: Normalized Maximum Transient Thermal Impedance

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