

General Description

The HSS5P04A uses advanced trench technology to provide excellent $R_{DS(ON)}$, superior switching performance and high avalanche breakdown tolerance. This device can be widely used in the field of power management of uninterruptible power supply and inverter system. The HSS5P04A meet the RoHS and Green Product requirement with full function reliability

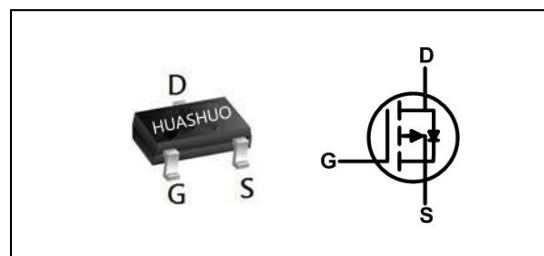
Product Summary

V_{DS}	-40	V
$R_{DS(ON),typ}$	70	m Ω
I_D	-5	A

Applications

- Uninterruptible power supply
- Inverter system

SOT-23S Pin Configuration



Absolute Maximum Ratings

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	-40	V
V_{GS}	Gate-Source Voltage	± 20	V
$I_D@T_C=25^\circ\text{C}$	Continuous Drain Current($T_J=150^\circ\text{C}$) ¹	-5	A
$I_D@T_C=100^\circ\text{C}$		-4	A
I_{DM}	Pulsed Drain Current ²	-20	A
$P_D@T_C=25^\circ\text{C}$	Total Power Dissipation ¹	0.72	W
T_{STG}	Storage Temperature Range	-55 to 150	$^\circ\text{C}$
T_J	Operating Junction Temperature Range	-55 to 150	$^\circ\text{C}$

Thermal Data

Symbol	Parameter	Typ.	Max.	Unit
$R_{\theta JA}$	Thermal Resistance Junction-Ambient ^{1,2} (Steady-State)	140	175	$^\circ\text{C/W}$
$R_{\theta JA}$	Thermal Resistance Junction-Ambient ¹ ($t \leq 10\text{s}$)	120	145	$^\circ\text{C/W}$
$R_{\theta JC}$	Thermal Resistance Junction-Case ¹	62	78	$^\circ\text{C/W}$

Note :

1.Surface mounted on 1" x 1" FR4 board, $t \leq 10\text{sec}$

2.Pulse width limited by maximum junction temperature

P-Ch 40V Fast Switching MOSFETs
Electrical Characteristics ($T_J=25\text{ }^{\circ}\text{C}$, unless otherwise noted)

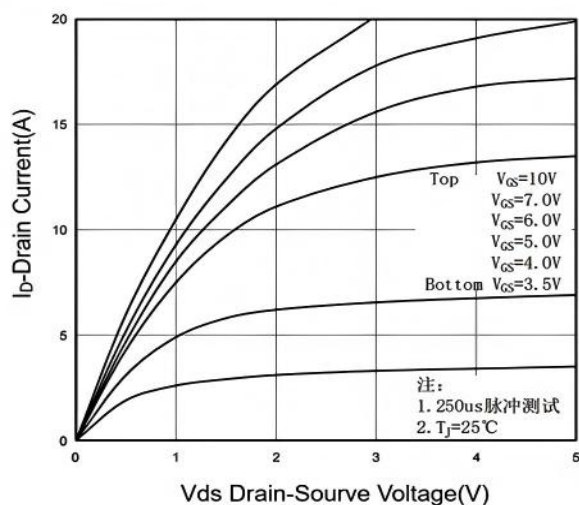
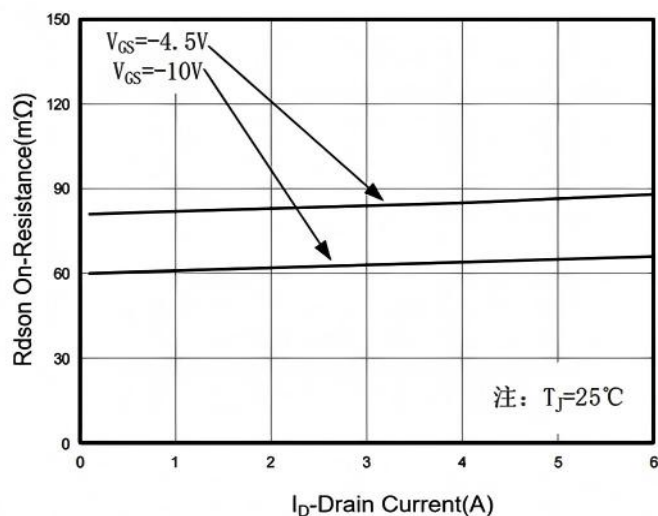
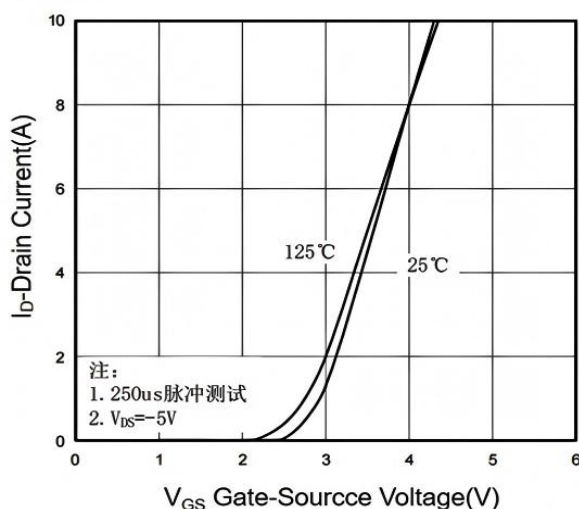
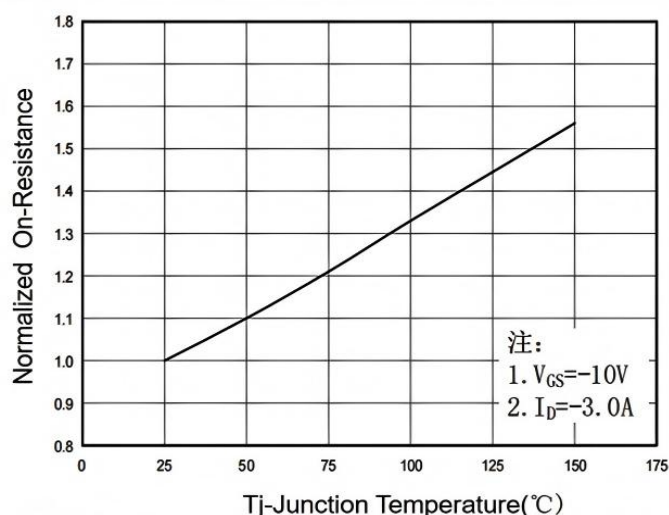
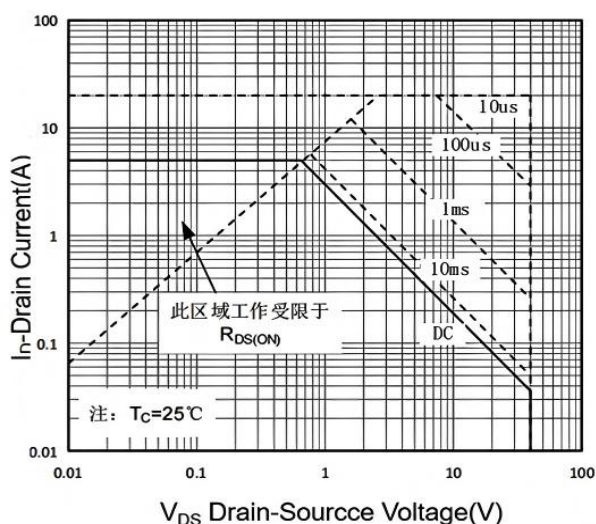
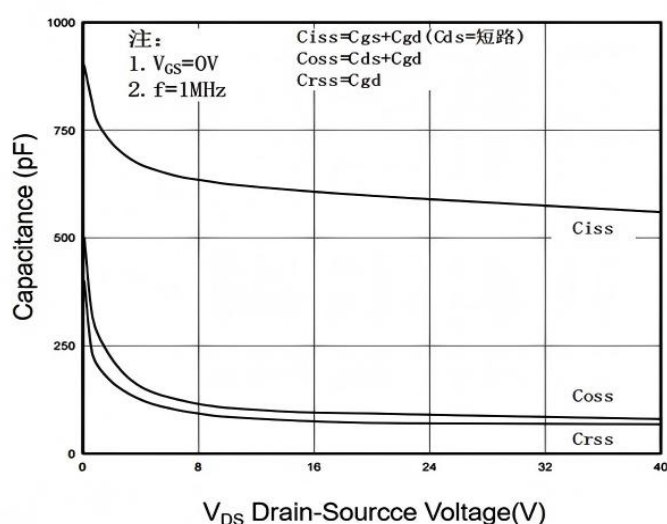
Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
BV_{DSS}	Drain-Source Breakdown Voltage	$V_{GS}=0V$, $I_D=-250\mu A$	-40	---	---	V
$R_{DS(ON)}$	Static Drain-Source On-Resistance ²	$V_{GS}=-10V$, $I_D=-5A$	---	70	85	$m\Omega$
		$V_{GS}=-4.5V$, $I_D=-3A$	---	85	110	
$V_{GS(th)}$	Gate Threshold Voltage	$V_{GS}=V_{DS}$, $I_D=-250\mu A$	-1.0	-1.5	-2.0	V
I_{DSS}	Drain-Source Leakage Current	$V_{DS}=-40V$, $V_{GS}=0V$, $T_J=25^{\circ}\text{C}$	---	---	-1	μA
I_{GSS}	Gate-Source Leakage Current	$V_{GS}=\pm 20V$, $V_{DS}=0V$	---	---	± 100	nA
Q_g	Total Gate Charge (-4.5V)	$V_{DS}=-20V$, $V_{GS}=-10V$, $I_D=-3A$	---	14	---	nC
Q_{gs}	Gate-Source Charge		---	2.9	---	
Q_{gd}	Gate-Drain Charge		---	3.8	---	
$T_{d(on)}$	Turn-On Delay Time	$V_{DD}=-20V$, $V_{GS}=-10V$, $R_G=3.0\Omega$, $I_D=-3A$	---	9.2	---	ns
T_r	Rise Time		---	8.6	---	
$T_{d(off)}$	Turn-Off Delay Time		---	28	---	
T_f	Fall Time		---	10	---	
C_{iss}	Input Capacitance	$V_{DS}=-20V$, $V_{GS}=0V$, $f=1\text{MHz}$	---	598	---	pF
C_{oss}	Output Capacitance		---	93	---	
C_{rss}	Reverse Transfer Capacitance		---	71	---	

Diode Characteristics

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
V_{SD}	Diode Forward Voltage	$V_{GS}=0V$, $I_S=-3A$, $T_J=25^{\circ}\text{C}$	---	---	-1.2	V

Note :

1. Pulse test : Pulse width $\leq 300\text{ }\mu\text{s}$, duty cycle $\leq 2\%$
2. TGuaranteed by design, not subject to production testing

Typical Characteristics

Fig.1 Output Characteristic

Fig.2 On-Resistance vs. Drain Current

Fig.3 Transfer Characteristic

Fig.4 On-Resistance vs. Junction Temperature

Fig.5 Safe Operation Area

Fig.6 Capacitance Characteristic

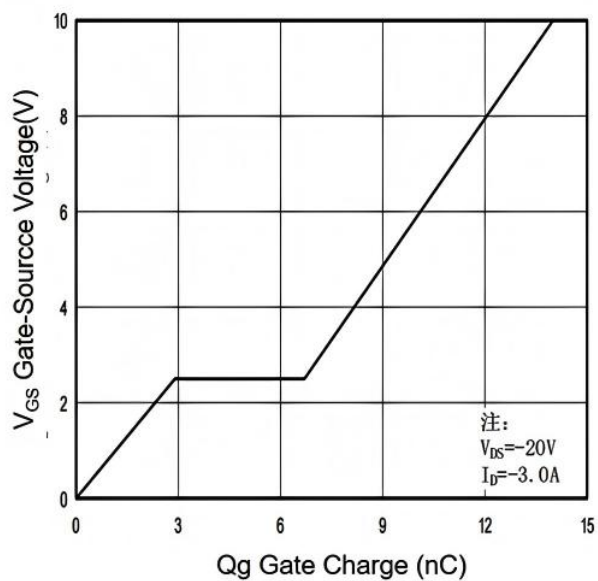


Fig.7 Gate-Charge Characteristic

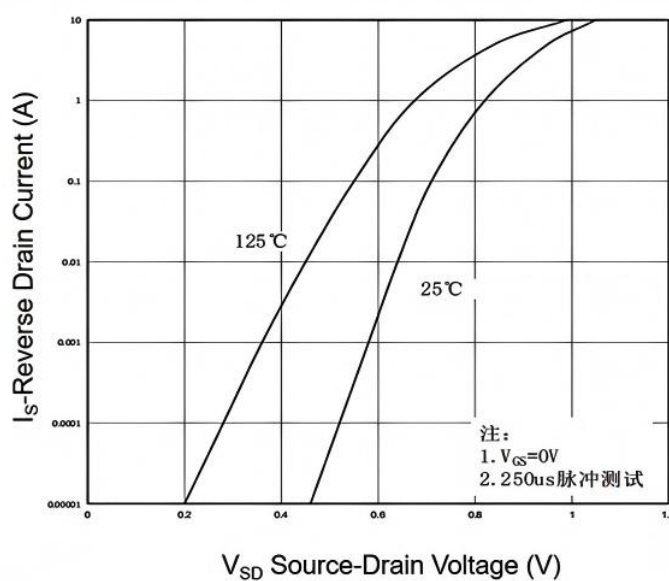
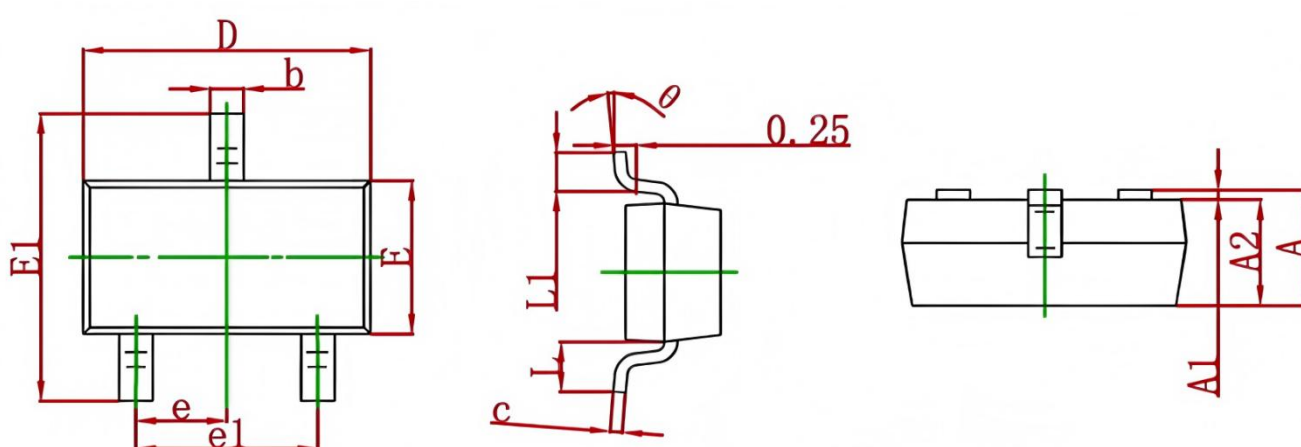


Fig.8 Body Diode Characteristic

Ordering Information

Part Number	Package code	Packaging
HSS5P04A	SOT-23S	3000/Tape&Reel

SOT-23S Package Outline



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	0.900	1.150	0.035	0.045
A1	0.000	0.100	0.000	0.004
A2	0.900	1.050	0.035	0.041
b	0.300	0.500	0.012	0.020
C	0.080	0.150	0.003	0.006
D	2.800	3.000	0.110	0.118
E	1.200	1.400	0.047	0.055
E1	2.250	2.550	0.089	0.100
e	0.950 TYP		0.037 TYP	
e1	1.800	2.000	0.071	0.079
L	0.550 REF		0.022 REF	
L1	0.300	0.500	0.012	0.020
θ	0°	8°	0°	8°

HSS5P04A TOP Marking

