



General Description

The HSSK6303 from WILLAS provide the best combination of fast switching, low on-resistance and cost-effectiveness.

The HSSK6303 meet the RoHS and Green Product requirement with full function reliability approved.

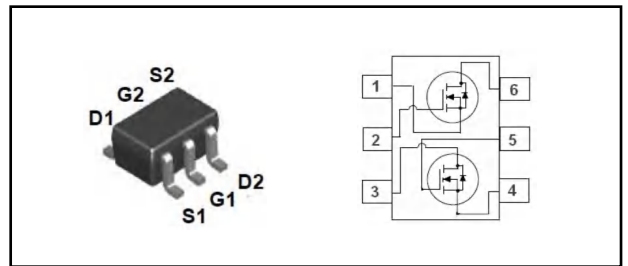
Product Summary

V_{DS}	20	V
$R_{DS(ON),typ}$	340	m Ω
I_D	0.5	A

Features

- Green Device Available
- Super Low Gate Charge
- Excellent Cdv/dt effect decline
- Advanced high cell density Trench Technology

SOT-363 Pin Configuration



Absolute Maximum Ratings

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	20	V
V_{GS}	Gate-Source Voltage	± 8	V
$I_D@T_A=25^{\circ}\text{C}$	Continuous Drain Current ¹	0.5	A
I_{DM}	Pulsed Drain Current ²	1.5	A
$P_D@T_A=25^{\circ}\text{C}$	Total Power Dissipation ³	0.3	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	---	415	$^{\circ}\text{C/W}$



Electrical Characteristics ($T_J=25^\circ\text{C}$, unless otherwise noted)

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
BV_{DSS}	Drain-Source Breakdown Voltage	$V_{GS}=0V, I_D=250\mu A$	20	---	---	V
$R_{DS(ON)}$	Static Drain-Source On-Resistance ²	$V_{GS}=4.5V, I_D=0.5A$	---	340	450	$m\Omega$
		$V_{GS}=2.5V, I_D=0.2A$	---	440	600	
$V_{GS(th)}$	Gate Threshold Voltage	$V_{GS}=V_{DS}, I_D=250\mu A$	0.65	0.8	1.5	V
I_{DSS}	Drain-Source Leakage Current	$V_{DS}=20V, V_{GS}=0V, T_J=25^\circ\text{C}$	---	---	1	μA
I_{GSS}	Gate-Source Leakage Current	$V_{GS}=\pm 12V, V_{DS}=0V$	---	---	± 10	μA
g_{fs}	Forward Transconductance	$V_{DS}=5V, I_D=0.5A$	---	1.45	---	S
Q_g	Total Gate Charge (4.5V)	$V_{DS}=5V, V_{GS}=4.5V, I_D=0.5A$	---	1.64	---	nC
Q_{gs}	Gate-Source Charge		---	0.38	---	
Q_{gd}	Gate-Drain Charge		---	0.45	---	
$T_{d(on)}$	Turn-On Delay Time	$V_{DD}=5V, V_{GS}=4.5V, R_G=50\Omega, I_D=0.5A$	---	3	---	ns
T_r	Rise Time		---	8.2	---	
$T_{d(off)}$	Turn-Off Delay Time		---	17	---	
T_f	Fall Time		---	13	---	
C_{iss}	Input Capacitance	$V_{DS}=10V, V_{GS}=0V, f=1\text{MHz}$	---	50	---	pF
C_{oss}	Output Capacitance		---	28	---	
C_{rss}	Reverse Transfer Capacitance		---	9	---	

Diode Characteristics

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
I_S	Continuous Source Current ^{1,4}	$V_G=V_D=0V$, Force Current	---	---	0.25	A
V_{SD}	Diode Forward Voltage ²	$V_{GS}=0V, I_S=1A, T_J=25^\circ\text{C}$	---	---	1.2	V

Note :

1. The data tested by surface mounted on a 1 inch² FR-4 board with 20Z copper.

2. The data tested by pulsed, pulse width $\leq 300\mu s$, duty cycle $\leq 2\%$

3. The power dissipation is limited by 150°C junction temperature

4. The data is theoretically the same as I_D and I_{DM} , in real applications, should be limited by total power dissipation.



Typical Characteristics

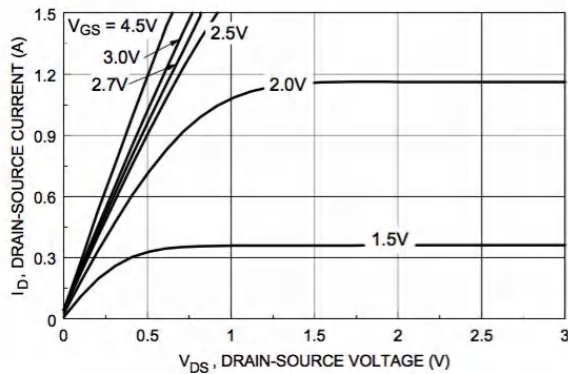


Figure 1. On-Region Characteristics.

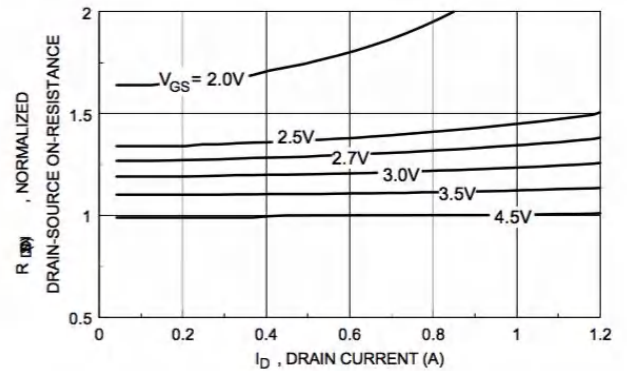


Figure 2. On-Resistance Variation with Drain Current and Gate Voltage.

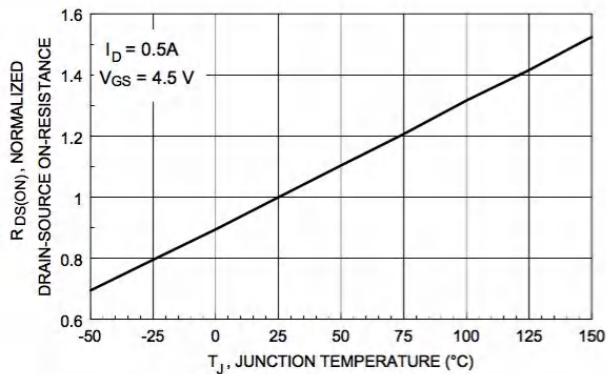


Figure 3. On-Resistance Variation with Temperature.

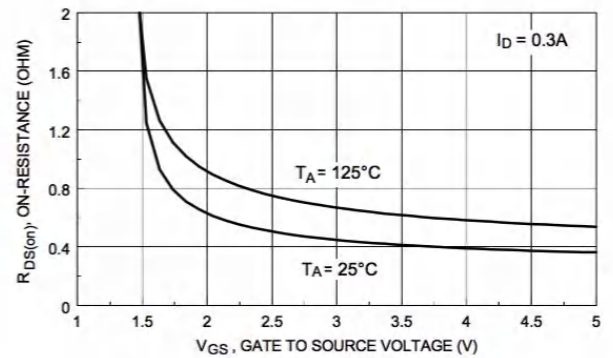


Figure 4. On-Resistance Variation with Gate-to-Source Voltage.

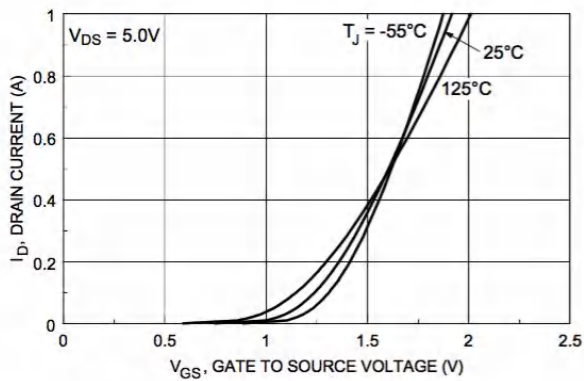


Figure 5. Transfer Characteristics.

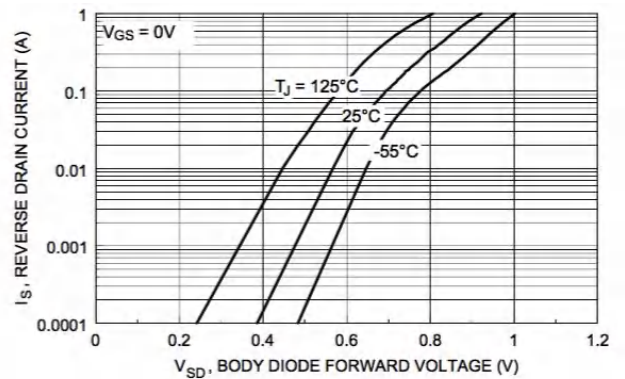


Figure 6 . Body Diode Forward Voltage Variation with Source Current and Temperature.

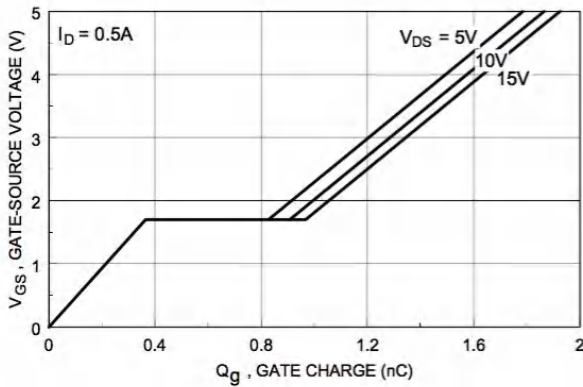


Figure 7. Gate Charge Characteristics.

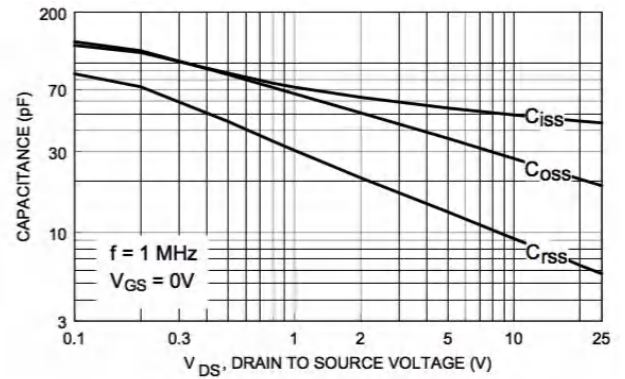


Figure 8. Capacitance Characteristics.

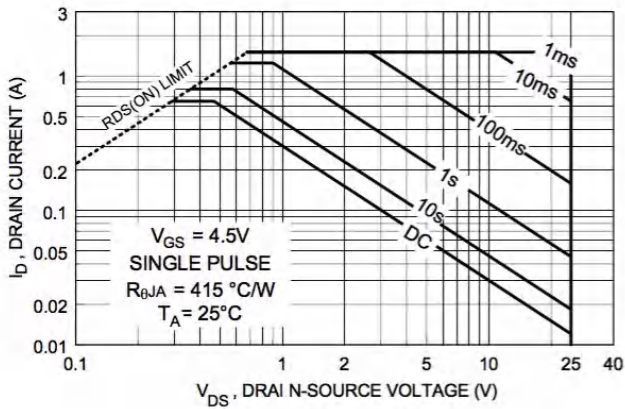


Figure 9. Maximum Safe Operating Area.

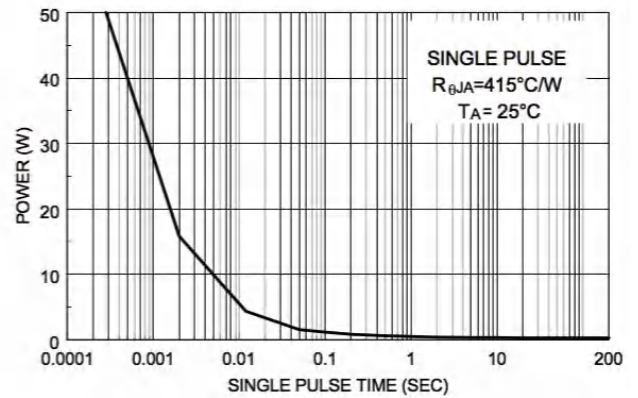


Figure 10. Single Pulse Maximum Power Dissipation.

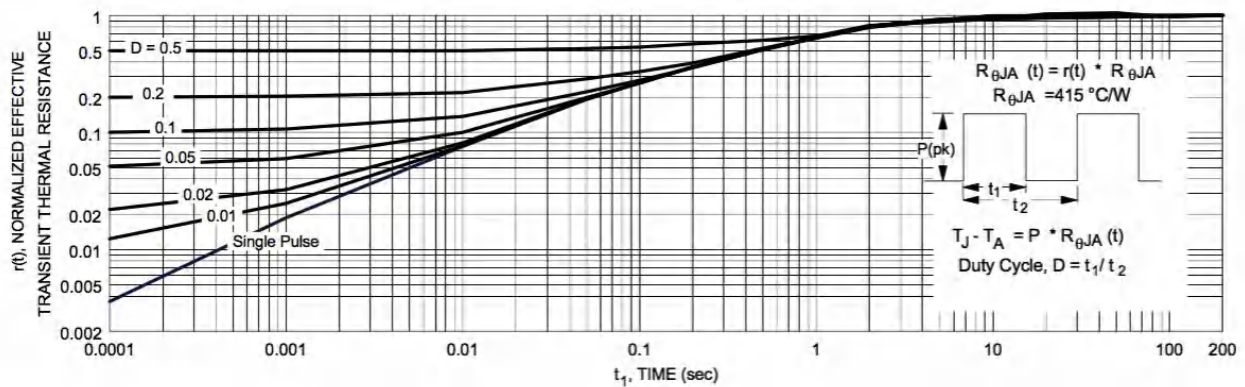


Figure 11. Transient Thermal Response Curve.

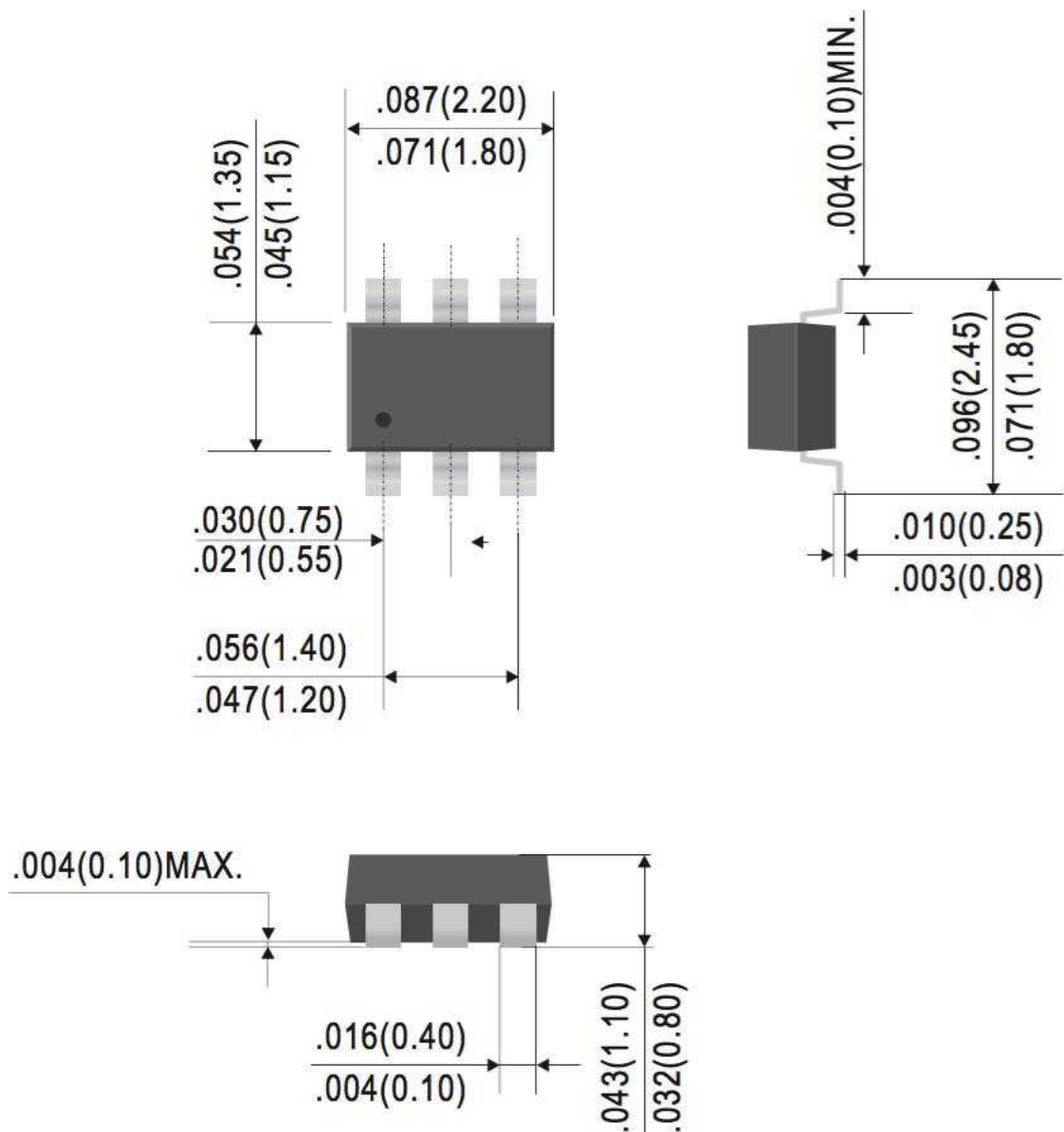
Thermal characterization performed using the conditions described in note 1.
Transient thermal response will change depending on the circuit board design.



Ordering Information

Part Number	Package code	Packaging
HSSK6303	SOT-363	3000/Tape&Reel

SOT-363 Package Outline





HSSK6303 TOP Marking

