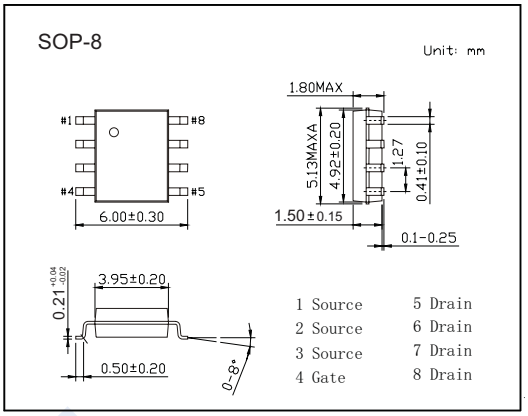
N-Channel MOSFET

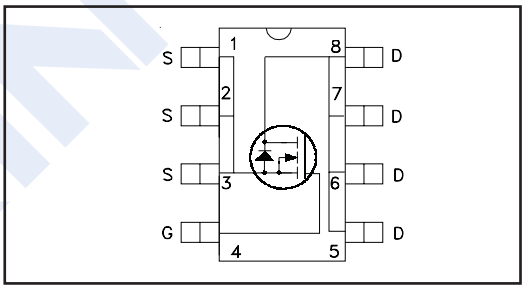
STS6NF20V

■ Features

- V_{DS} (V) = 20V
- I_D = 6 A
- $R_{DS(ON)}$ < 40mΩ (V_{GS} = 4.5V)
- $R_{DS(ON)}$ < 45mΩ (V_{GS} = 2.7V)
- Ultra Low Threshold Gate Drive
- Standard Outline For Easy Automated Surface Mount Assembly



INTERNAL SCHEMATIC DIAGRAM



■ Absolute Maximum Ratings Ta = 25℃

Parameter		Symbol	Rating	Unit
Drain-Source Voltage		V_{DS}	20	V
Drain-Gate Voltage (R_{GS} = 20kΩ)		V_{DGR}	20	
Gate-Source Voltage		V_{GS}	±12	
Continuous Drain Current	T_C=25℃	I_D	6	A
	T_C=100℃		3.8	
Pulsed Drain Current		I_{DM} 1)	24	
Total Dissipation		P_{tot}	2.5	W
Thermal Resistance.Junction- to-Ambient		R_{thJA}	50	℃/W
Junction Temperature		T_J	150	℃
Storage Temperature Range		T_{stg}	-55 to 150	

1) Pulse width limited by safe operation area.

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■ Electrical Characteristics Ta = 25℃ unless othewise specified

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Drain-Source Breakdown Voltage	V_{DSS}	I_D=250μA, V_{GS}=0V	20			V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS}=18V, V_{GS}=0V			1	μA
		V_{DS}=18V, V_{GS}=0V, T_C=125℃			10	
Gate-Body Leakage Current	I_{GSS}	V_{DS}=0V, V_{GS}=±12V			±100	nA
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS}=V_{GS}, I_D=250μA	0.5		1	V
Static Drain-Source On-Resistance	$R_{DS(ON)}$	V_{GS}=4.5V, I_D=3A			40	mΩ
		V_{GS}=2.7V, I_D=3A			45	
Forward Transconductance	g_{FS}	V_{DS}=15V, I_D=3A		10		S
Input Capacitance	C_{iss}	V_{GS}=0V, V_{DS}=15V, f=1MHz		460		pF
Output Capacitance	C_{oss}			200		
Reverse Transfer Capacitance	C_{rss}			50		
Turn-On DelayTime	$t_{d(on)}$	V_{DD}=10V, ID=3A, R_G=4.7Ω, V_{GS}=4.5V (Resistive Load, Figure 1)		7		ns
Turn-On Rise Time	t_r			33		
Turn-Off DelayTime	$t_{d(off)}$			27		
Turn-Off Fall Time	t_f			10		
Total Gate Charge	Q_g	V_{DD}=16V, I_D=6A, V_{GS}=4.5V (see test circuit, Figure 2)		8.5	11.5	nC
Gate Source Charge	Q_{gs}			1.8		
Gate Drain Charge	Q_{gd}			2.4		
Body Diode Reverse Recovery Time	t_{rr}	I_{SD}= 6A, dI/dt = 100A/μs, V_{DD}=10V, T_j=150℃ (see test circuit, Figure 3)		26		ns
Body Diode Reverse Recovery Charge	Q_{rr}			13		nC
Body Diode Reverse Recovery Current	I_{RRM}			1		A
Maximum Body-Diode Continuous Current	I_{SD}				6	A
Maximum Body-Diode Current (Pulsed)	I_{SDM} [1]				24	
Diode Forward Voltage	V_{SD} [2]	I_{SD}=6A, V_{GS}=0V			1.2	V

1) Pulsed: Pulse duration = 300 μs, duty cycle 1.5%.

2) Pulse width limited by safe operation area.

■ Marking

Marking	6N20V KC****

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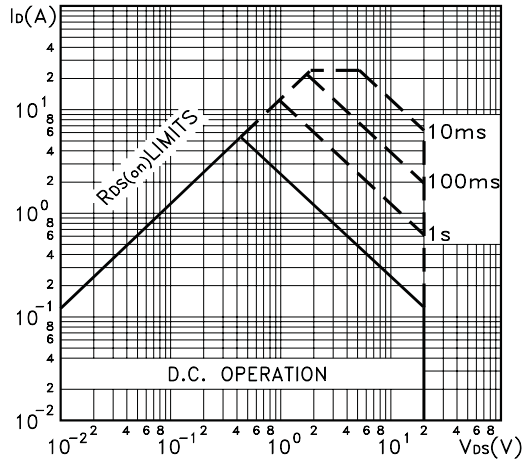
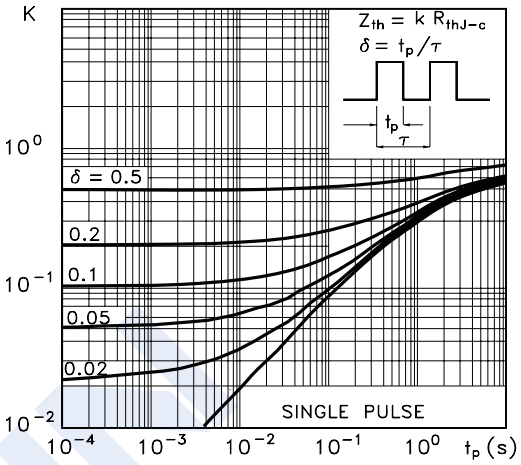
■ Typical Characterisitics

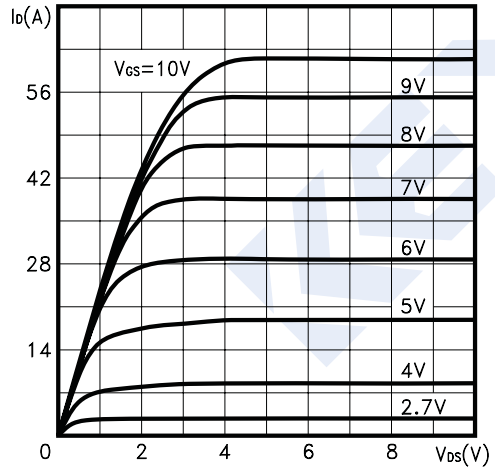
Safe Operating Area



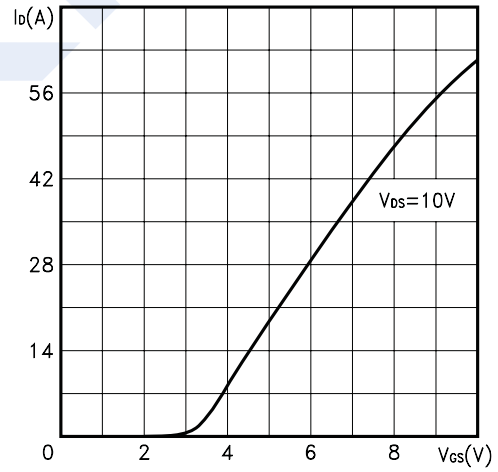
Thermal Impedance



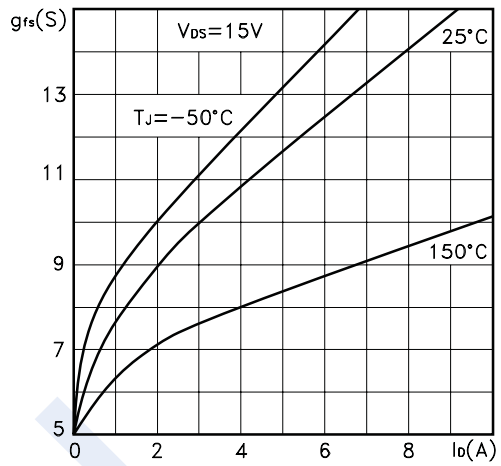
Output Characteristics



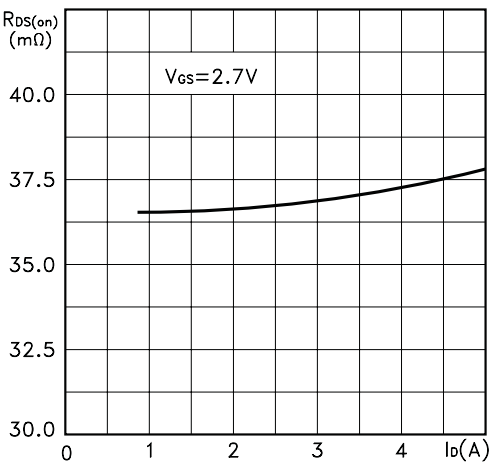
Transfer Characteristics



Transconductance



Static Drain-source On Resistance



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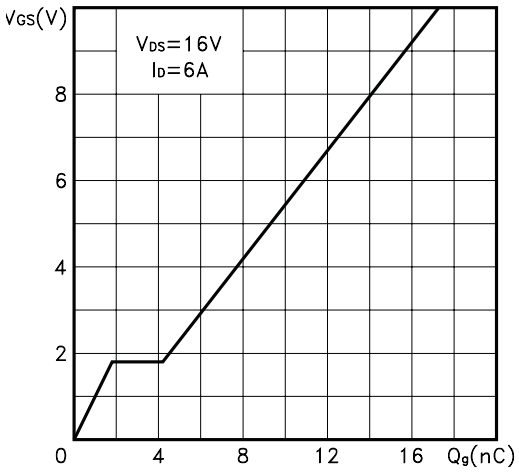
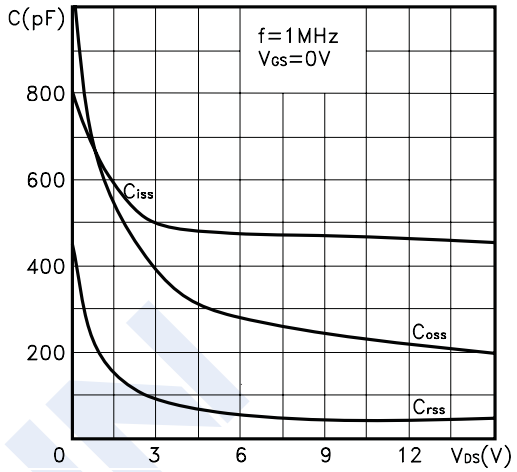
■ Typical Characterisitics

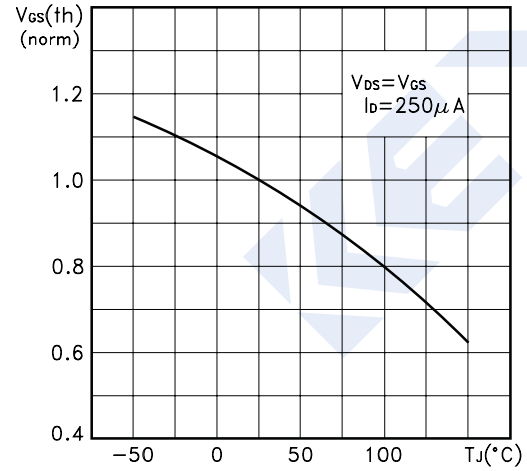
Gate Charge vs Gate-source Voltage



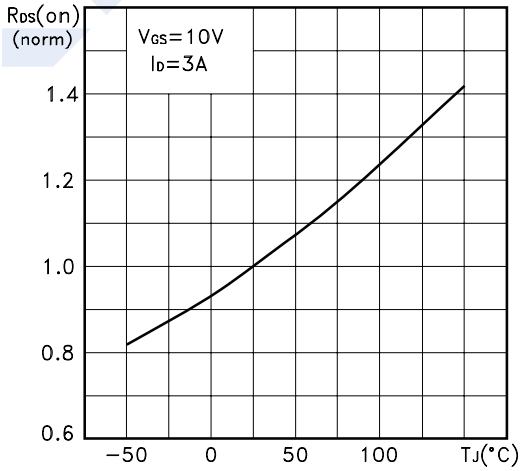
Capacitance Variations



Normalized Gate Threshold Voltage vs Temperature



Normalized on Resistance vs Temperature



Source-drain Diode Forward Characteristics