

20V P-Ch Power MOSFET

Feature

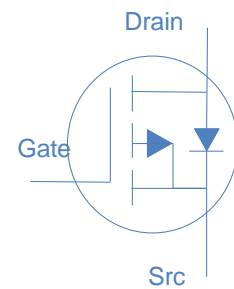
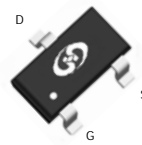
- High Speed Power Switching, Logic Level
- Enhanced Avalanche Ruggedness
- Lead Free, Halogen Free

V_{DS}		-20	V
$R_{DS(on),typ}$	$V_{GS}=4.5V$	83	$m\Omega$
$R_{DS(on),typ}$	$V_{GS}=2.5V$	110	$m\Omega$
I_D (Silicon Limited)		-3	A

Application

- Load Switches
- Hard Switching and High Speed Circuit
- BLDC Motor

SOT23



Part Number	Package	Marking
HTJ1KOP02	SOT-23	21

Absolute Maximum Ratings at $T_A=25$ (unless otherwise specified)

Parameter	Symbol	Conditions	Value	Unit
Continuous Drain Current (Silicon Limited)	I_D	$T_A=25$	-3	A
		$T_A=70$	-2.4	
Drain to Source Voltage	V_{DS}	-	-20	V
Gate to Source Voltage	V_{GS}	-	-12	V
Pulsed Drain Current	I_{DM}	-	-12	A
Power Dissipation	P_D	$T_A=25$	1.25	W
Operating and Storage Temperature	T_J, T_{stg}	-	-55 to 150	

Absolute Maximum Ratings

Parameter	Symbol	Max	Unit
Thermal Resistance Junction-Ambient	$R_{\theta JA}$	100	$^{\circ}W$

Electrical Characteristics at $T_j=25$ (unless otherwise specified)
Static Characteristics

Parameter	Symbol	Conditions	Value			Unit
			min	typ	max	
Drain to Source Breakdown Voltage	$V_{(BR)DSS}$	$V_{GS}=0V, I_D=-250\mu A$	-20	-	-	V
Gate Threshold Voltage	$V_{GS(th)}$	$V_{GS}=V_{DS}, I_D=-250\mu A$	-0.3	-0.75	-1.0	
Zero Gate Voltage Drain Current	I_{DSS}	$V_{GS}=0V, V_{DS}=-16V, T_j=25$	-	-	-1	μA
		$V_{GS}=0V, V_{DS}=-16V, T_j=125$	-	-	-10	
Gate to Source Leakage Current	I_{GSS}	$V_{GS}=-12V, V_{DS}=0V$	-	-	-100	nA
Drain to Source on Resistance	$R_{DS(on)}$	$V_{GS}=-4.5V, I_D=-3A$	-	83	100	m Ω
		$V_{GS}=-2.5V, I_D=-2.5A$	-	110	135	
Transconductance	g_{fs}	$V_{DS}=-5V, I_D=-3A$	-	5	-	S

Dynamic Characteristics

Input Capacitance	C_{iss}	$V_{GS}=0V, V_{DS}=-10V, f=1MHz$	-	382	-	pF
Output Capacitance	C_{oss}		-	70	-	
Reverse Transfer Capacitance	C_{riss}		-	60	-	
Total Gate Charge	Q_g	$V_{DD}=-10V, I_D=-3A, V_{GS}=-4.5V$	-	7.2	-	nC
Gate to Source Charge	Q_{gs}		-	1.2	-	
Gate to Drain (Miller) Charge	Q_{gd}		-	2.3	-	
Turn on Delay Time	$t_{d(on)}$	$V_{DD}=-10V, I_D=-1A, V_{GS}=-4.5V, R_G=6\Omega$	-	10	-	ns
Rise time	t_r		-	20	-	
Turn off Delay Time	$t_{d(off)}$		-	15	-	
Fall Time	t_f		-	12	-	

Reverse Diode Characteristics

Diode Forward Voltage	V_{SD}	$V_{GS}=0V, I_F=-2A$	-		-1.2	V
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Fig 1. Typical Output Characteristics

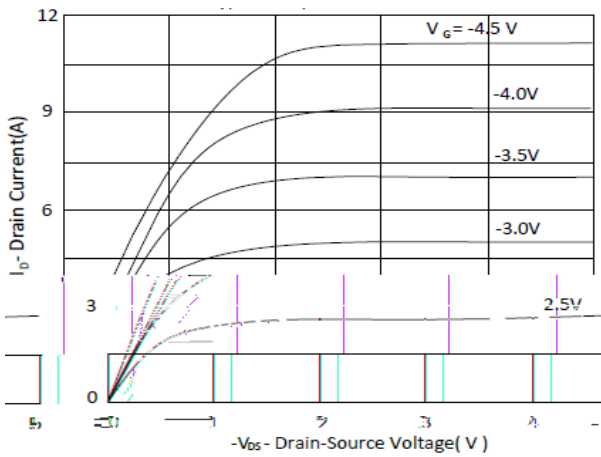


Figure 2. On-Resistance vs. Gate-Source Voltage

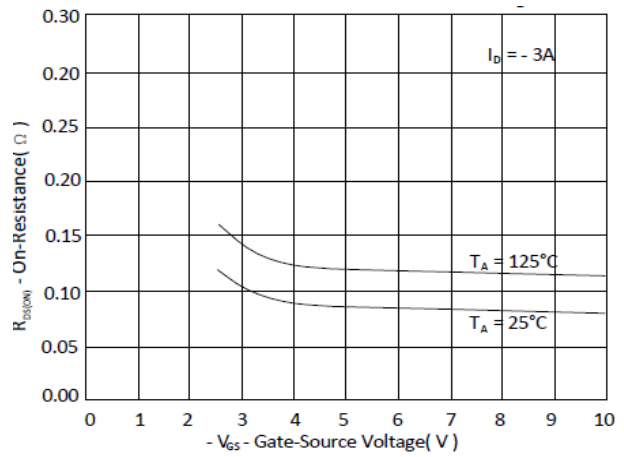


Figure 3. On-Resistance vs. Drain Current and Gate Voltage

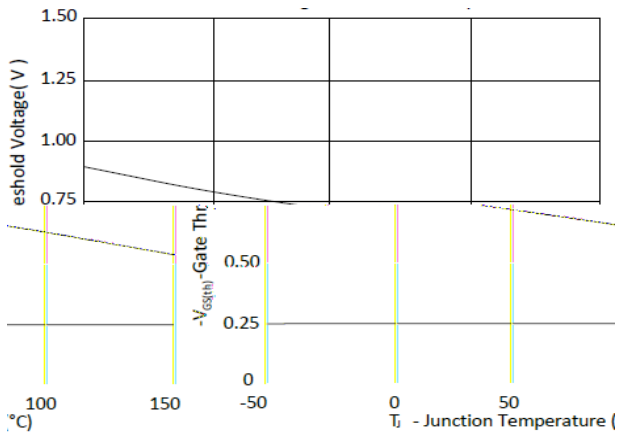


Figure 4. Normalized On-Resistance vs. Junction Temperature

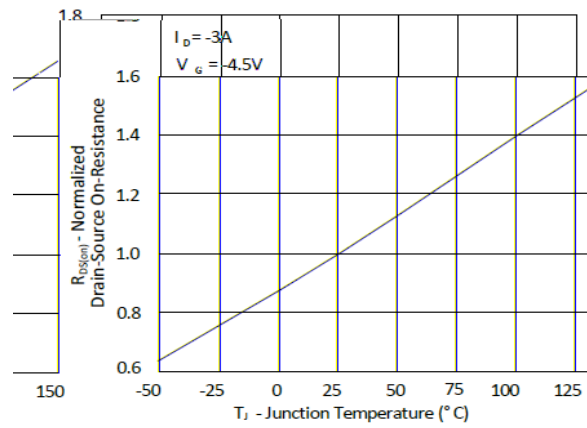


Figure 5. Typical Source-Drain Diode Forward Voltage

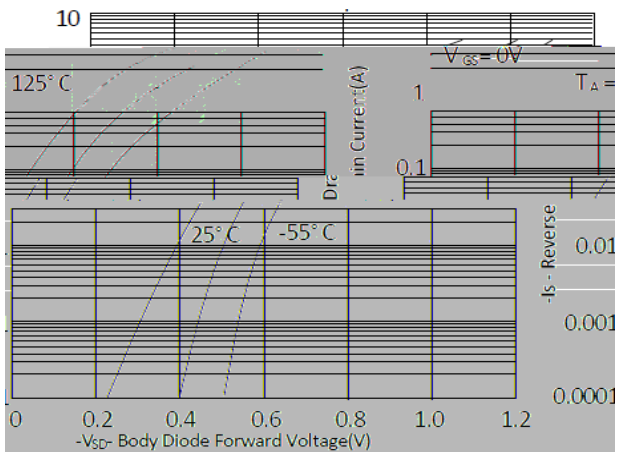


Figure 6. Typical Gate-Charge vs. Gate-to-Source Voltage

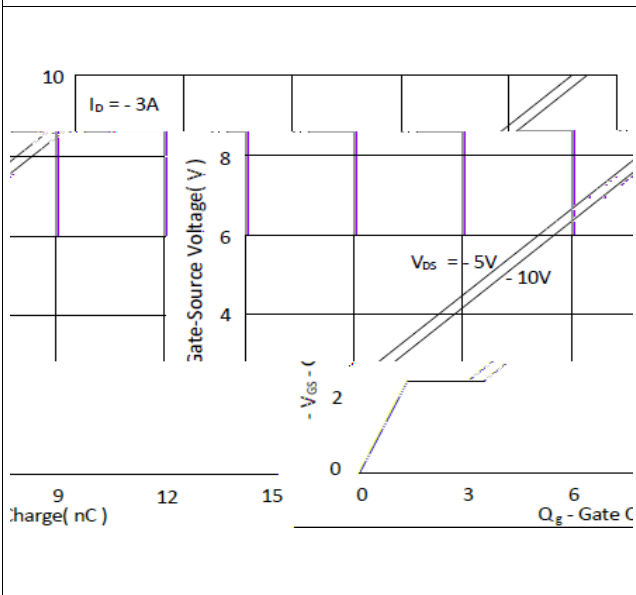


Figure 7. Typical Capacitance vs. Drain-to-Source Voltage

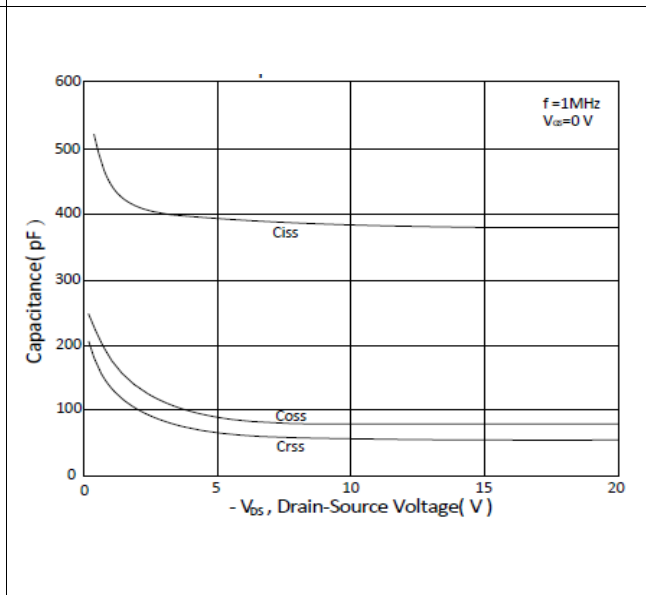


Figure 8. Maximum Safe Operating Area

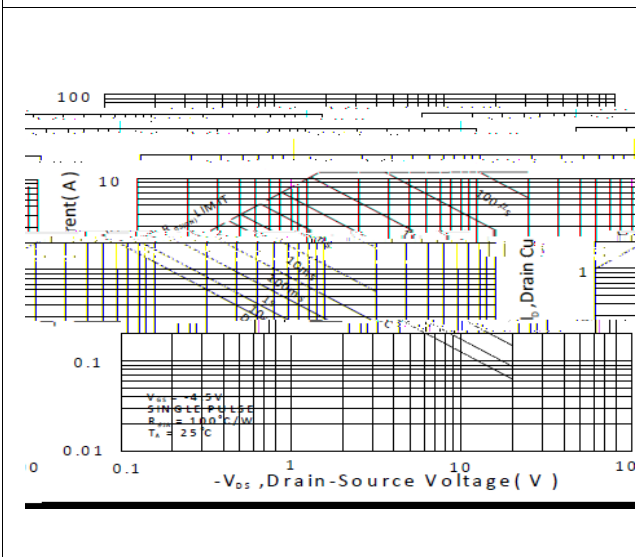


Figure 9. Maximum Drain Current vs. Case Temperature

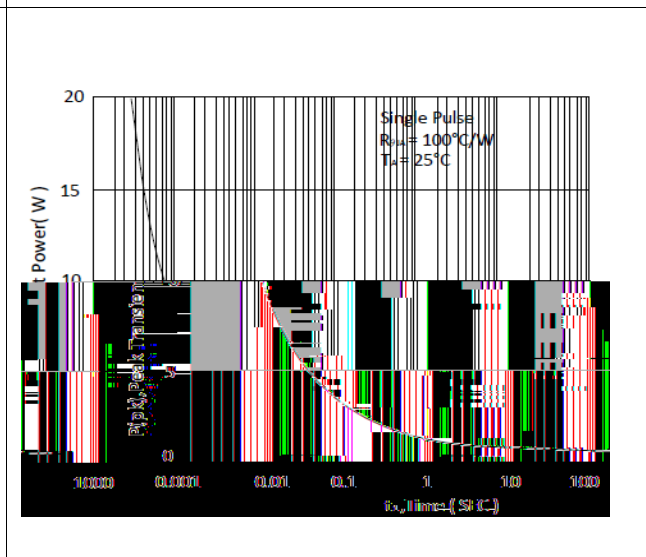
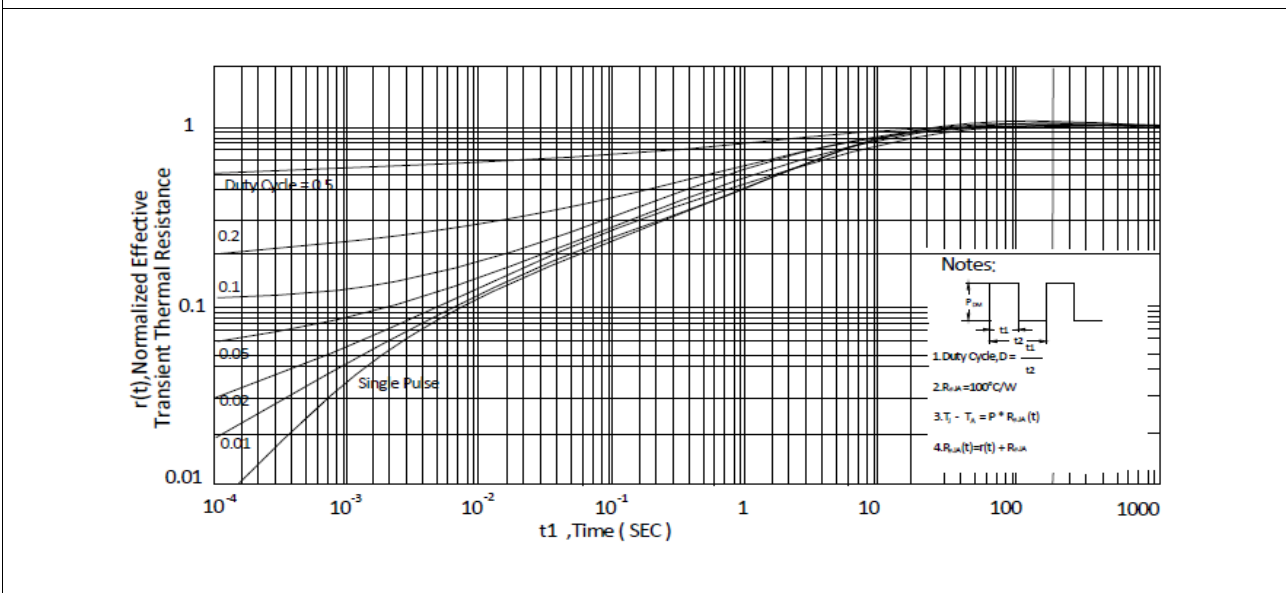


Figure 10. Normalized Maximum Transient Thermal Impedance, Junction-to-Ambient



Inductive switching Test

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Gate Charge Test

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Uclamped Inductive Switching (UIS) Test

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Diode Recovery Test

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