30V N-Ch Power MOSFET

Feature

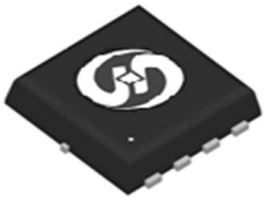
◇ High Speed Power Switching, Logic Level
◇ Enhanced Avalanche Ruggedness
◇ 100% UIS Tested, 100% Rg Tested
◇ Lead Free

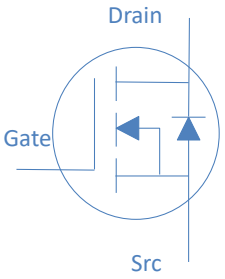
V_{DS}		30	V
$R_{DS(on),typ}$	V_{GS}=10V	8.4	mΩ
$R_{DS(on),typ}$	V_{GS}=4.5V	11	mΩ
I_D		28	A

Application

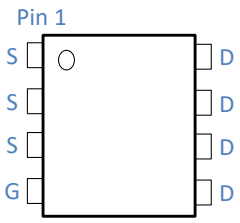
◇ Hard Switching and High Speed Circuit
◇ DC/DC in Telecoms and Inductrial

DFN3.3x3.3





Part Number	Package	Marking
HTM120N03P	DFN 3.3*3.3	TM120N03P



Absolute Maximum Ratings at T_j=25℃ (unless otherwise specified)

Parameter	Symbol	Conditions	Value	Unit
Continuous Drain Current	I_D	T_C=25℃	28	A
		T_C=100℃	24	
Drain to Source Voltage	V_{DS}	-	30	V
Gate to Source Voltage	V_{GS}	-	±20	V
Pulsed Drain Current	I_{DM}	-	52	A
Avalanche Energy, Single Pulse	E_{AS}	L=0.1mH, T_C=25℃	16.0	mJ
Power Dissipation	P_D	T_C=25℃	23	W
Operating and Storage Temperature	T_J, T_{stg}	-	-55 to150	℃

Absolute Maximum Ratings

Parameter	Symbol	Max	Unit
Thermal Resistance Junction-Ambient	$R_{\theta JA}$	65	℃/W
Thermal Resistance Junction-Case	$R_{\theta JC}$	5.4	℃/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=250μA	30	-	-	V
Gate Threshold Voltage	$V_{GS(th)}$	V_{GS}=V_{DS}, I_D=250μA	1.1	1.6	2.1	
Zero Gate Voltage Drain Current	I_{DSS}	V_{GS}=0V, V_{DS}=24V, T_j=25℃	-	-	1	μA
Gate to Source Leakage Current	I_{GSS}	V_{GS}=±20V, V_{DS}=0V	-	-	±100	nA
Drain to Source on Resistance	$R_{DS(on)}$	V_{GS}=10V, I_D=10A	-	8.4	10	mΩ
		V_{GS}=4.5V, I_D=5A	-	11.0	14	
Transconductance	g_{fs}	V_{DS}=5V, I_D=10A	-	2.5	-	S
Gate Resistance	R_G	V_{GS}=0V, V_{DS} Open, f=1MHz	-	3.5	-	Ω

Dynamic Characteristics

Input Capacitance	C_{iss}	V_{GS}=0V, V_{DS}=15V, f=1MHz	-	873	-	pF
Output Capacitance	C_{oss}		-	111	-	
Reverse Transfer Capacitance	C_{rss}		-	99	-	
Total Gate Charge	Q_g(10V)	V_{DD}=15V, I_D=10A, V_{GS}=10V,R_G=1.3Ω,	-	20.3	-	nC
	Q_g(4.5V)		-	10.3	-	
Gate to Source Charge	Q_{gs}		-	2.5	-	
Gate to Drain (Miller) Charge	Q_{gd}		-	4.9	-	
Turn on Delay Time	$t_{d(on)}$	V_{DD}=15V, I_D=10A, V_{GS}=10V, R_G=3Ω,	-	15	-	ns
Rise time	t_r		-	28	-	
Turn off Delay Time	$t_{d(off)}$		-	28	-	
Fall Time	t_f		-	14	-	

Reverse Diode Characteristics

Diode Forward Voltage	V_{SD}	V_{GS}=0V, I_F=1A	-	0.7	1.1	V
Reverse Recovery Time	t_{rr}	I_F=1A, $d_{IF/dt}$=100A/μs	-	25	-	ns
Reverse Recovery Charge	Q_{rr}		-	10.5	-	nC

Fig 1. Typical Output Characteristics

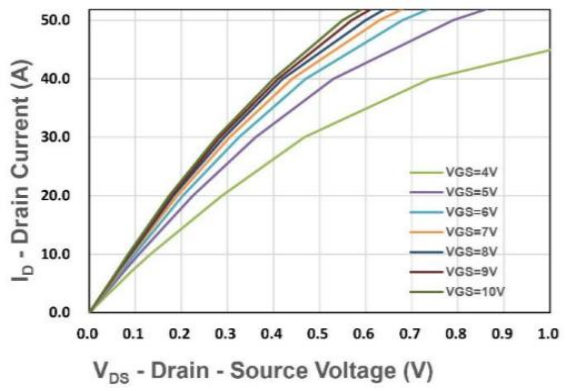


Figure 2. On-Resistance vs. Gate-Source Voltage

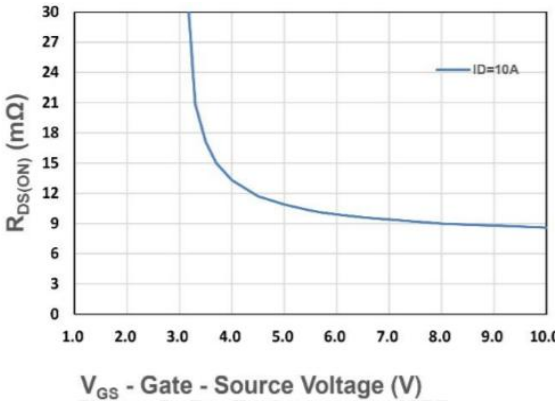


Figure 3. On-Resistance vs. Drain Current and Gate Voltage

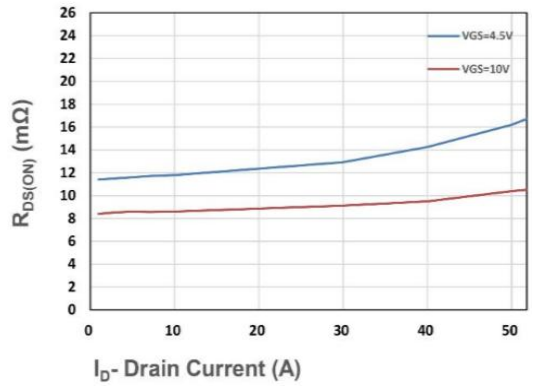


Figure 4. Normalized On-Resistance vs. Junction Temperature

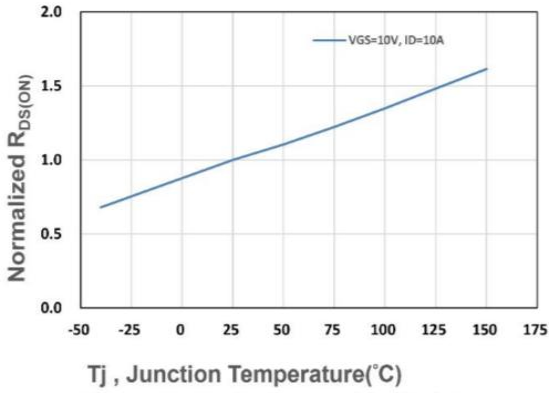


Figure 5. Normalized Threshold Voltage vs. Junction Temperature

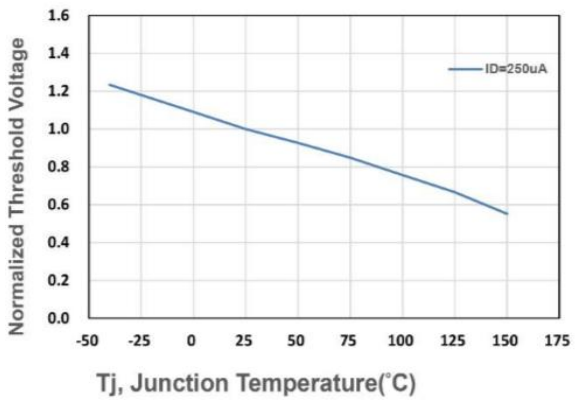


Figure 6. Typical Source-Drain Diode Forward Voltage

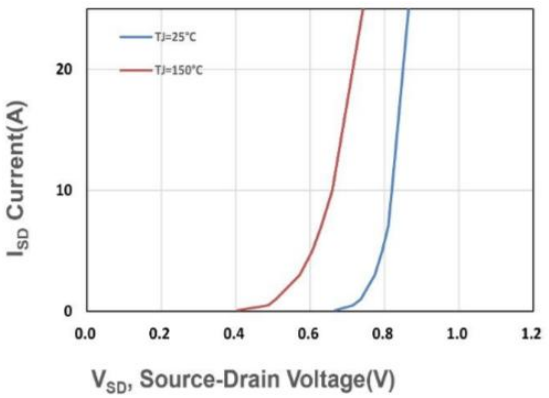


Figure 7. Typical Gate-Charge vs. Gate-to-Source Voltage

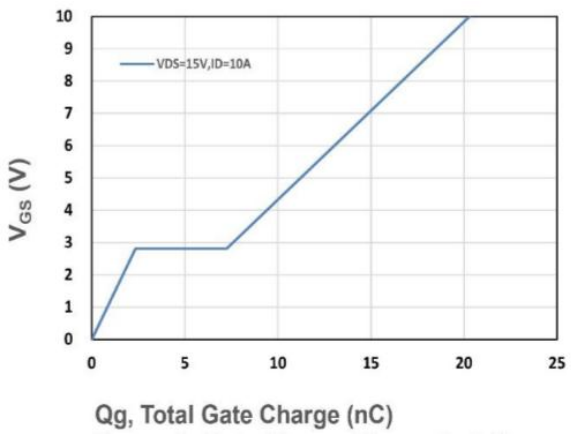


Figure 8. Typical Capacitance vs. Drain-to-Source Voltage

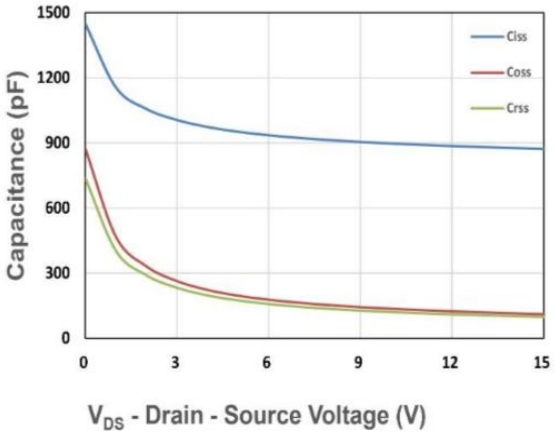


Figure 9. Maximum Safe Operating Area

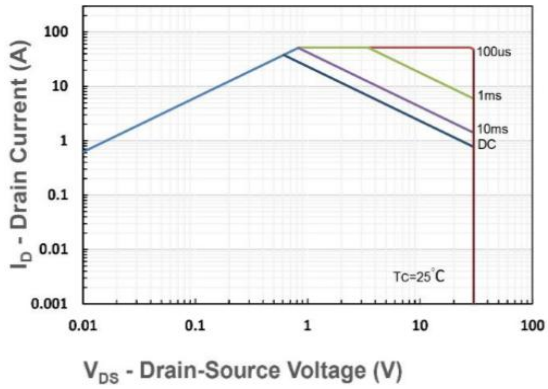


Figure 10. Maximun Drain Current vs. Case Temperature

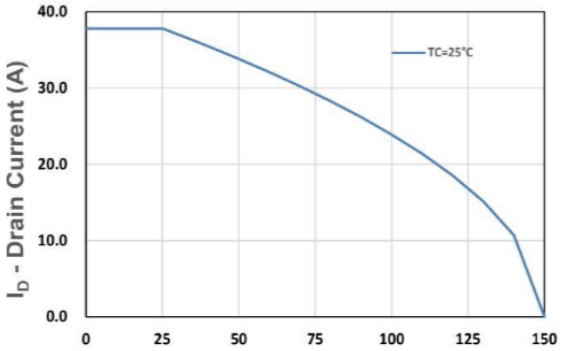
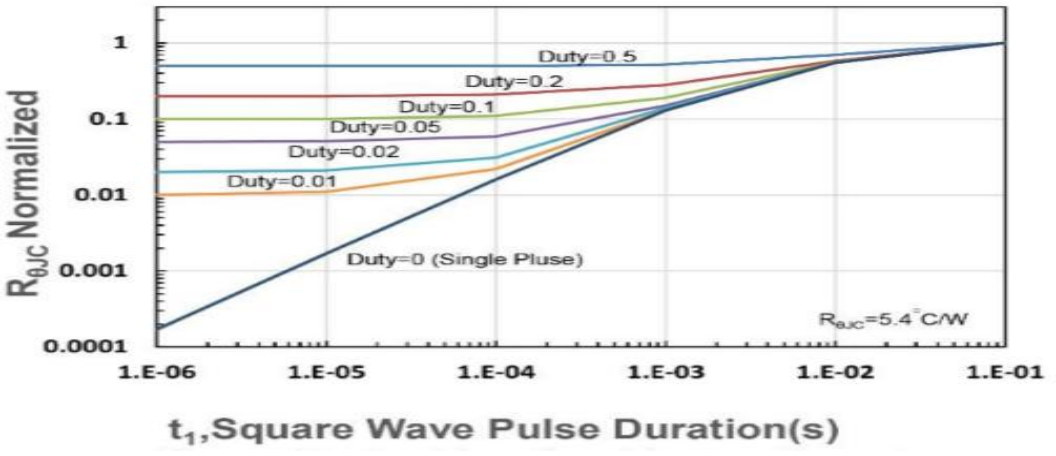
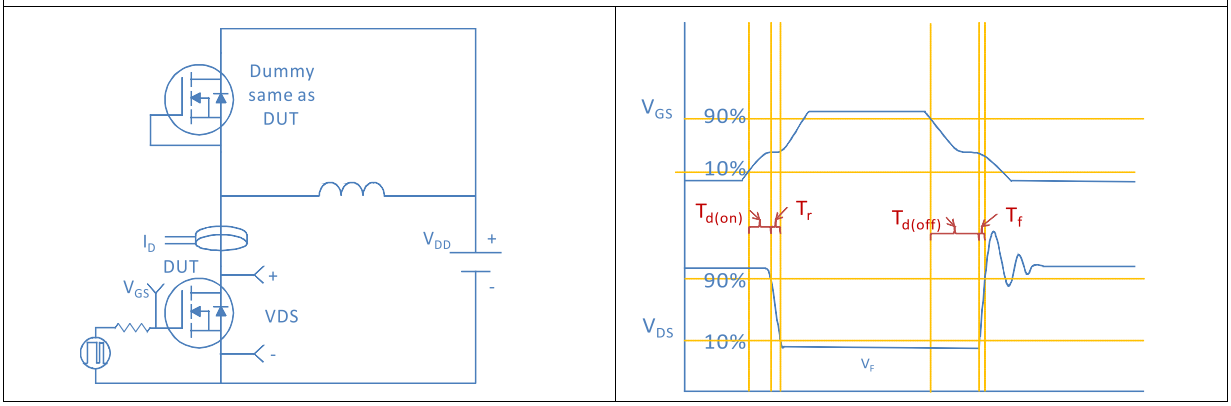


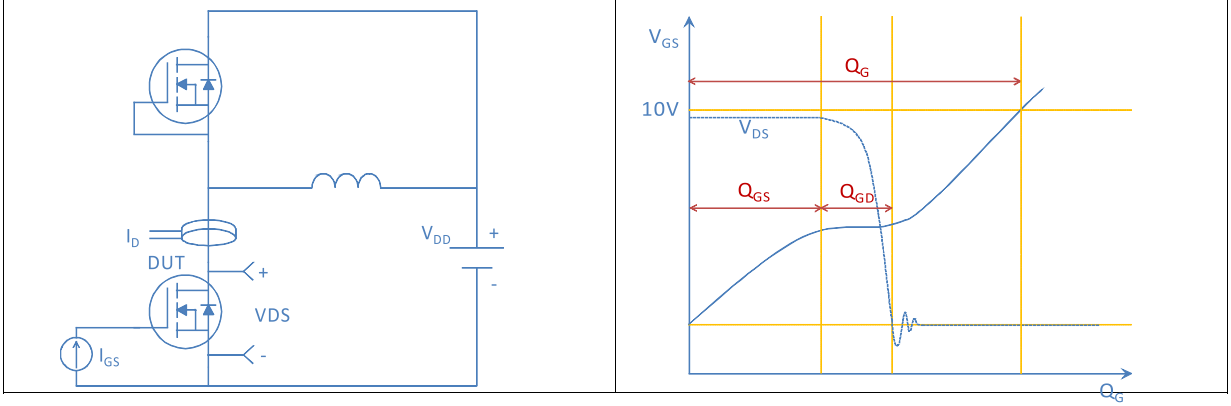
Figure 11. Normalized Maximum Transient Thermal Impedance, Junction-to-Ambient



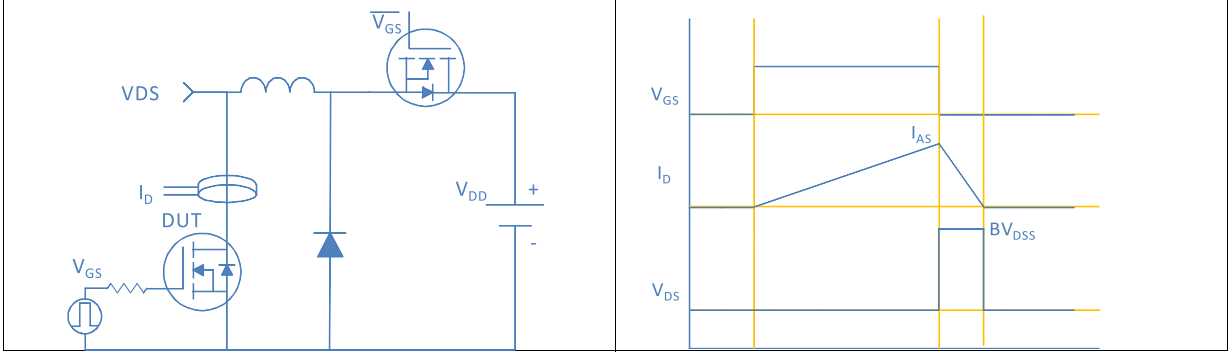
Inductive switching Test



Gate Charge Test



Uclamped Inductive Switching (UIS) Test



Diode Recovery Test