Features

- Split Gate Trench MOSFET technology
- Excellent package for heat dissipation
- High density cell design for low $RDS_{(ON)}$

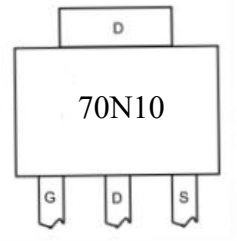
Bvdss	Rdson	ID
100V	8.5mΩ	70A

Application

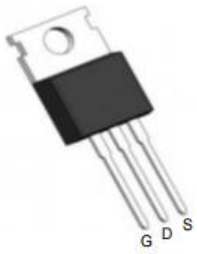
RoHS

- DC-DC Converters
- Power management function
- Synchronous-rectification applications

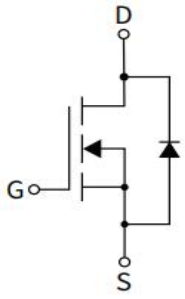
Package



Marking and pin assignment



TO220 top view



Schematic diagram

Package Marking and Ordering Information

Device Marking	Device	Device Package	Quantity
70N10	S70N10T	TO220	50

Absolute Maximum Ratings (T_C=25℃unless otherwise specified)

Parameter		Symbol	Value	Unit
Drain-Source Voltage		V_{DS}	100	V
Gate-Source Voltage		V_{GS}	±20	V
Continuous Drain Current	I_D@T_C = 25℃	I_D	70	A
	I_D@T_C = 100℃		45	A
Pulsed Drain Current[1]		I_{DM}	280	A
Single Pulsed Avalanche Energy[2]		E_{AS}	110	mJ
Avalanche Current		I_{AS}	-	A
Power Dissipation		P_D	100	W
Operating Junction Temperature Range		T_J	150	℃
Storage Temperature Range		T_{STG}	-55 ~ 150	℃

Thermal Resistance Ratings

Parameter	Symbol	Value	Unit
Thermal Resistance, Junction-to-Ambient	$R_{\theta JA}$	64	℃/W
Thermal Resistance, Junction-to-Case	$R_{\theta JC}$	1.25	℃/W

Ordering Information

Ordering Number	Package	Pin Assignment			Packing
Halogen Free		G	D	S	
HLS70N10T	TO220	1	2	3	Tube

Electrical Characteristics (T_A=25℃unless otherwise noted)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Units
Drain to Source Breakdown Voltage	V_{DSS}	I_D = 250μA, V_{GS} = 0V	100	-	-	V
Drain-Source Leakage Current	I_{DSS}	V_{DS}=100V,V_{GS}=0V	-	-	1	μA
Gate to Source Leakage Current	I_{GSS}	V_{GS}=±20V , V_{DS}=0V	-	-	±100	nA
Gate Threshold Voltage	$V_{GS(th)}$	V_{GS}=V_{DS}, I_D =250uA	1.3	1.8	2.3	V
Static Drain-Source On-Resistance	$R_{DS(on)}$	V_{GS}=10V,I_D=20A	-	8.5	10.5	mΩ
		V_{GS}=4.5V,I_D=15A	-	9.5	15	
Gate Resistance	R_g	V_{GS}=0V, V_{DS} Open	-	0.48	-	Ω
Input Capacitance	C_{iss}	V_{GS}=0V, V_{DS}=50V, f = 1MHz	-	1368	-	pF
Output Capacitance	C_{oss}		-	451	-	
Reverse Transfer Capacitance	C_{rss}		-	12.9	-	
Total Gate Charge	Q_g	V_{GS}=10V,V_{DS}=50V, I_D=10A	-	31.3	-	nC
Gate Source Charge	Q_{gs}		-	3.49	-	
Gate Drain Charge	Q_{gd}		-	7.63	-	
Turn-ON Delay Time	$t_{d(on)}$	V_{GS}=10V,V_{DS}=50V, I_D=10A,R_G=4Ω	-	16	-	ns
Rise Time	t_r		-	10	-	
Turn-OFF Delay Time	$t_{d(off)}$		-	40	-	
Fall Time	t_f		-	6	-	
Diode Forward Current	I_S	T_C=25℃	-	-	70	A
Diode Forward Voltage	V_{SD}	I_S=10A,V_{GS}=0V	-	-	1.2	V
Reverse Recovery time	t_{rr}	I_S=10A,V_{DD}=50V, dI/dt=100A/us	-	103	-	ns
Reverse Recovery Charge	Q_{rr}		-	187	-	nC

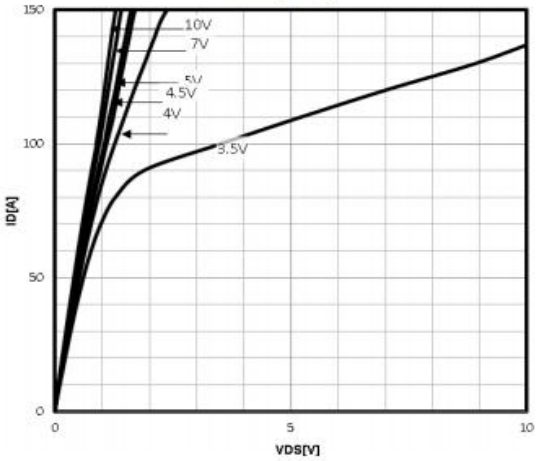
Notes:

1.Repetitive rating; pulse width limited by maximum junction temperature.

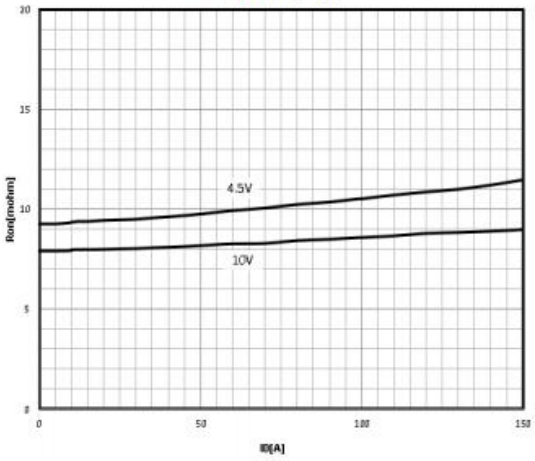
2.V_{DD}=50V, L=0.3mH, Rg=25Ω, Starting TJ=25 ℃.

Typical Performance Characteristics

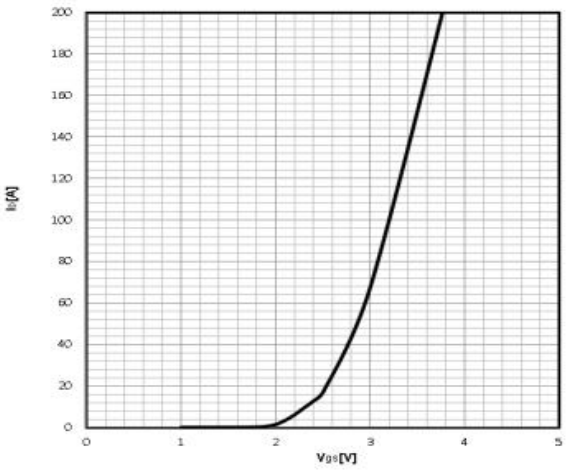
Typ. output characteristics
$I_D=f(V_{DS})$



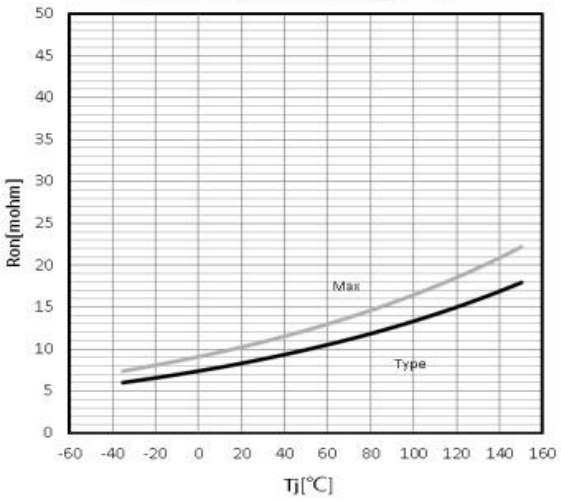
Typ. drain-source on resistance
$R_{DS(on)}=f(I_D)$



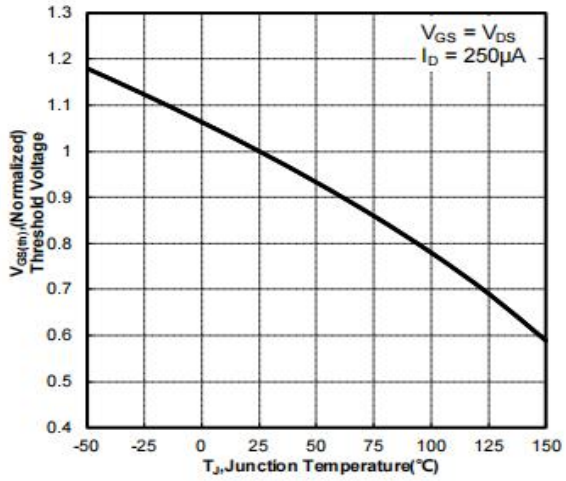
Typ. transfer characteristics
$I_D=f(V_{GS})$



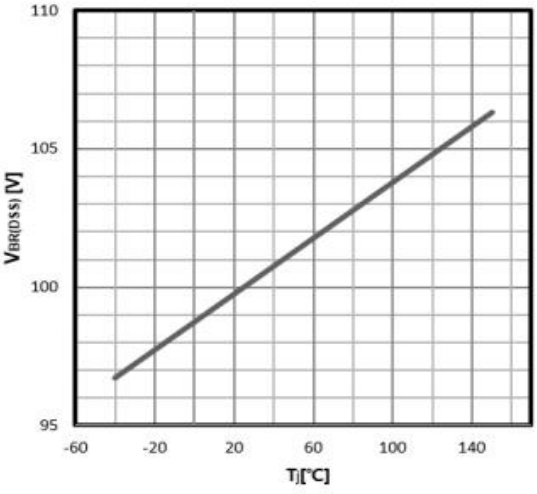
Drain-source on-state resistance
$R_{DS(on)}=f(T_j);I_D=20A;\ V_{GS}=10V$



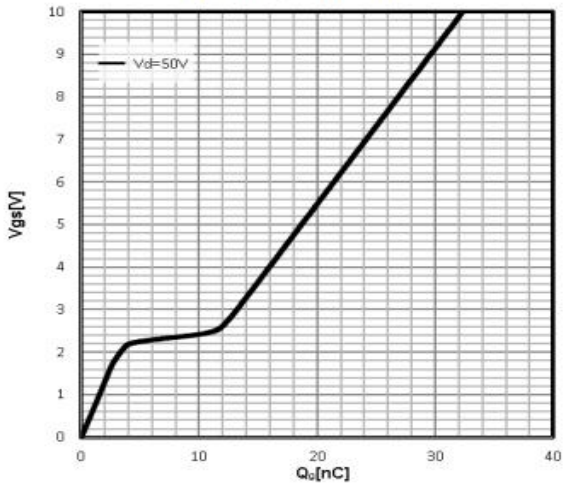
Gate Threshold Voltage
$V_{TH}=f(T_j);\ I_D=250uA$



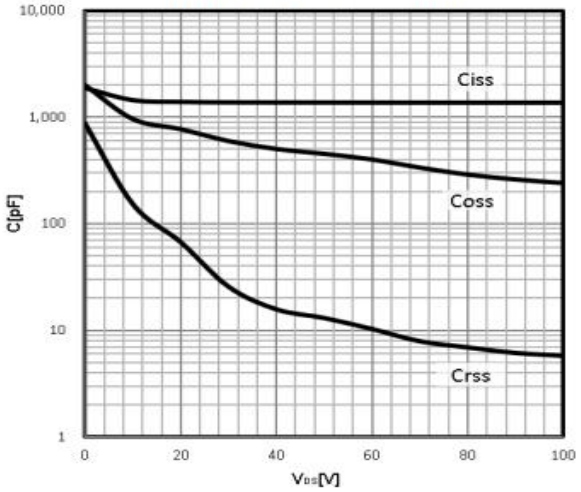
Drain-source breakdown voltage
$V_{BR(DSS)}=f(T_j);\ I_D=250uA$



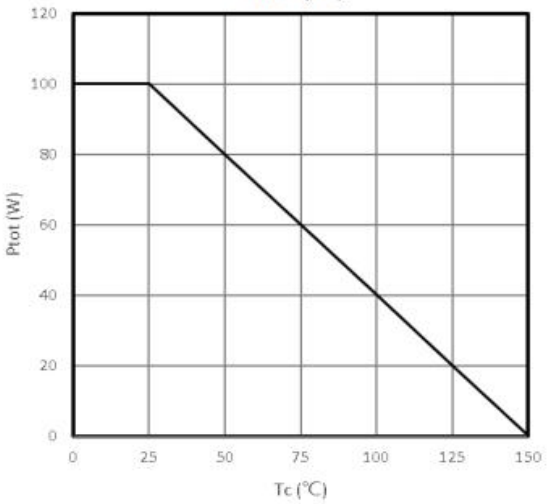
Typ. gate charge
V_{GS}=f(Q_g) ; I_D=10A



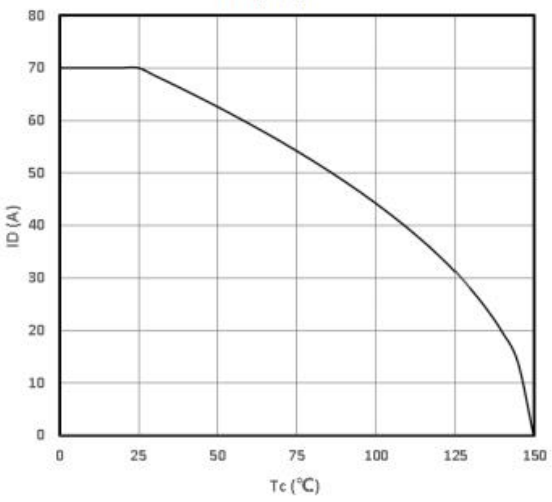
Typ. capacitances
C =f(V_{DS}); V_{GS}=0V; f =1MHz



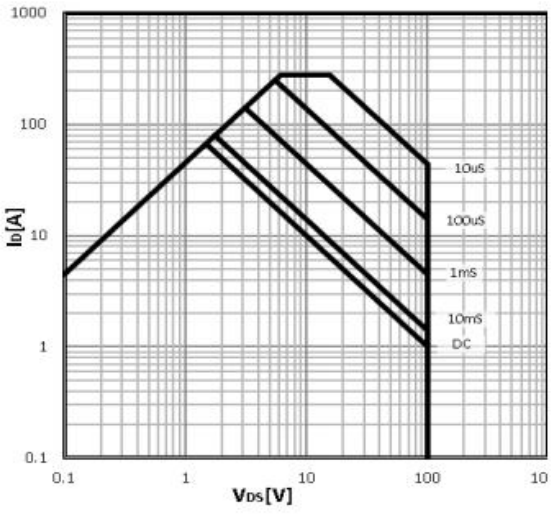
Power Dissipation
P_{tot}=f(T_C)



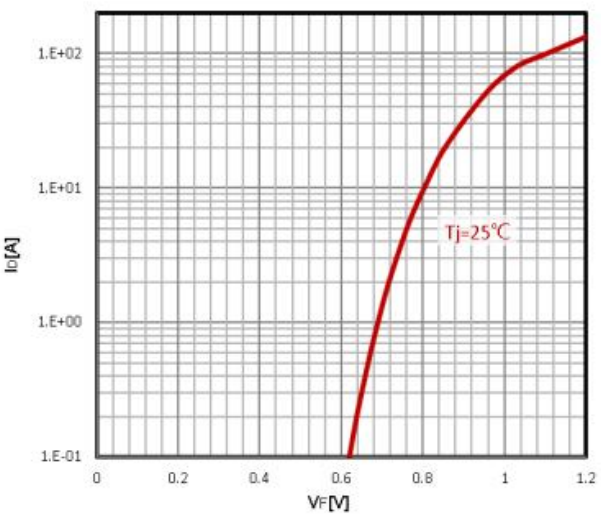
Maximum Drain Current
I_D=f(T_C)



Safe operating area
I_D=f(V_{DS})

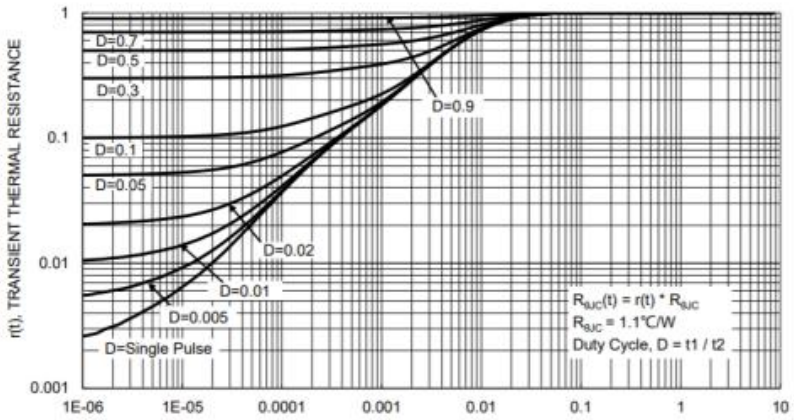


Body Diode Forward Voltage Variation
I_F=f(V_{GS})

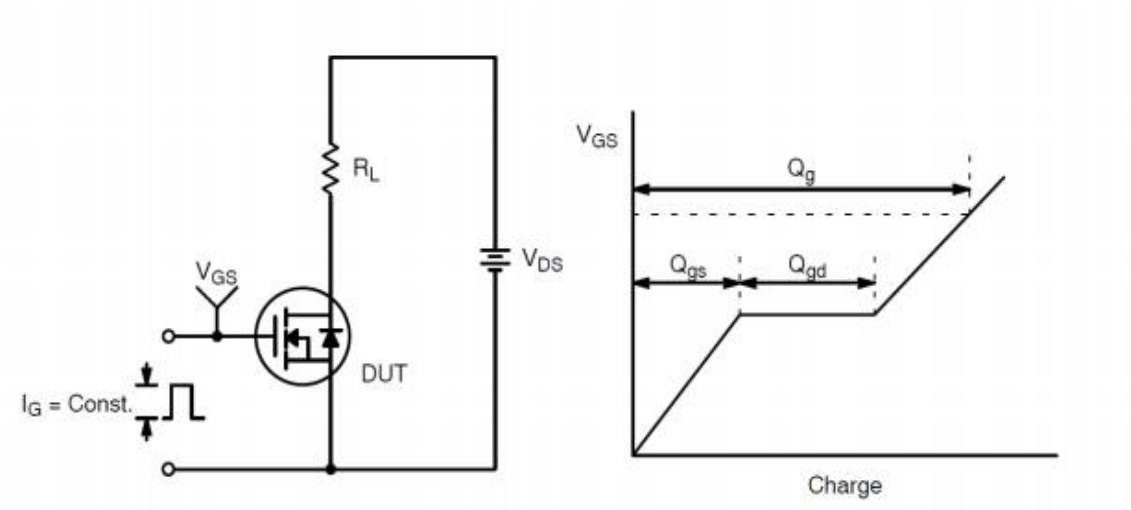


Max. transient thermal impedance

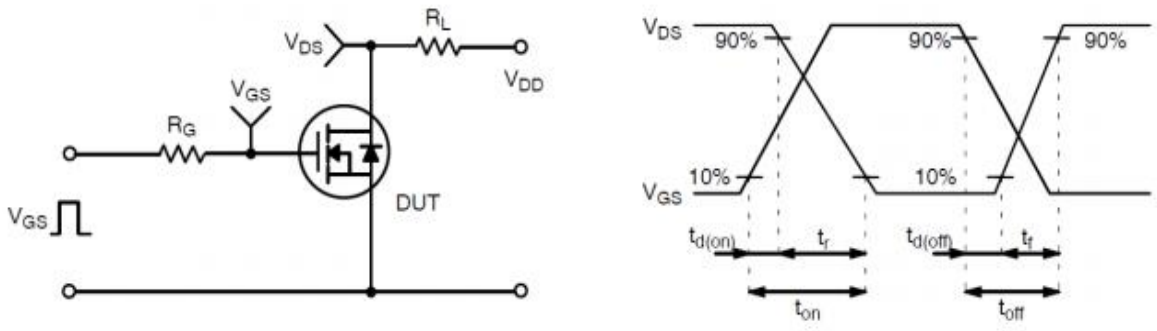
$Z_{thJC}=f(t_p)$



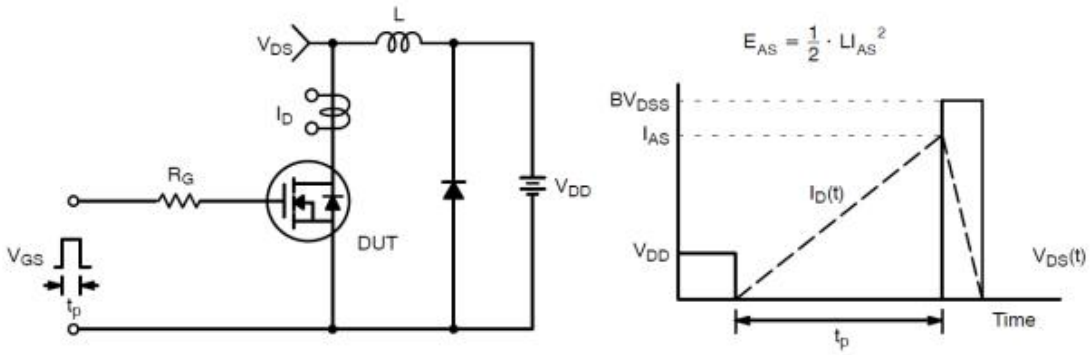
Test Circuit and Waveform



Gate Charge Test Circuit & Waveform

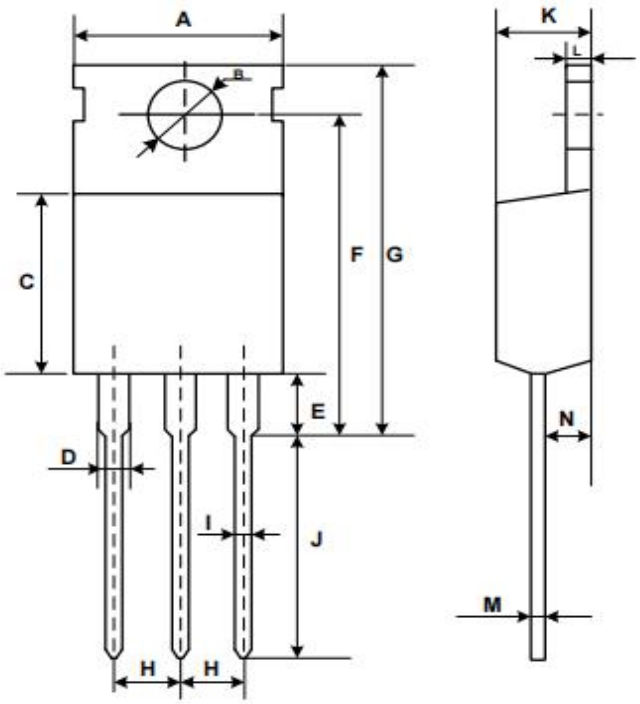


Resistive Switching Test Circuit & Waveforms



Unclamped Inductive Switching Test Circuit & Waveforms

Package Dimensions TO220



SYMBOL	MM	
	MIN	MAX
A	9.70	10.30
B	3.40	3.80
C	8.80	9.40
D	1.17	1.47
E	2.60	3.50
F	15.10	16.70
G	19.55MAX	
H	2.54REF	
I	0.70	0.95
J	9.35	11.00
K	4.30	4.77
L	1.20	1.45
M	0.40	0.65
N	2.20	2.60

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