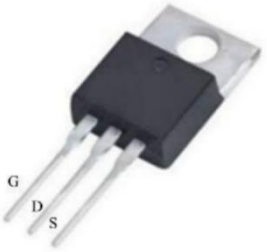
华半半导体
Huaban Semiconductor

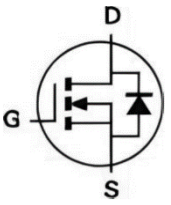
HN070T65TH

N-MOSFET 650V, 70mΩ

Key Performance Parameters		
Parameter	**Value**	**Unit**
V_{DSS}	650	V
$R_{DS(ON)max.}V_{GS}$=10V	70	mΩ
I_D	54	A
Q_G	52	nC

TO-220





Features	Application
• Fast recovery body diode • Extremely low losses • Very low FOM (Rdson×Qg) • Very high commutation ruggedness • Qualified for industrial grade applications according to JEDEC	• PC power • Server power supply. • Telecom • Solar invertor • Super charger for automobiles

Ordering Information

Ordering Code	RoHS Status	Package	Package Code	Packing
HN070T65TH	Halogen-Free	TO-220	H	Tube

Absolute Maximum Ratings (T_J=25°C unless otherwise noted)

Parameter		Symbol	Value	Unit
Drain-Source Voltage		V_{DS}	650	V
Gate-Source Voltage		V_{GS}	±30	V
Drain Current-Continuous Note1	T_C= 25°C	I_D	54	A
	T_C= 100°C		34	A
Drain Current-Pulsed	T_C= 25°C	I_{DM}	162	A
Avalanche Current		I_{AS}	6	A
Single Pulse Avalanche Energy Note2		E_{AS}	900	mJ
Maximum Power Dissipation	T_C= 25°C	P_{tot}	500	W
Storage Temperature Range		T_{STG}	-55 to 150	°C
Operating Junction Temperature Range		T_J	-55 to 150	°C

Thermal Resistance Ratings

Parameter	Conditions	Min.	Typ.	Max.	Unit
Thermal resistance, Junction-to-Ambient Note3	T_C=25°C			62	°C/W
Thermal resistance, Junction-to-Case Note3	T_C=25°C			0.25	°C/W

Notes:

1. Pulse width limited by $T_{J,MAX}$.
2. Starting T_J=25°C, V_{DD}=50V.
3. For surface-mounted devices, both R_{thJC} and R_{thJA} are measured with the device mounted on approximately 1"×1"FR-4 PCBs. In actual applications, many factors including the PCB material and layout, may affect the thermal resistance of the device-board assembly. For best results, characterize the thermal resistance directly in the application circuit.

Electrical Characteristics (T_J=25°C unless otherwise noted)

STATIC CHARACTERISTICS						
Parameter	**Symbol**	**Conditions**	**Min.**	**Typ.**	**Max.**	**Unit**
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	V_{GS}=0V, I_D=250μA	650			V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS}=650V, V_{GS}=0V			10	μA
Gate-Source Leakage Current	I_{GSS}	V_{GS}=±30V, V_{DS}=0V			±100	nA

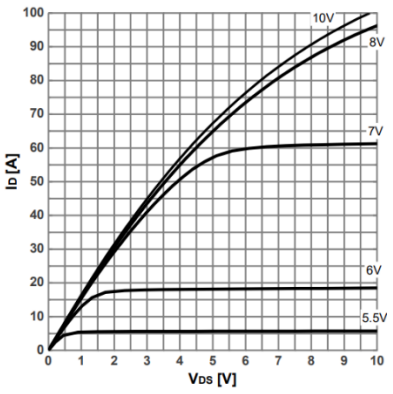
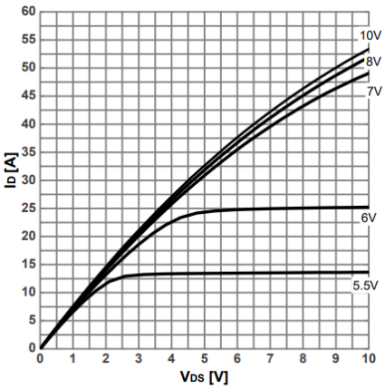
STATIC CHARACTERISTICS						
Parameter	**Symbol**	**Conditions**	**Min.**	**Typ.**	**Max.**	**Unit**
Gate Threshold Voltage	$V_{GS(TH)}$	V_{DS}=V_{GS}, I_D=250μA	3.0		5.0	V
Drain-Source On-State Resistance	$R_{DS(ON)}$	V_{GS}=10V, I_D=23A, Tj=25°C		61	70	mΩ
Gate Resistance	R_g	V_{DD}=0V, V_{GS}=0V, f=1MHz		2		Ω

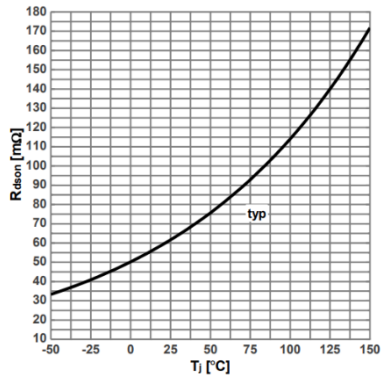
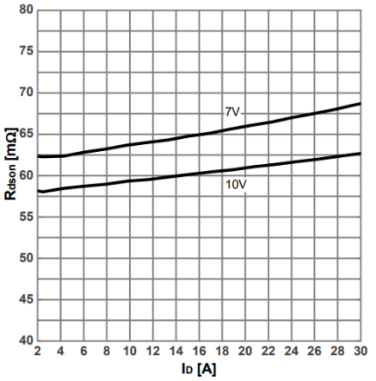
DYNAMIC CHARACTERISTICS						
Parameter	**Symbol**	**Conditions**	**Min.**	**Typ.**	**Max.**	**Unit**
Input Capacitance	C_{iss}	V_{GS}=0V, V_{DS}=50V, f=250KHz		2500		pF
Output Capacitance	C_{oss}	V_{GS}=0V, V_{DS}=50V, f=250KHz		155		pF
Reverse Transfer Capacitance	C_{rss}	V_{GS}=0V, V_{DS}=50V, f=250KHz		4		pF
Turn-On Delay Time	$T_{d(on)}$	V_{DD}=400V, V_{GS}=10V, I_D=23A		34		ns
Rise Time	t_r	V_{DD}=400V, V_{GS}=10V, I_D=23A		12		ns
Turn-Off Delay Time	$T_{d(off)}$	V_{DD}=400V, V_{GS}=10V, I_D=23A		67		ns
Fall Time	t_f	V_{DD}=400V, V_{GS}=10V, I_D=23A		11		ns

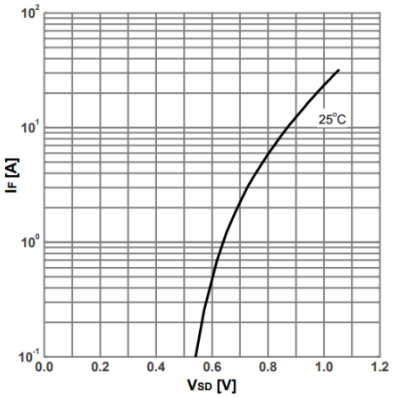
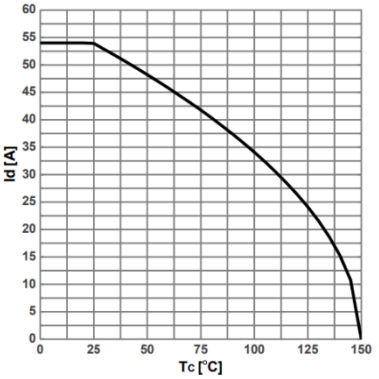
GATE CHARGECHARACTERISTICS						
Parameter	**Symbol**	**Conditions**	**Min.**	**Typ.**	**Max.**	**Unit**
Gate to Source Gate Charge	Q_{gs}	V_{DD}=400V, I_D=23A, V_{GS}=0 to 10V		17		nC
Gate to Drain Charge	Q_{gd}	V_{DD}=400V, I_D=23A, V_{GS}=0 to 10V		22		nC
Gate Charge Total	Q_G	V_{DD}=400V, I_D=23A, V_{GS}=0 to 10V		52		nC

DRAIN-SOURCE DIODE CHARACTERISTICS AND MAXIMUM RATINGS						
Parameter	**Symbol**	**Conditions**	**Min.**	**Typ.**	**Max.**	**Unit**
Diode Forward Voltage	V_{SD}	V_{GS}=0V, I_F=23A		0.99		V
Continuous Diode Forward Current	I_S	T_C=25°C			54	A
Maximum Pulsed Forward Current	I_{SM}	T_C=25°C			162	A
Body Diode Reverse Recovery Time	t_{rr}	V_R=400V, I_F=23A, di/dt=100A/μs		106		ns
Body Diode Reverse Recovery Charge	Q_{rr}	V_R=400V, I_F=23A, di/dt=100A/μs		334		nC
Reverse Recovery Current	I_{RRM}	V_R=400V, I_F=23A, di/dt=100A/μs		5.7		A

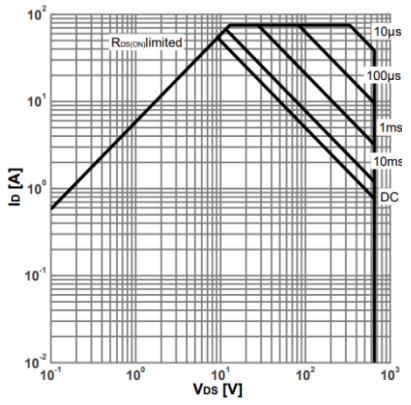
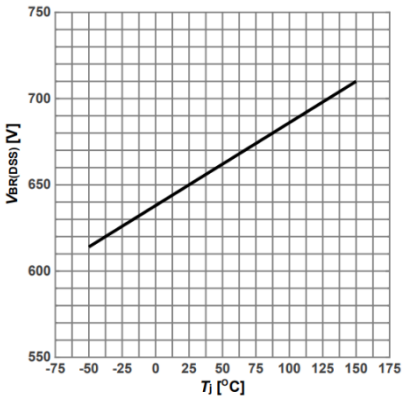
Typical Operating Characteristics

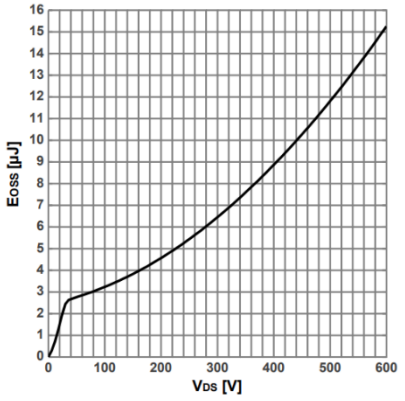
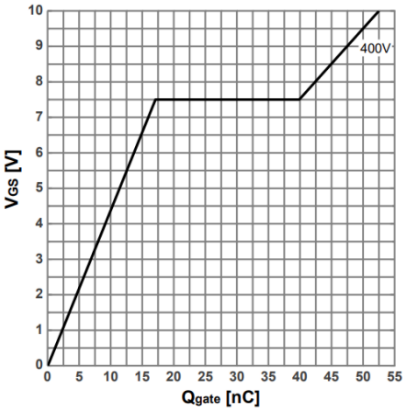
TYP.Output Characteristics T_J=25℃	TYP.Output Characteristics T_J=125℃
	

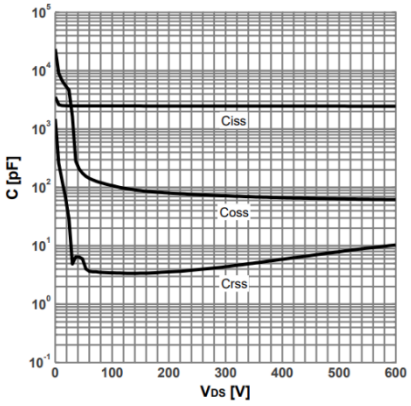
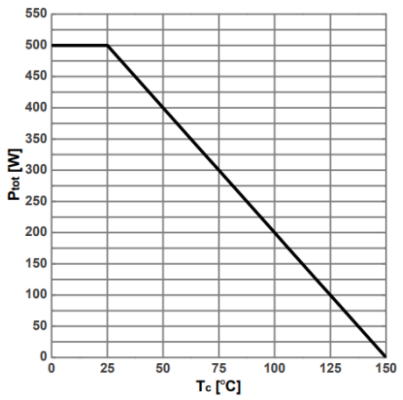
TYP.Drain-Source On-Resistance vs Junction Temperature	TYP.Drain-Source On-Resistance vs Drain Current
	

TYP.Body Diode Characteristics	TYP.Drain Current vs Case Temperature
	

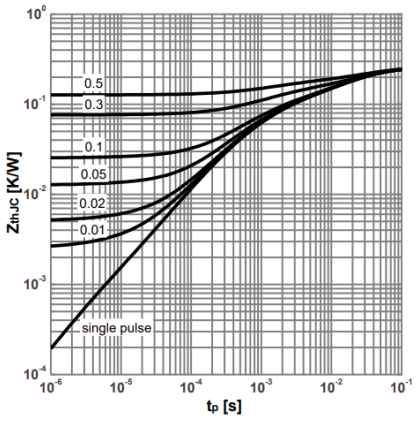
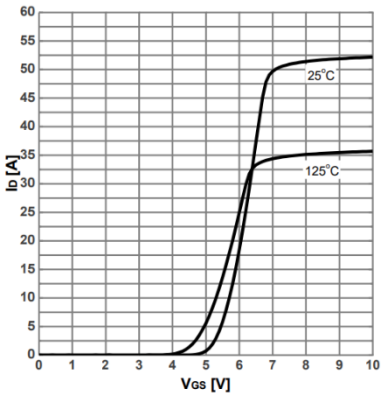
Typical Operating Characteristics

TYP.Safe Operation Area	TYP.Breakdown Voltage vs Junction Temperature
	

TYP.Coss stored energy	TYP.Gate Charge
	

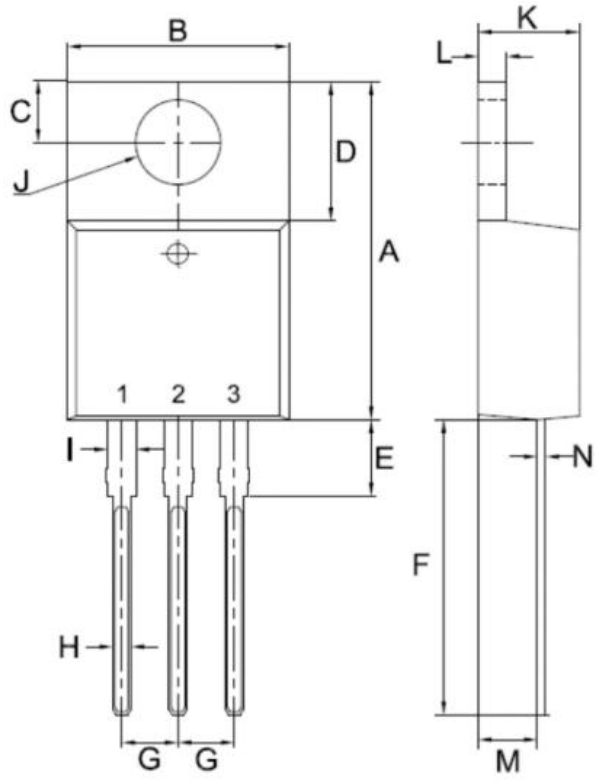
TYP.Capacitance	TYP.Power Dissipation
	

Typical Operating Characteristics

TYP.Transient Thermal Impedance	TYP.Transfer Characteristics
	

Outline

TO-220



TO-220AB Unit:mm		
DIM	MIN	MAX
A	14.80	15.40
B	9.90	10.50
C	2.50	2.90
D	6.00	6.80
E	2.95	3.95
F	12.50	14.50
G	2.34	2.74
H	0.51	1.11
I	0.97	1.57
J	3.54ϕ	4.14ϕ
K	4.27	4.87
L	1.07	1.47
M	2.39	2.99
N	0.30	0.46