

Features

- 100% EAS Guaranteed
- Green Device Available
- Super Low $R_{DS(ON)}$
- Advanced high cell density SGT MOS Technology

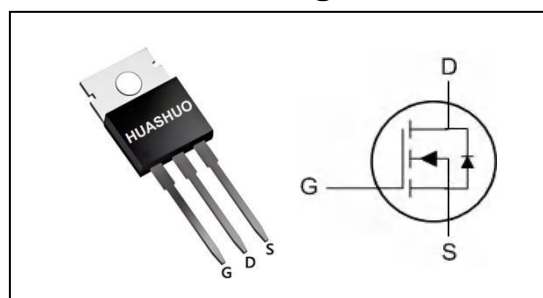
Product Summary

V_{DS}	100	V
$R_{DS(ON),typ}$	3	m Ω
I_D	180	A

Applications

- MOTOR Driver
- BMS
- High frequency switching and synchronous rectification

TO-220 Pin Configuration



Absolute Maximum Ratings

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	100	V
V_{GS}	Gate-Source Voltage	± 20	V
$I_D@T_C=25^\circ\text{C}$	Continuous Drain Current, $V_{GS} @ 10V^{1,6}$	180	A
$I_D@T_C=100^\circ\text{C}$	Continuous Drain Current, $V_{GS} @ 10V^{1,6}$	120	A
I_{DM}	Pulsed Drain Current ²	540	A
EAS	Single Pulse Avalanche Energy ³	460	mJ
I_{AS}	Avalanche Current	62	A
$P_D@T_C=25^\circ\text{C}$	Total Power Dissipation ⁴	260	W
T_{STG}	Storage Temperature Range	-55 to 150	$^\circ\text{C}$
T_J	Operating Junction Temperature Range	-55 to 150	$^\circ\text{C}$

Thermal Data

Symbol	Parameter	Typ.	Max.	Unit
$R_{\theta JA}$	Thermal Resistance Junction-Ambient ¹	---	55	$^\circ\text{C/W}$
$R_{\theta JC}$	Thermal Resistance Junction-Case ¹	---	0.5	$^\circ\text{C/W}$

N-Ch 100V Fast Switching MOSFETs
Electrical Characteristics ($T_J=25^\circ\text{C}$, unless otherwise noted)

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
BV_{DSS}	Drain-Source Breakdown Voltage	$V_{GS}=0V$, $I_D=250\mu A$	100	---	---	V
$R_{DS(ON)}$	Static Drain-Source On-Resistance ²	$V_{GS}=10V$, $I_D=30A$	---	3.0	3.5	$m\Omega$
$V_{GS(th)}$	Gate Threshold Voltage	$V_{GS}=V_{DS}$, $I_D=250\mu A$	2.0	3.0	4.0	V
I_{DSS}	Drain-Source Leakage Current	$V_{DS}=100V$, $V_{GS}=0V$, $T_J=25^\circ\text{C}$	---	---	1	μA
		$V_{DS}=100V$, $V_{GS}=0V$, $T_J=125^\circ\text{C}$	---	---	10	
I_{GSS}	Gate-Source Leakage Current	$V_{GS}=\pm 20V$, $V_{DS}=0V$	---	---	± 100	nA
R_g	Gate Resistance	$V_{DS}=0V$, $V_{GS}=0V$, $f=1\text{MHz}$	---	1.5	---	Ω
Q_g	Total Gate Charge (10V)	$V_{DS}=50V$, $V_{GS}=10V$, $I_D=20A$	---	112	---	nC
Q_{gs}	Gate-Source Charge		---	25	---	
Q_{gd}	Gate-Drain Charge		---	23	---	
$T_d(on)$	Turn-On Delay Time	$V_{DD}=50V$, $V_{GS}=10V$, $R_G=6.0\Omega$, $I_D=20A$	---	35	---	ns
T_r	Rise Time		---	44	---	
$T_d(off)$	Turn-Off Delay Time		---	125	---	
T_f	Fall Time		---	65	---	
C_{iss}	Input Capacitance	$V_{DS}=50V$, $V_{GS}=0V$, $f=1\text{MHz}$	---	7425	---	pF
C_{oss}	Output Capacitance		---	1621	---	
C_{rss}	Reverse Transfer Capacitance		---	64	---	

Diode Characteristics

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
I_S	Continuous Source Current ^{1,5}	$V_G=V_D=0V$, Force Current	---	---	120	A
V_{SD}	Diode Forward Voltage ²	$V_{GS}=0V$, $I_S=20A$, $T_J=25^\circ\text{C}$	---	---	1.0	V
t_{rr}	Reverse Recovery Time	$I_F=20A$, $dI/dt=100A/\mu s$, $T_J=25^\circ\text{C}$	---	86	---	nS
Q_{rr}	Reverse Recovery Charge		---	181	---	nC

Note :

- 1.The data tested by surface mounted on a 1 inch² FR-4 board with 2OZ copper.
- 2.The data tested by pulsed , pulse width $\leq 300\mu s$, duty cycle $\leq 2\%$
- 3.The EAS data shows Max. rating . The test condition is $V_{DD}=50V$, $V_{GS}=10V$, $L=0.5mH$, $I_{AS}=62A$
- 4.The power dissipation is limited by 150°C junction temperature
- 5.The data is theoretically the same as I_D and I_{DM} , in real applications , should be limited by total power dissipation.
- 6.Package limitation current.

Typical Characteristics

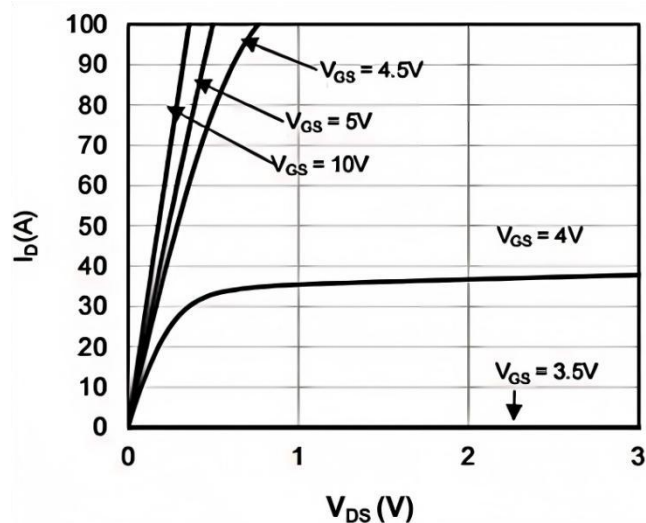


Fig.1 Typical Output Characteristics

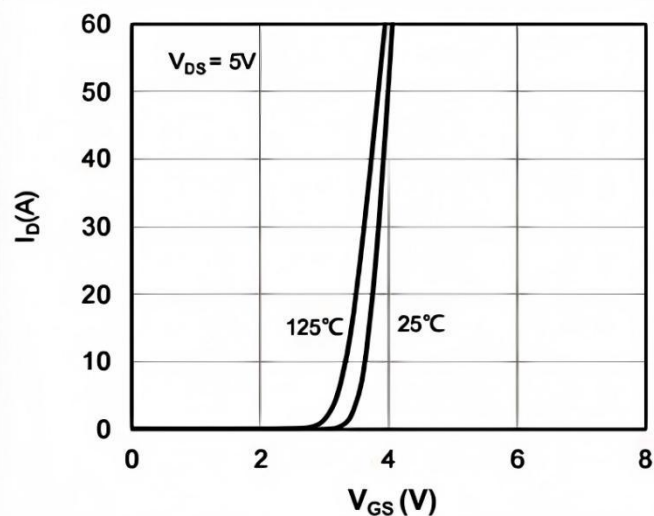


Fig.2 Transfer Characteristics

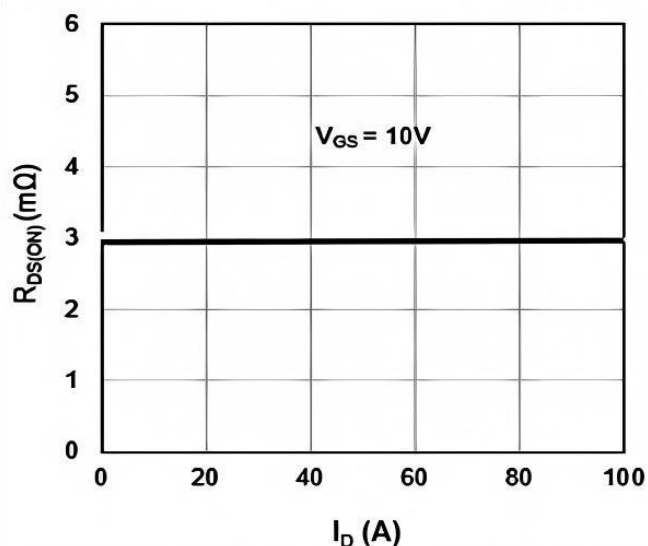


Fig.3 On-Resistance Variation vs Drain Current

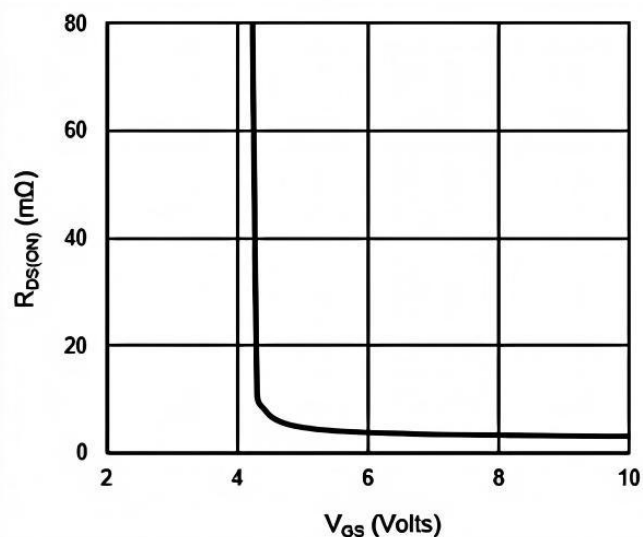


Fig.4 On-Resistance vs Gate to Source Voltage

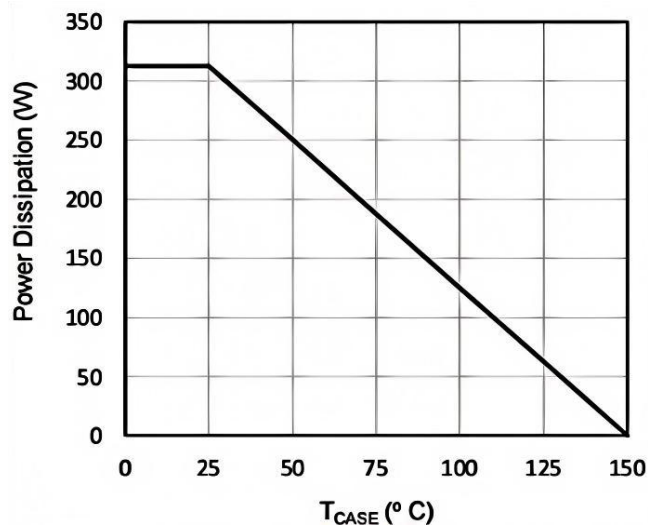


Fig.5 Power Dissipation

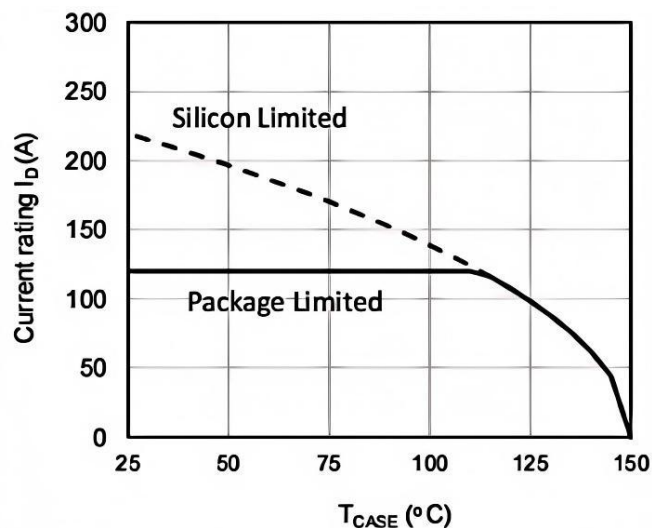


Fig.6 Drain Current Derating

N-Ch 100V Fast Switching MOSFETs

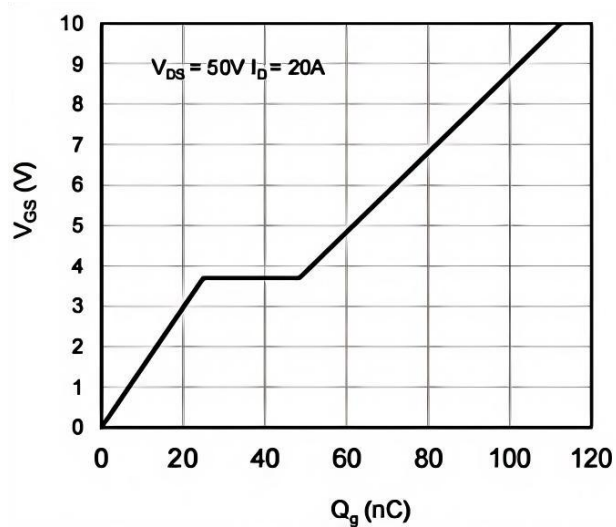


Fig.7 Gate Charge Waveforms

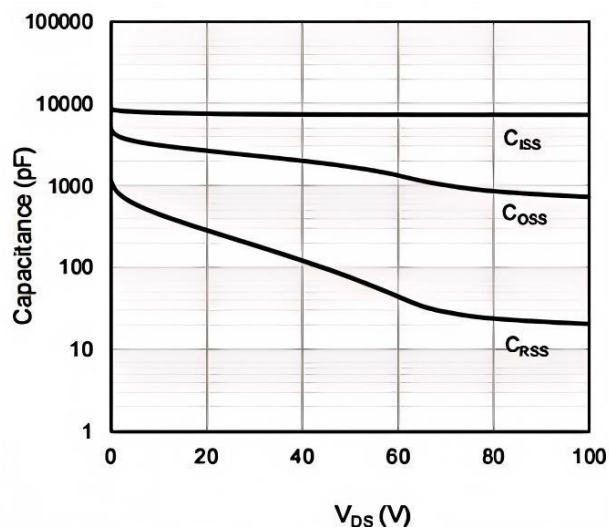


Fig.8 Capacitance

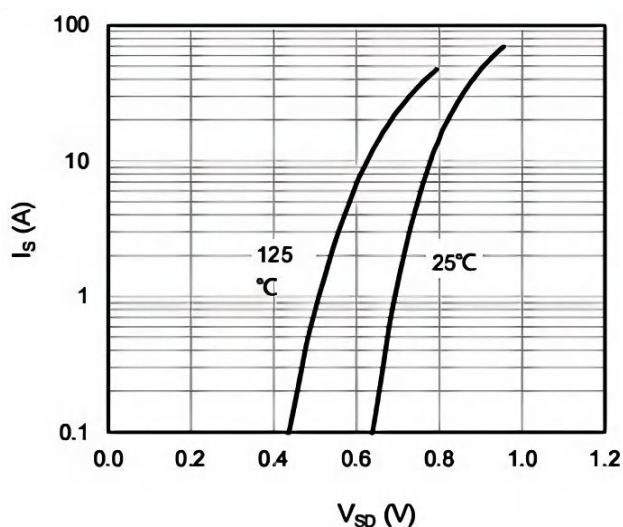


Fig.9 Body Diode Characteristics

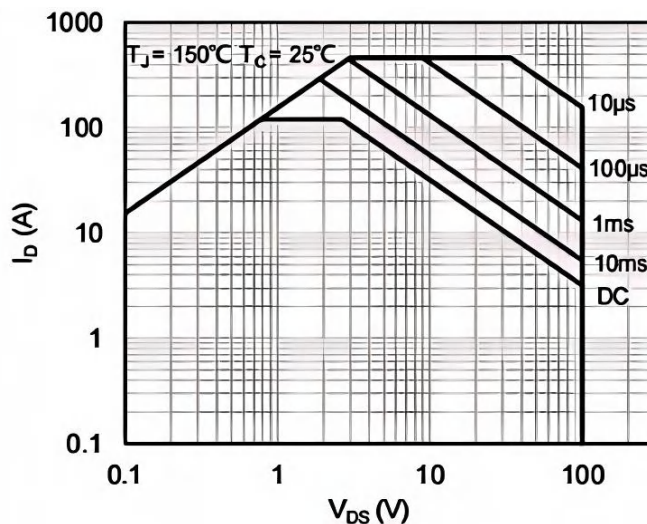


Fig.10 Maximum Safe Operating Area

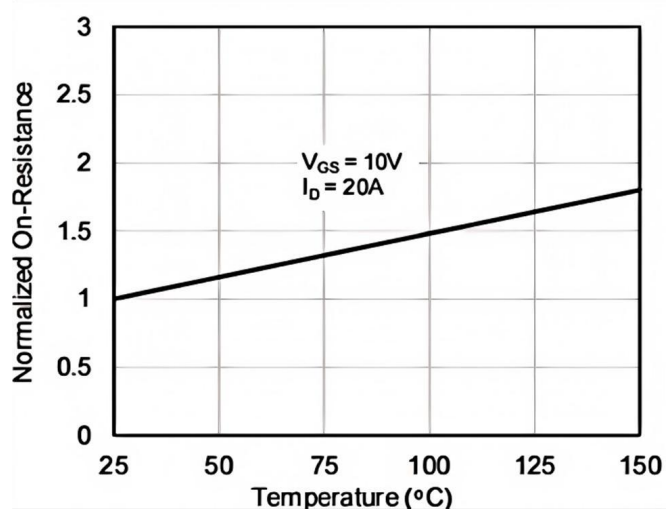


Fig.11 On-Resistance Variation vs Temperature

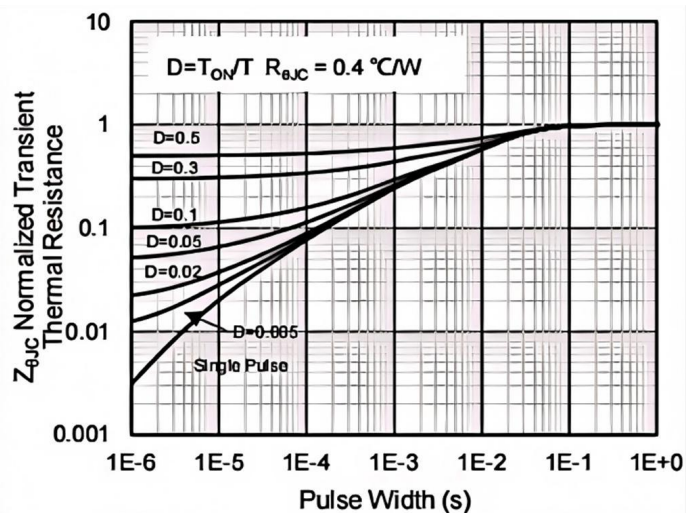
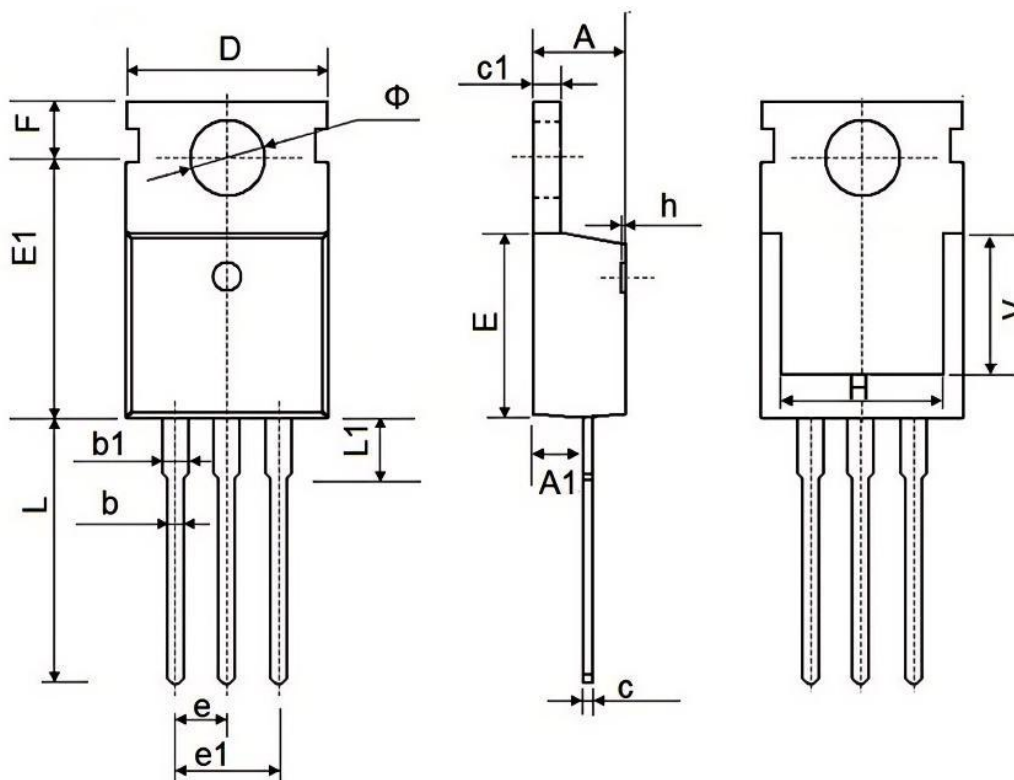


Fig.12 Transient Thermal Response Curve

Ordering Information

Part Number	Package code	Packaging
HSP0084A	TO-220	1000/Box

TO-220 Package Outline



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	4.300	4.700	0.169	0.185
A1	2.200	2.600	0.087	0.102
b	0.700	0.950	0.028	0.037
b1	1.170	1.410	0.046	0.056
C	0.450	0.650	0.018	0.026
c1	1.200	1.400	0.047	0.055
D	9.600	10.400	0.378	0.409
E	8.8500	9.750	0.348	0.384
E1	12.650	12.950	0.498	0.510
e	2.540 TYP.		0.100TYP.	
e1	4.980	5.180	0.196	0.204
F	2.650	2.950	0.104	0.116
H	7.900	8.100	0.311	0.319
h	0.000	0.300	0.000	0.012
L	12.750	14.300	0.502	0.563
L1	2.850	3.950	0.112	0.156
V	7.500 REF.		0.295 REF.	
Φ	3.400	4.000	0.134	0.157

HSP0084A Marking:

