

Features

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

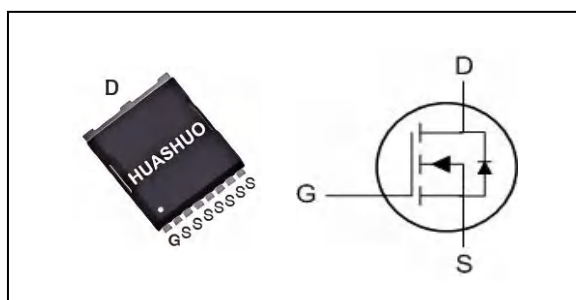
Product Summary

V_{DS}	150	V
$R_{DS(ON),typ}$	3.5	m Ω
I_D	255	A

Applications

- MOTOR Driver.
- UPS.
- Power Tools.
- Synchronous Rectification in SMPS.

TOLL Pin Configuration



Absolute Maximum Ratings

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	150	V
V_{GS}	Gate-Source Voltage	± 20	V
$I_D@T_C=25^\circ\text{C}$	Continuous Drain Current, $V_{GS} @ 10V^{1,6}$	255	A
$I_D@T_C=100^\circ\text{C}$	Continuous Drain Current, $V_{GS} @ 10V^{1,6}$	160	A
I_{DM}	Pulsed Drain Current ²	1020	A
EAS	Single Pulse Avalanche Energy ³	1300	mJ
$P_D@T_C=25^\circ\text{C}$	Total Power Dissipation ⁴	600	W
T_{STG}	Storage Temperature Range	-55 to 175	$^\circ\text{C}$
T_J	Operating Junction Temperature Range	-55 to 175	$^\circ\text{C}$

Thermal Data

Symbol	Parameter	Typ.	Max.	Unit
$R_{\theta JA}$	Thermal Resistance Junction-Ambient ¹	---	50	$^\circ\text{C/W}$
$R_{\theta JC}$	Thermal Resistance Junction-Case ¹	---	0.25	$^\circ\text{C/W}$

N-Ch 150V Fast Switching MOSFETs
Electrical Characteristics (T_J=25 °C, unless otherwise noted)

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
BV _{DSS}	Drain-Source Breakdown Voltage	V _{GS} =0V, I _D =250uA	150	---	---	V
R _{DS(ON)}	Static Drain-Source On-Resistance ²	V _{GS} =10V, I _D =20A	---	3.5	4.0	mΩ
V _{GS(th)}	Gate Threshold Voltage	V _{GS} =V _{DS} , I _D =250uA	2.0	3.0	4.0	V
I _{DSS}	Drain-Source Leakage Current	V _{DS} =120V, V _{GS} =0V, T _J =25°C	---	---	1	uA
		V _{DS} =120V, V _{GS} =0V, T _J =55°C	---	---	5	
I _{GSS}	Gate-Source Leakage Current	V _{GS} =±20V, V _{DS} =0V	---	---	±100	nA
R _g	Gate Resistance	V _{DS} =0V, V _{GS} =0V, f=1MHz	---	4.9	---	Ω
Q _g	Total Gate Charge (10V)	V _{DS} =75V, V _{GS} =10V, I _D =20A	---	128	---	nC
Q _{gs}	Gate-Source Charge		---	83	---	
Q _{gd}	Gate-Drain Charge		---	44	---	
T _{d(on)}	Turn-On Delay Time	V _{DD} =75V, V _{GS} =10V, R _G =4.5Ω, R _L =1Ω, I _D =20A	---	33	---	ns
T _r	Rise Time		---	68	---	
T _{d(off)}	Turn-Off Delay Time		---	85	---	
T _f	Fall Time		---	41	---	
C _{iss}	Input Capacitance	V _{DS} =75V, V _{GS} =0V, f=1MHz	---	8660	---	pF
C _{oss}	Output Capacitance		---	720	---	
C _{rss}	Reverse Transfer Capacitance		---	28	---	

Diode Characteristics

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
V _{SD}	Diode Forward Voltage ²	V _{GS} =0V, I _S =50A, T _J =25°C	---	---	1.1	V
t _{rr}	Reverse Recovery Time	I _F =15A, dI/dt=100A/μs, T _J =25°C	---	118	---	nS
Q _{rr}	Reverse Recovery Charge		---	431	---	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 ≤ 300us , duty cycle ≤ 2%
- 3.The power dissipation is limited by 150°C junction temperature
- 4.The EAS data shows Max. rating . The test condition is V_{DD}=75V, V_{GS}=10V, L=0.3mH, I_{AS} = 75A.
- 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

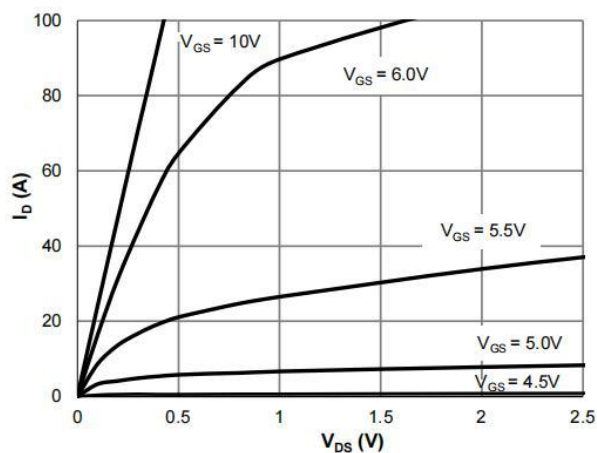


Figure 1: Saturation Characteristics

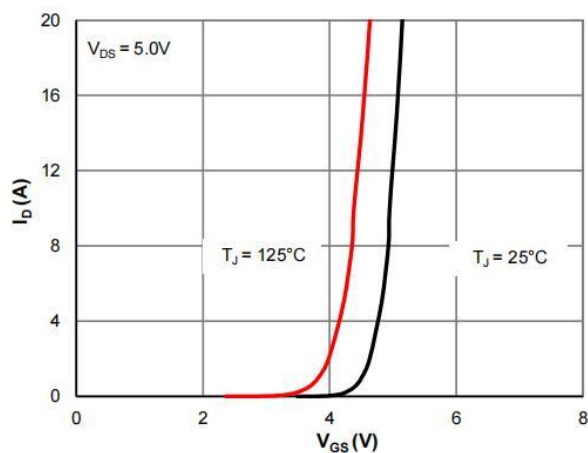


Figure 2: Transfer Characteristics

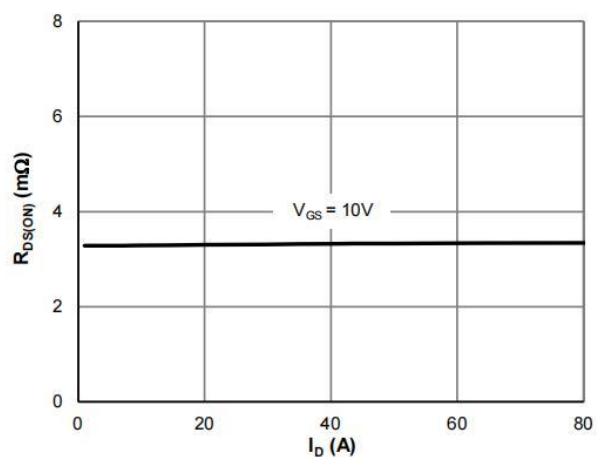


Figure 3: $R_{DS(ON)}$ vs. Drain Current

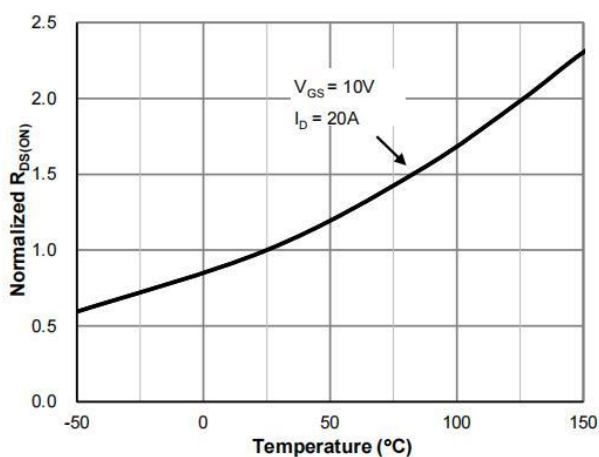


Figure 4: $R_{DS(ON)}$ vs. Junction Temperature

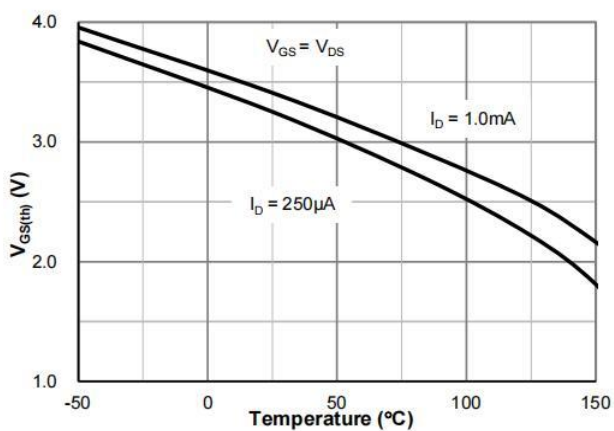


Figure 5: $V_{GS(th)}$ vs. Junction Temperature

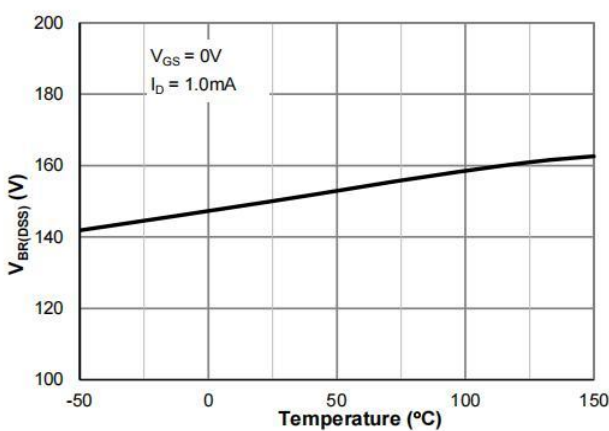


Figure 6: $V_{BR(DSS)}$ vs. Junction Temperature

N-Ch 150V Fast Switching MOSFETs

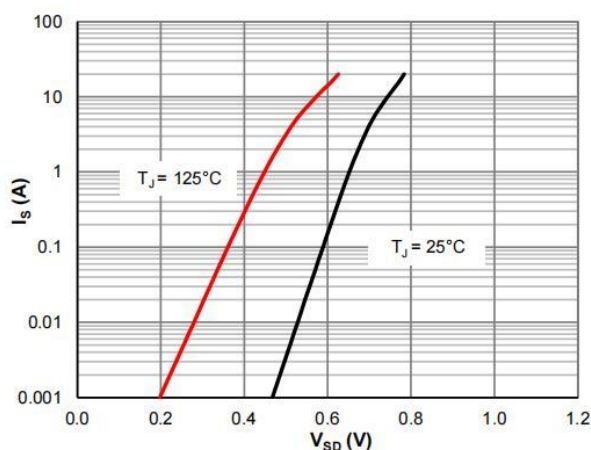


Figure 7: Body-Diode Characteristics

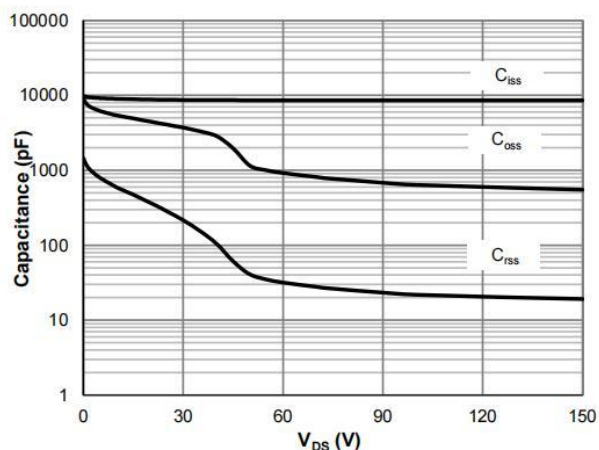


Figure 8: Capacitance Characteristics

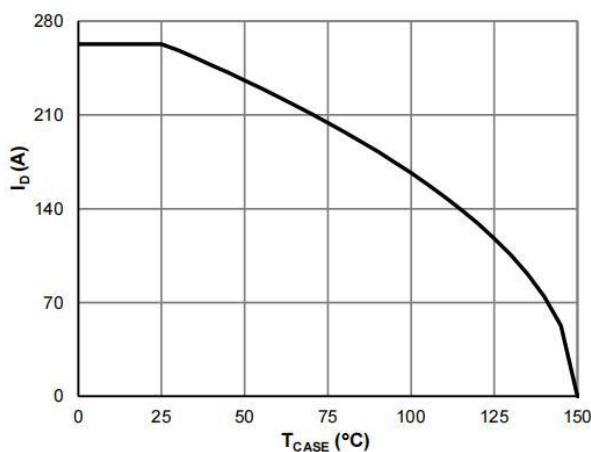


Figure 9: Current De-rating

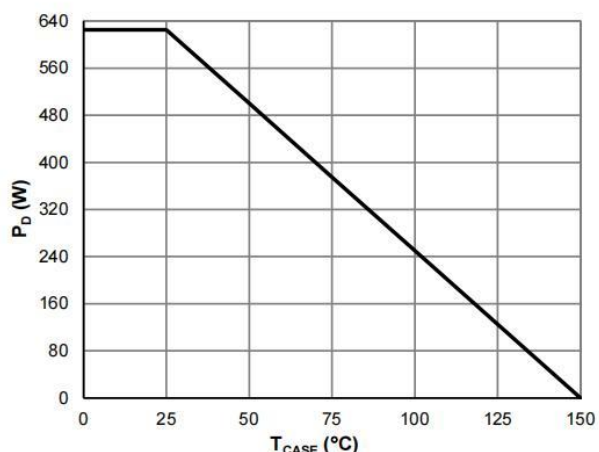


Figure 10: Power De-rating

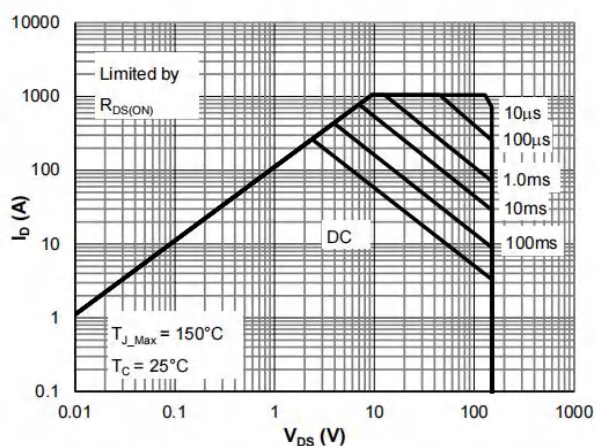


Figure 11: Maximum Safe Operating Area

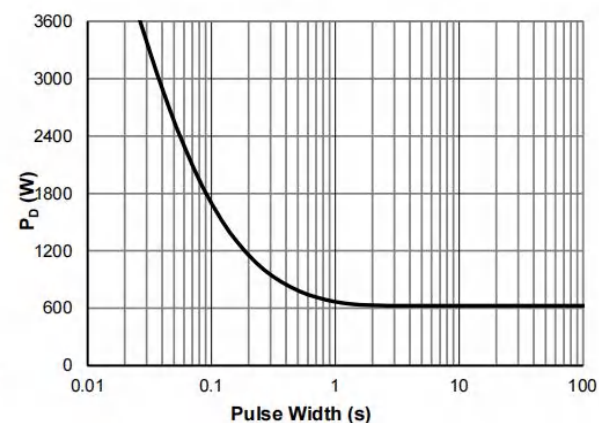


Figure 12: Single Pulse Power Rating, Junction-to-Case

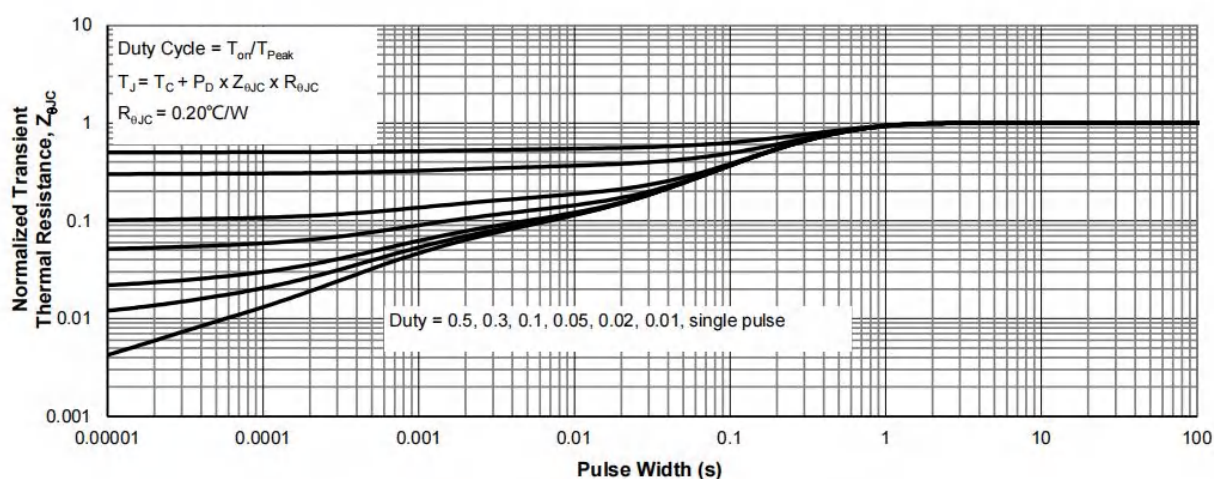
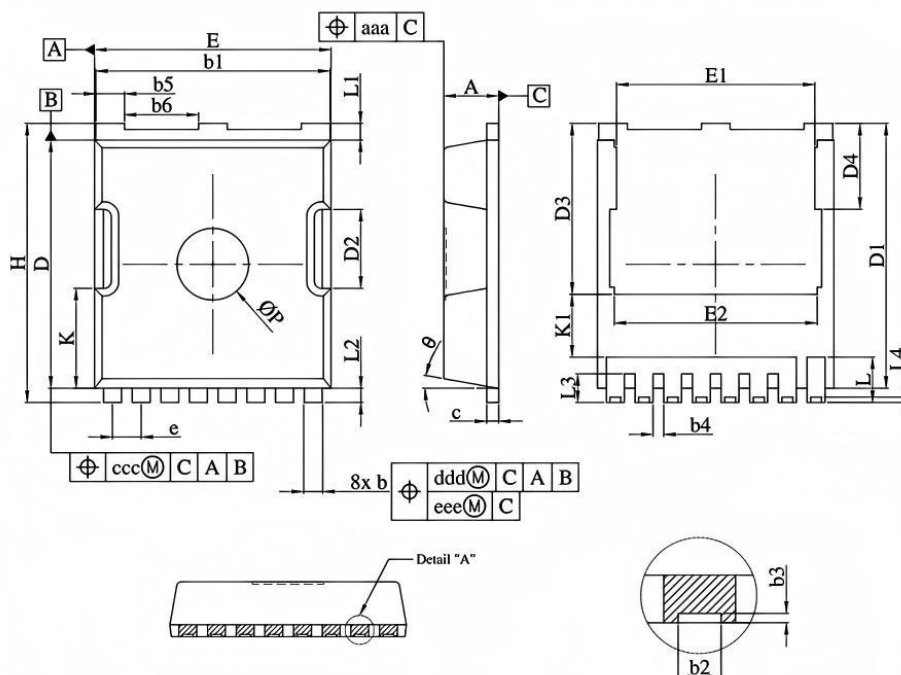


Figure 13: Normalized Maximum Transient Thermal Impedance

Ordering Information

Part Number	Package code	Packaging
HSY1502	TOLL	2000/Tape&Reel

TOLL Package Outline



COMMON DIMENSIONS(MM)							
SYMBOL	MIN.	NOMINAL	MAX.	SYMBOL	MIN.	NOMINAL	MAX.
A	2.20	2.30	2.40	E1	8.20	8.30	8.40
b	0.70	0.80	0.90	E2	8.35	8.50	8.65
b1	9.70	9.80	9.90	H	11.50	11.68	11.85
b2	0.36	0.45	0.55	K	4.08	4.18	4.28
b3	0.05	0.100	0.35	K1	2.45	---	---
b4	0.30	0.40	0.50	L	1.60	1.90	2.10
b5	1.10	1.20	1.30	L1	0.50	0.70	0.90
b6	3.00	3.10	3.20	L2	0.50	0.60	0.70
C	0.40	0.50	0.60	L3	1.00	1.20	1.30
D	10.28	10.38	10.55	L4	0.13	0.23	0.33
D1	10.98	11.08	11.18	P	2.85	3.00	3.15
D2	3.20	3.30	3.40	θ	10°REF		
D3	7.00	7.15	7.30	aaa	0.20		
D4	3.44	3.59	3.74	ccc	0.20		
e	1.10	1.20	1.30	ddd	0.25		
E	9.80	9.90	10.00	eee	0.20		

HSY1502 Marking:

