

Features

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

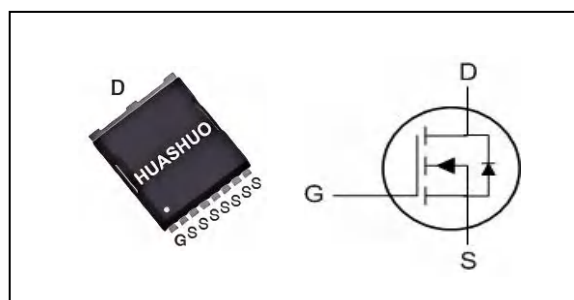
Product Summary

V_{DS}	100	V
$R_{DS(ON),typ}$	1.25	m Ω
I_D	300	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	100	V
V_{GS}	Gate-Source Voltage	± 20	V
$I_D@T_C=25^\circ\text{C}$	Continuous Drain Current, $V_{GS} @ 10V^{1,6}$	300	A
$I_D@T_C=100^\circ\text{C}$	Continuous Drain Current, $V_{GS} @ 10V^{1,6}$	265	A
I_{DM}	Pulsed Drain Current ²	1200	A
EAS	Single Pulse Avalanche Energy ³	2800	mJ
$P_D@T_C=25^\circ\text{C}$	Total Power Dissipation ⁴	500	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	---	40	$^\circ\text{C/W}$
$R_{\theta JC}$	Thermal Resistance Junction-Case ¹	---	0.25	$^\circ\text{C/W}$

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	$V_{GS}=10V, I_D=50A$	---	1.25	1.7	$m\Omega$
		$V_{GS}=6V, I_D=50A$	---	2.2	4	
$V_{GS(th)}$	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	$V_{DS}=80V, V_{GS}=0V, T_J=25^\circ\text{C}$	---	---	1	μA
		$V_{DS}=80V, V_{GS}=0V, T_J=125^\circ\text{C}$	---	---	100	
I_{GSS}	Gate-Source Leakage Current	$V_{GS}=\pm 20V, V_{DS}=0V$	---	---	± 100	nA
Qg	Total Gate Charge (10V)	$V_{DS}=50V, V_{GS}=10V, I_D=50A$	---	160	---	nC
Qgs	Gate-Source Charge		---	70	---	
Qgd	Gate-Drain Charge		---	60	---	
Td(on)	Turn-On Delay Time	$V_{DD}=50V, V_{GS}=10V, R_G=4.5\Omega, R_L=1\Omega, I_D=50A$	---	40	---	ns
Tr	Rise Time		---	128	---	
Td(off)	Turn-Off Delay Time		---	150	---	
Tf	Fall Time		---	118	---	
Ciss	Input Capacitance	$V_{DS}=50V, V_{GS}=0V, f=1\text{MHz}$	---	11370	---	pF
Coss	Output Capacitance		---	1720	---	
Crss	Reverse Transfer Capacitance		---	188	---	

Diode Characteristics

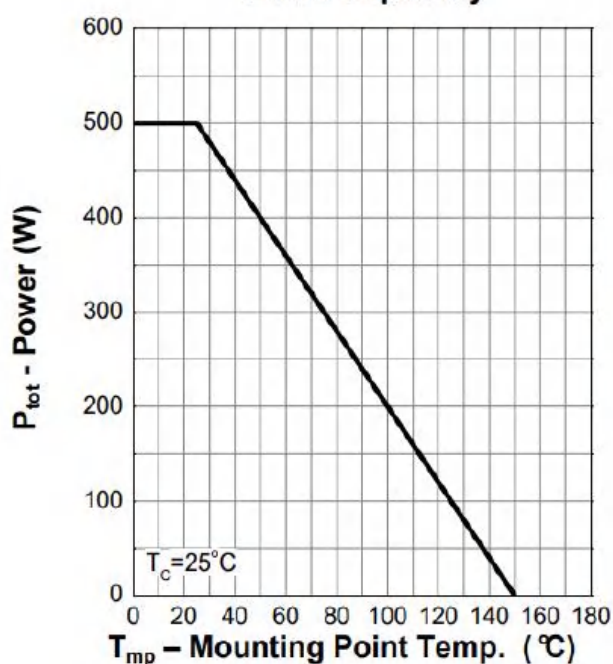
Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
V_{SD}	Diode Forward Voltage ²	$V_{GS}=0V, I_S=50A, T_J=25^\circ\text{C}$	---	---	1.1	V

Note :

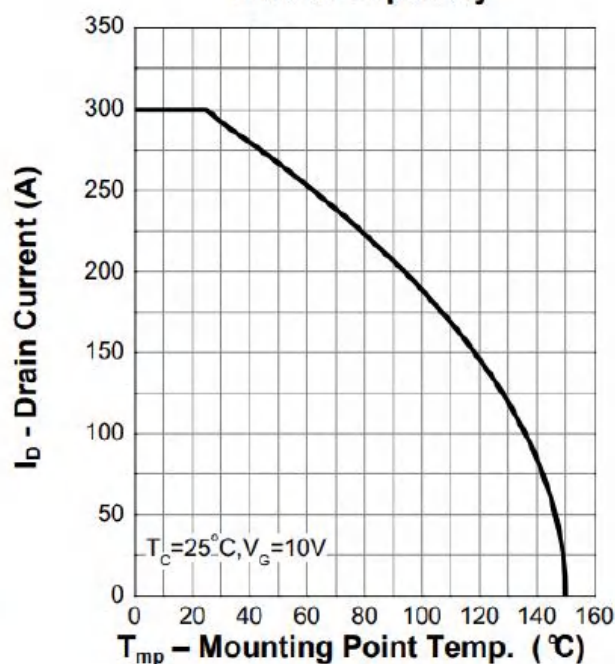
- 1.The data tested by surface mounted on a 1 inch² FR-4 board with 20Z copper.
- 2.The data tested by pulsed , pulse width $\leq 300\mu s$, duty cycle $\leq 2\%$
- 3.The power dissipation is limited by 150°C junction temperature
- 4.The data is theoretically the same as I_D and I_{DM} , in real applications , should be limited by total power dissipation.
- 5.Package limitation current.

Typical Characteristics

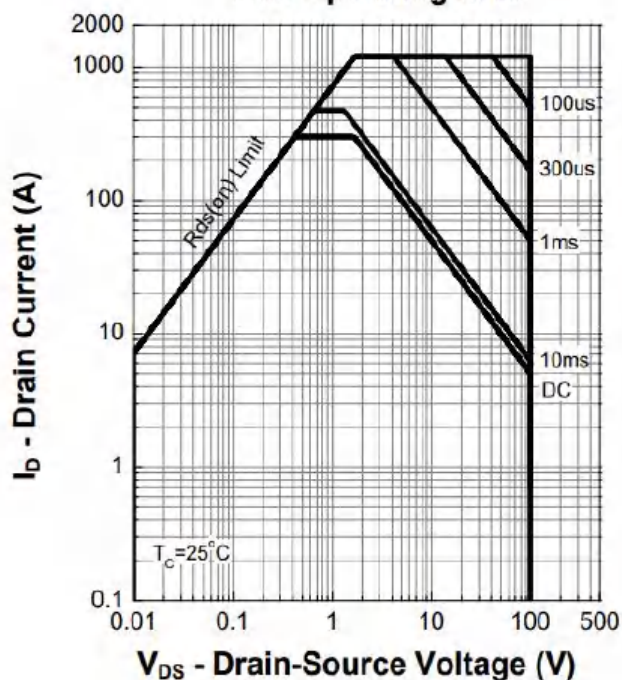
Power Capability



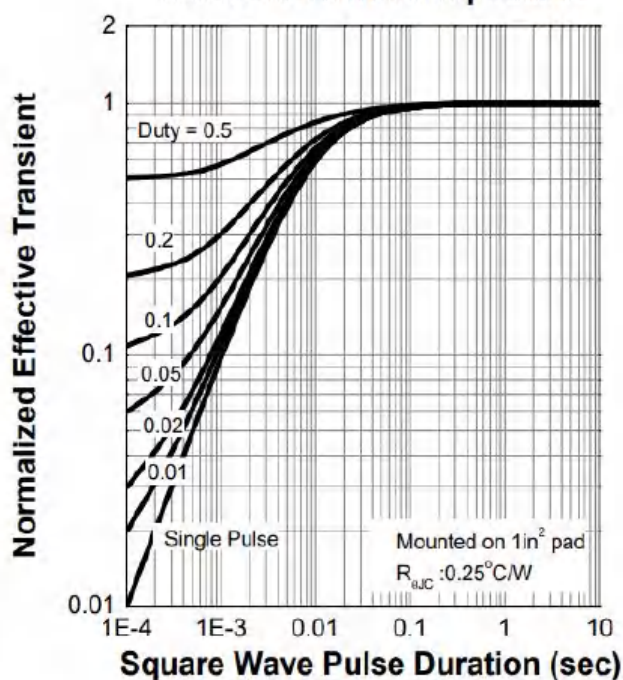
Current Capability



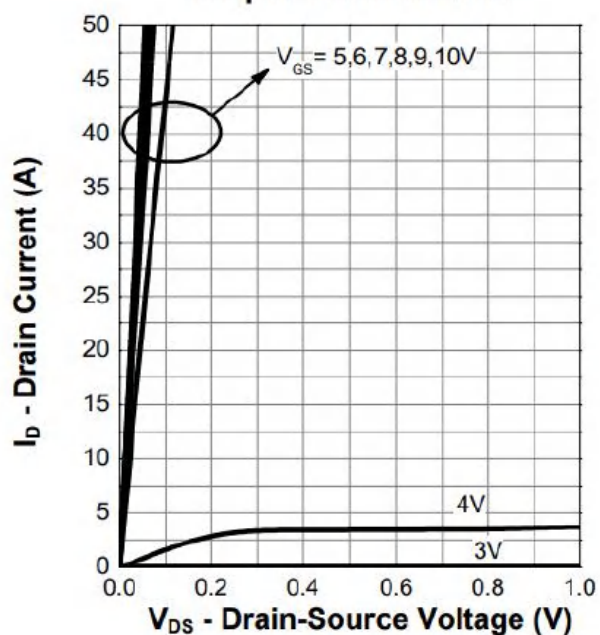
Safe Operating Area



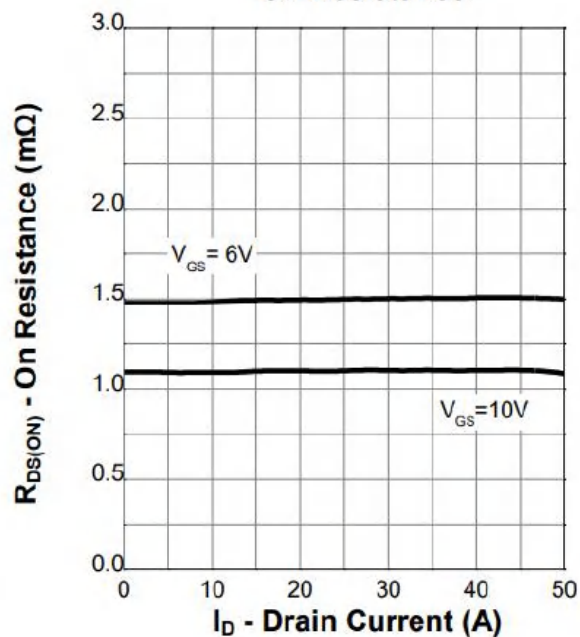
Transient Thermal Impedance



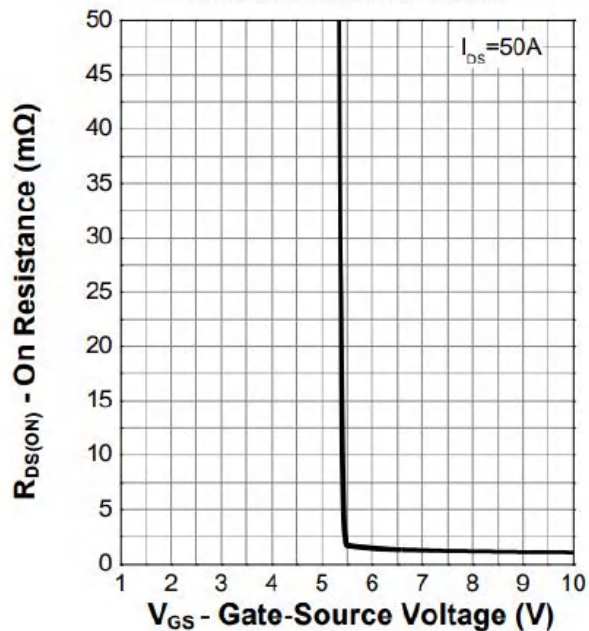
Output Characteristics



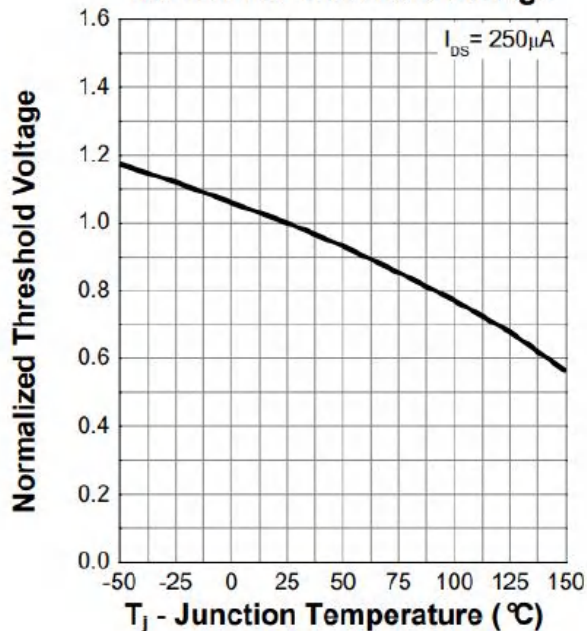
On Resistance



Transfer Characteristics

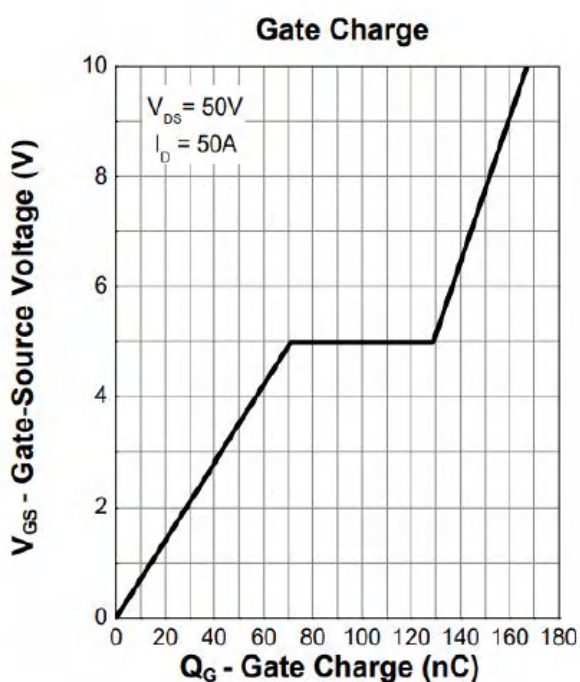
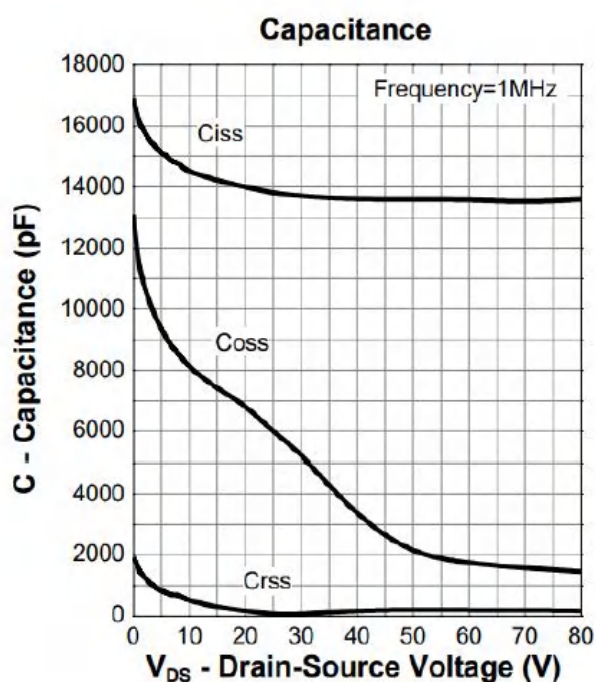
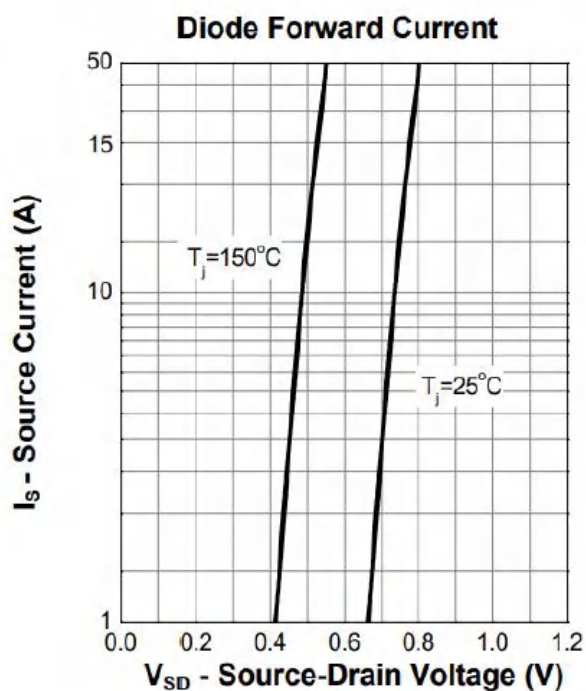
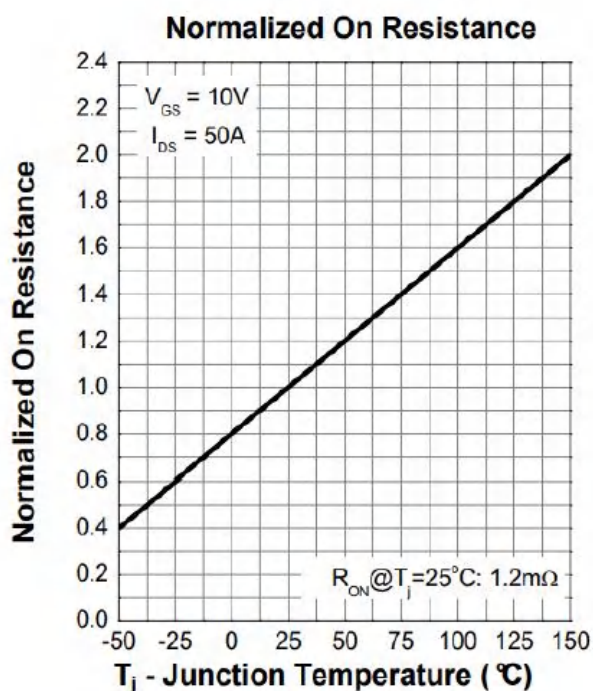


Normalized Threshold Voltage





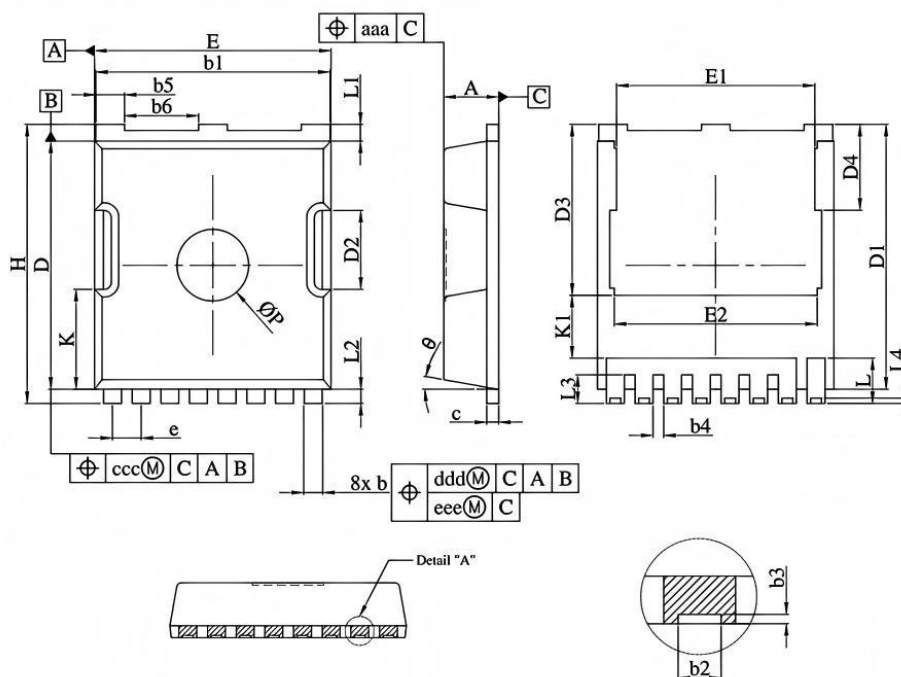
N-Ch 100V Fast Switching MOSFETs



Ordering Information

Part Number	Package code	Packaging
HSY012N10	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		