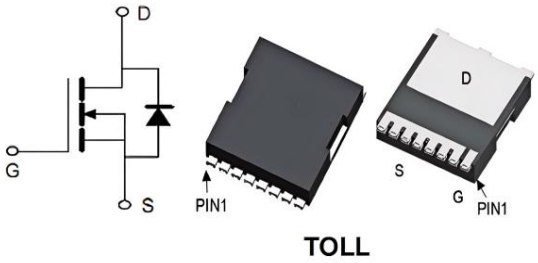
N-Channel Super Junction MOSFET

Parameter	Value	Unit
V_{DS}	650	V
$R_{DS(on)}$	72	mΩ
I_D	50	A



Features

- Multi-layer Epitaxial Chip Technology
- Ultra-fast body diode
- 100% avalanche tested

Applications

- Solar inverter / ESS / UPS
- Charger
- Power Supply

Maximum Rated Values(Ta=25℃ unless otherwise noted)

Parameter	Symbol	Value	Unit
Drain-Source Voltage	V_{DS}	650	V
Gate-Source Voltage	V_{GS}	±30	V
Continuous Drain Current1 (Tc=25℃)	I_D	50	A
Continuous Drain Current1 (Tc=100℃)	I_D	31	A
Pulsed Drain Current	I_{DM}	200	A
Single Pulse Avalanche Energy	E_{AS}	1500	mJ
Power Dissipation (Tc=25℃)	P_D	300	W
Storage Temperature Range	T_{STG}	-55 to 150	℃
Operating Junction Temperature Range	T_J	-55 to 150	℃

Thermal Data

Parameter	Symbol	Typ.	Max.	Unit
Thermal Resistance Junction-ambient	$R_{\theta JA}$	--	94	℃/W
Thermal Resistance Junction-case	$R_{\theta JC}$	--	0.42	℃/W

Electrical Characteristics (at T_J=25℃ unless otherwise specified)

Parameter	Symbol	Test Condition	Min	Typ	Max	Unit
Drain-Source Breakdown Voltage	BV_{DSS}	I_D=250μA, V_{GS}=0V	650	--	--	V
Drain Cut-Off Current	I_{DSS}	V_{DS}=650V, V_{GS}=0V	--	--	10	μA
Gate Leakage Current	I_{GSS}	V_{GS}=±30V, V_{DS}=0V	--	--	±0.25	
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS}=V_{GS}, I_D=250μA	3	--	5	V
Drain-Source ON Resistance	$R_{DS(ON)}$	V_{GS}=10V, I_D=20A	--	72	80	mΩ
Forward Transconductance	gfs	V_{DS}=10V ,I_D=20A	--	21	--	S
Gate Resistance	R_g	V_{DS}=0V ,V_{GS}=0V ,f=1MHz	--	7	--	Ω
Input Capacitance	C_{iss}	V_{DS}=100V, V_{GS}=0V, f =1.0MHz	-	2450	-	pF
Output Capacitance	C_{oss}		-	130	-	
Reverse Transfer Capacitance	C_{rss}		-	4	-	
Total Gate Charge	Q_g	V_{DS}=480V , V_{GS}=10V , I_D=21.5A	-	76	-	nC
Gate-Source Charge	Q_{gs}		-	21	-	
Gate-Drain Charge	Q_{gd}		-	43	-	
Turn-On Delay Time	$t_{d(on)}$	V_{DD}=400V ,I_D=21.5A R_G=27Ω , V_{GS}=10V	-	83	-	nS
Rise Time	t_r		-	105	-	
Turn-Off Delay Time	$t_{d(off)}$		-	243	-	
Fall Time	t_f		-	98	-	

Diode Characteristics

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Continuous Source Current	I_S	V_G=V_D=0V ,Force Current	--	--	50	A
Pulsed Source Current	I_{SM}		--	--	200	A
Diode Forward Voltage	V_{SD}	V_{GS}=0V ,I_S=40A ,T_J=25℃	--	1	1.5	V
Reverse Recovery Time	t_{rr}	di/dt=100A/μs V_{DD}=400V ,I_{SD}=21.5A	--	160	--	ns
Reverse Recovery Charge	Q_{rr}		--	0.66	--	μC

Note :

1.The EAS data shows Max.rating.The test condition is VDD=100V,VGS=10V,L=30mH ,IAS=10A.

Typical Characteristics

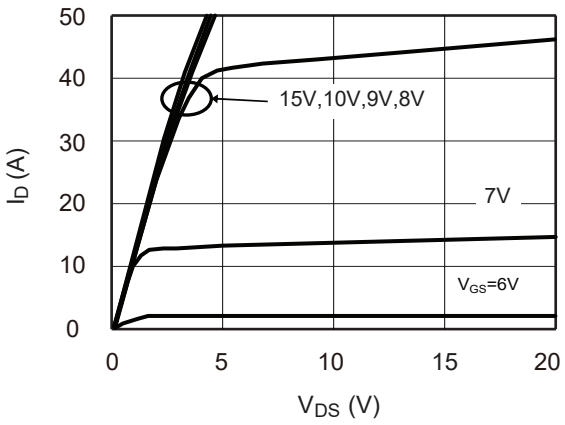


Fig 1. Output Characteristics

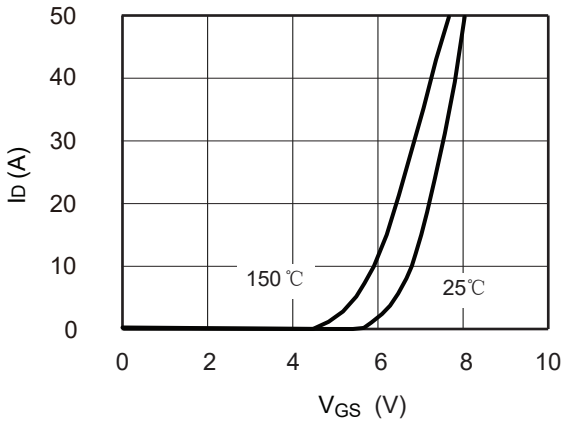


Fig 2. transfer characteristics

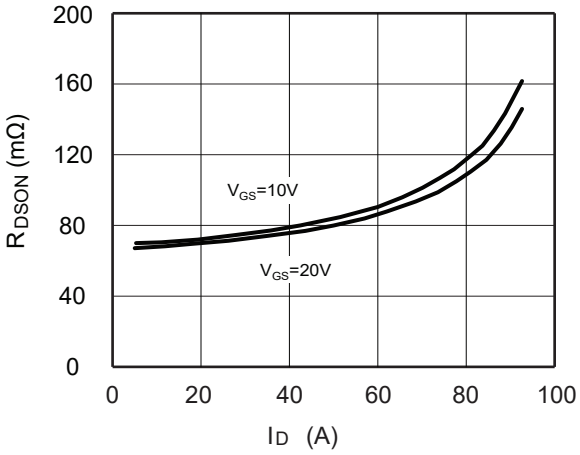


Fig 3. On-Resistance vs. Drain Current

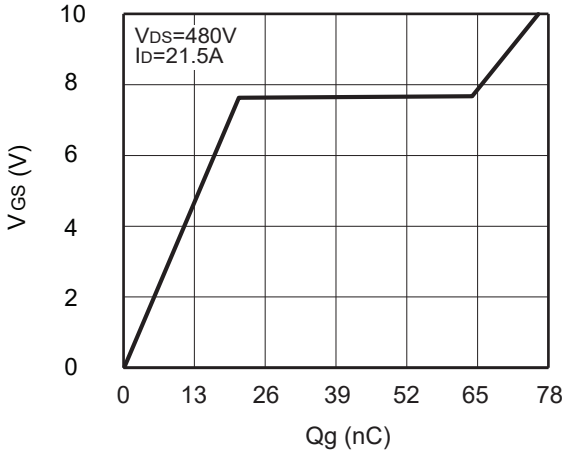


Fig 4. Gate charge vs gate-source voltage

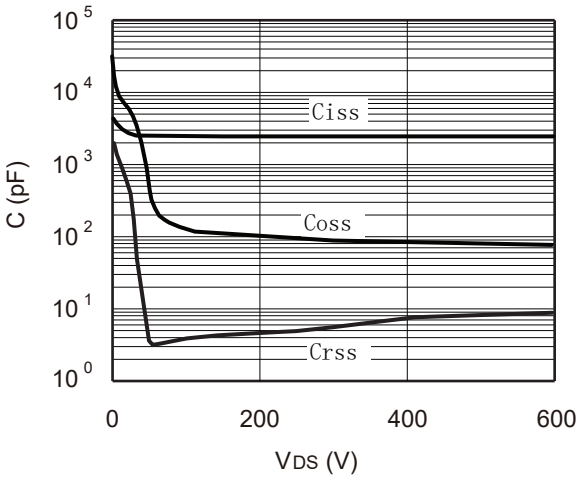


Fig 5. Capacitance Characteristics

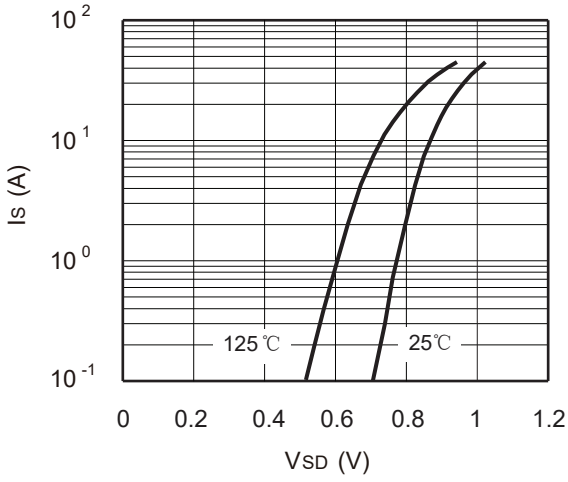


Fig 6. Body-Diode Characteristics

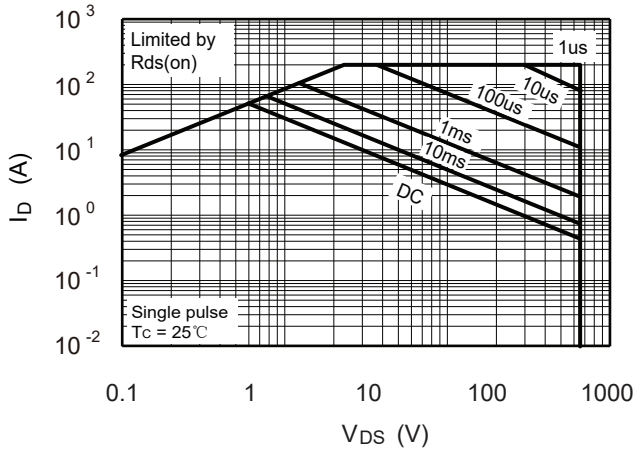


Fig 7. Safe Operating Area

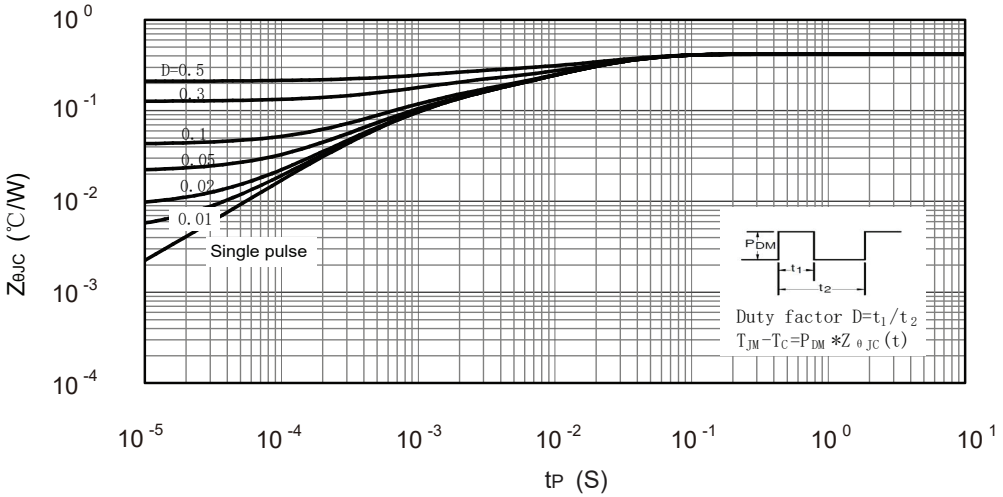
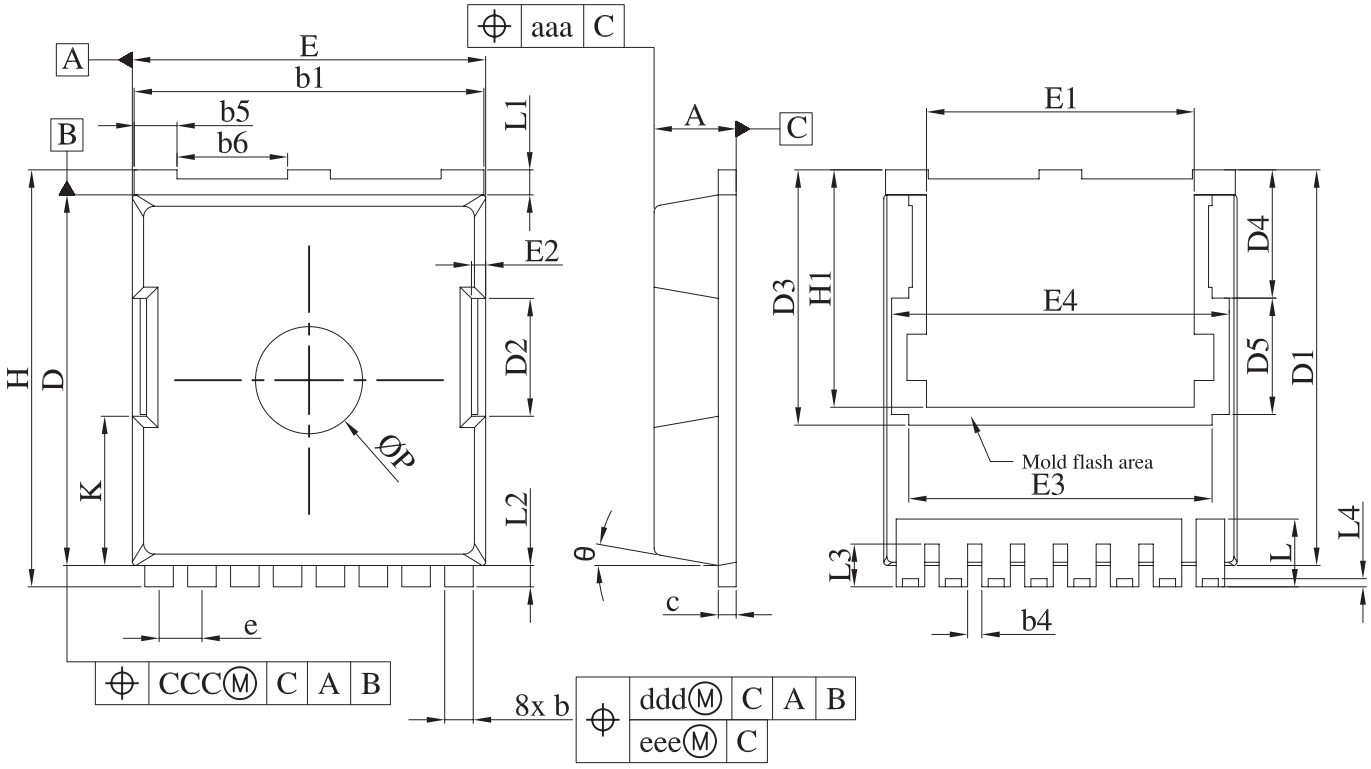
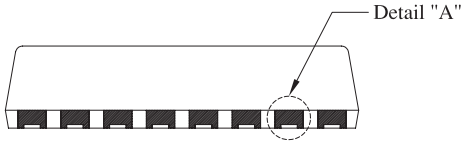


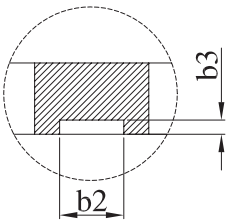
Fig 8. Transient thermal impedance

Package Outline (Unit :mm)

TOLL-8







SYMBOL		A	b	b1	b2	b3	b4	b5	b6	c	D	D1	D2	D3	D4	D5	e	E	E1
MILLIMETER	MIN.	2.2	0.7	9.7	0.36	0.05	0.3	1.1	3	0.4	10.28	10.98	3.2	7.15	3.59	3.26	1.1	9.8	7.4
	TYP.	2.3	0.8	9.8	0.45	0.1	0.4	1.2	3.1	0.5	10.38	11.08	3.3				1.2	9.9	7.5
	MAX.	2.4	0.9	9.9	0.55	/	0.5	1.3	3.2	0.6	10.55	11.18	3.4				1.3	10	7.6
SYMBOL		E2	E3	E4	H	H1	K	L	L1	L2	L3	L4	P	θ	aaa	ccc	ddd	eee	
MILLIMETER	MIN.	0.3	8.5	9.46	11.5	6.55	4.08	1.6	0.5	0.5	1	0.13	2.85	10° REF	0.2	0.2	0.25	0.2	
	TYP.	0.4			11.68	6.65	4.18	1.9	0.7	0.6	1.2	0.23	3						
	MAX.	0.5			11.85	6.75	4.28	2.1	0.9	0.7	1.3	0.33	3.15						

***Important Usage Information and Disclaimer**

The specifications of Zhuhai Hypersemi Co., Ltd. products are not guarantees of product characteristics. They reflect typical performance expected in standard applications, which may vary with specific uses. Users must conduct prior testing for their applications and make necessary adjustments.

Users are responsible for the safety of applications utilizing our products and must implement adequate safety measures to prevent physical injury, fire, or other risks in case of product failure. It is the user's duty to ensure that application designs comply with all applicable laws and standards. Our products must not be used in any applications where a product failure could reasonably result in personal injury, unless specifically authorized in a signed document by Zhuhai Hypersemi Co., Ltd.

No representations or warranties are made regarding the accuracy or completeness of this information, including any claims of non-infringement of third-party intellectual property rights. Zhuhai Hypersemi Co., Ltd. assumes no liability for any applications or uses of its products and does not grant any licenses to its intellectual property rights or those of others. We also make no claims regarding non-infringement of third-party intellectual property rights that may arise from applications.

Due to technical requirements, our products may contain hazardous substances. For details, please contact your nearest sales office. This document replaces all previous information and may be updated. We reserve the right to make changes.