N-Channel Enhancement Mode Field Effect Transistor

General Description

Greenchip adopts advanced trench gate super junction technology and design to provide excellent RDS(ON) with low gate charge. This super junction MOSFET fits the industry's AC-DC SMPS requirements for UPS, AC-DC power conversion,ATX power supplies, and industrial power applications.

Features

- Large current and voltage handling capability
- Strong surge current prevention
- New technology for high voltage device
- Low on-resistance and low conduction losses
- Small package
- Ultra Low Gate Charge cause lower driving requirements
- ROHS compliant

Typical information

$V_{(BR)DSS}$	$R_{DS(ON)typ}$	I_D
650V	340mΩ	12A

Applications

- LCD/LED/PDP TV
- Switched mode power supplies(SMPS)
- Uninterruptible Power Supply（UPS）
- ATX power supplies
- Industrial power applicatio

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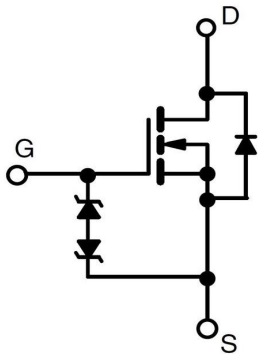


Schematic diagram

ABSOLUTE MAXIMUN RATINGS

PARAMETERS/TEST CONDITIONS	SYMBOL	LIMITS	UNITS
Drain-Source Voltage	V_{DS}	650	V
Drain Current –continuous @25°C	I_D	12	A
Drain Current –continuous @100°C	I_D	9	A
Pulsed Drain Current[1]	I_{DM}	60	A
Gate-Source Voltage	V_{GS}	±30	V
Single Pulse Avalanche[2]	E_{AS}	504	mJ
Operating Junction & Storage Temperature	T_j, T_{stg}	-55 to 150	°C
Lead Temperature (1/16” from case for 10sec.)	T_L	300	°C

Note:

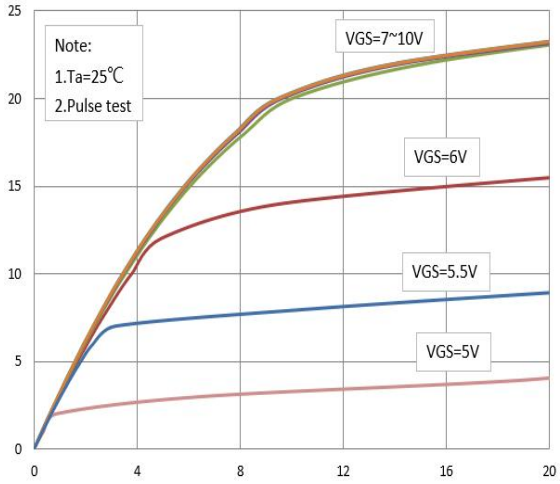
1.Pulse width limited by maximum junction temperature.

2.VDD = 100V, VDS = 650V, L=30mH

ELECTRICAL CHARACTERISTICS

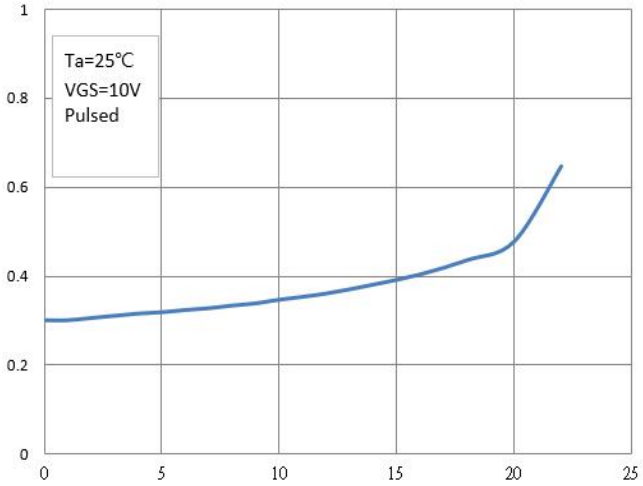
PARAMETER	SYMBOL	TEST CONDITIONS	LIMITS			UNIT
			MIN	TYP	MAX	
STATIC						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	V_{GS} = 0V, I_D = 250μA	650			V
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS} = V_{GS}, I_D = 250μA	2.5	3.5	4.5	
Gate-Body Leakage	I_{GSS}	V_{DS} = 0V, V_{GS} = ±30V			±1	μA
Zero Gate Voltage Drain Current	I_{DSS}	VDS = 650V, VGS = 0V			1	μA
		VDS = 650V, VGS = 0V, TJ =150oC			100	
On-State Drain Current	$R_{DS(ON)}$	V_{GS} = 10V, I_D = 6A		340	380	mΩ
Body Diode Forward Voltage	V_{SD}	T_J = 25°C, V_{GS} = 0V, I_{SD} = 12A		0.9	1.4	V
DYNAMIC PARAMETERS						
Input Capacitance	C_{iss}	V_{GS} = 0V, V_{DS} = 50V, f = 1 MHz		886		pF
Output Capacitance	C_{oss}			62		
Reverse Transfer Capacitance	C_{rss}			2.8		
Total Gate Charge	Q_g	V_{DD} = 100V, I_D = 12A, V_{GS} = 10V		33		nC
Gate-Source Charge	Q_{gs}			10.2		
Gate-Drain Charge	Q_{gd}			9.1		
SWITCHING CHARACTERISTICS						
Turn-On Delay Time	$t_{(on)}$	VGS = 10V, VDD = 100V, ID = 12A, RG = 25Ω,		12		ns
Rise Time	tr			21		
Turn-Off Delay Time	$t_{(off)}$			68		
Fall Time	t_f			48		
SOURCE-DRAIN DIODE RATINGS AND CHARACTERISTICS (T_C = 25 °C)						
Continuous Current	I_S				12	A
Forward Voltage	V_{SD}	I_F =Is, V_{GS} = 0V			0.9	V
Body Diode Reverse Recovery Time	Trr	I_F =I_S, di/dt =100A/us		336		nS
Body Diode Reverse Recovery Charge	Qrr			4.2		uC

ELECTRICAL CHARACTERISTICS DIAGRAMS



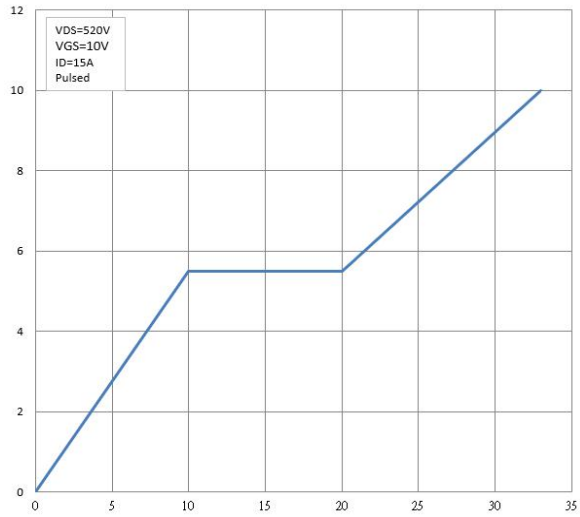
Drain-Source Voltage, VDS(V)

Figure 1. Output characteristics



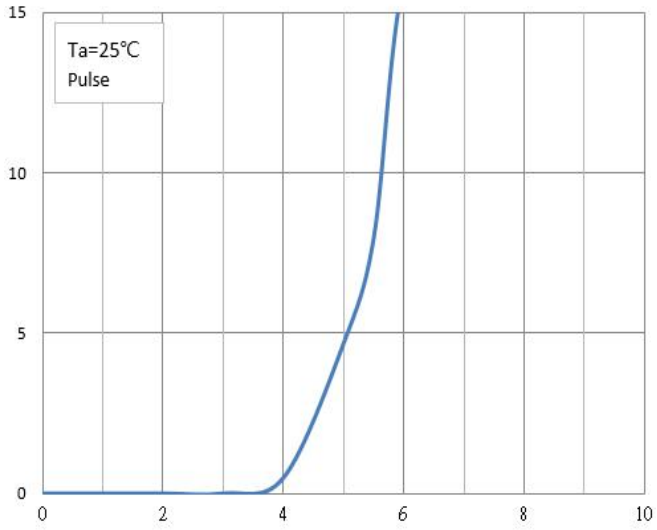
Drain Current, ID(A)

Figure 2. Rdson vs. ID



Total Gate Charge: QG (nC)

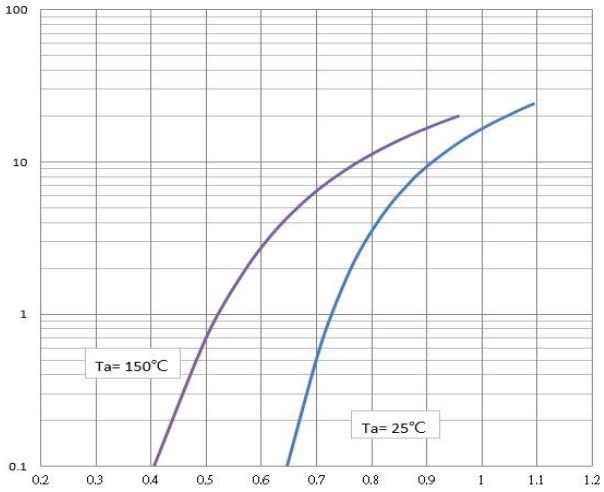
Figure 3. Gate Charge characteristics



Gate Source Voltage, VGS(V)

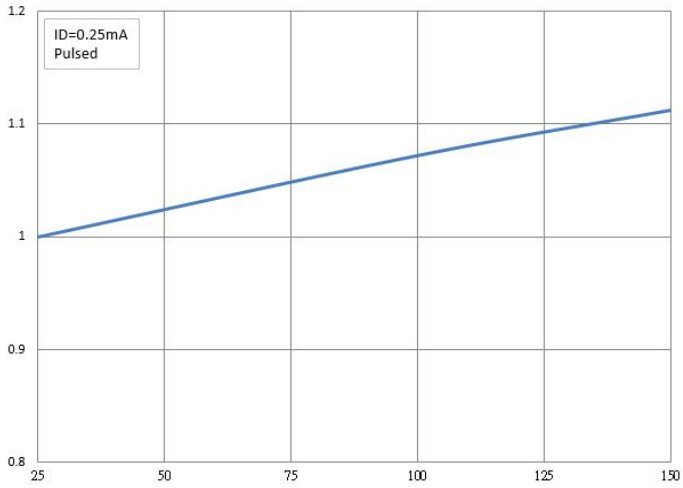
Figure 4. ID vs. Vgs

ELECTRICAL CHARACTERISTICS DIAGRAMS



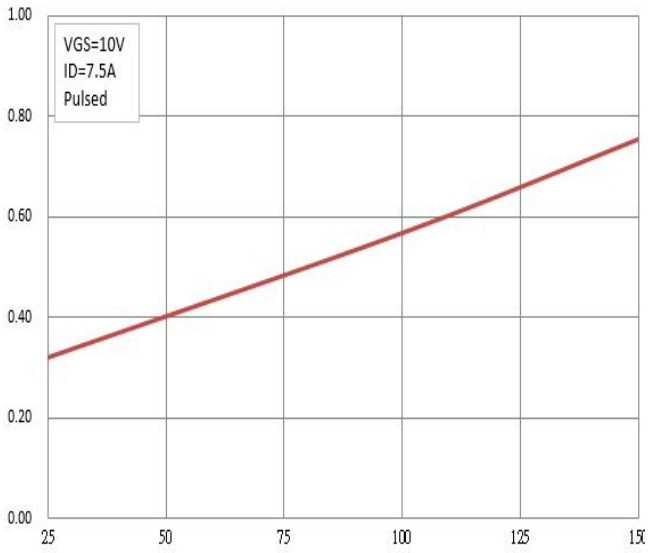
Source Drain Voltage, VSD(V)

Figure 5. IS vs. VSD



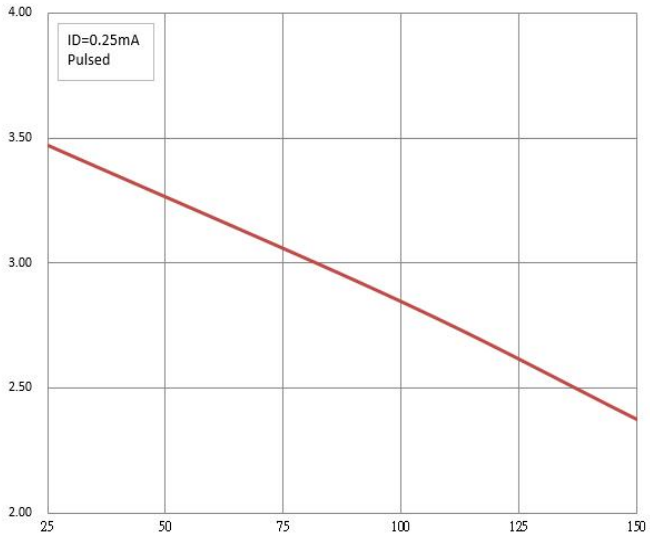
Junction Temperature : TJ(°C)

Figure 6. Breakdown vs. Temperature



Junction Temperature : TJ(°C)

Figure 7. On-Resistance vs. Junction



Drain Source Voltage, VDS(V)

Figure 8. Vth vs. Junction Temperature

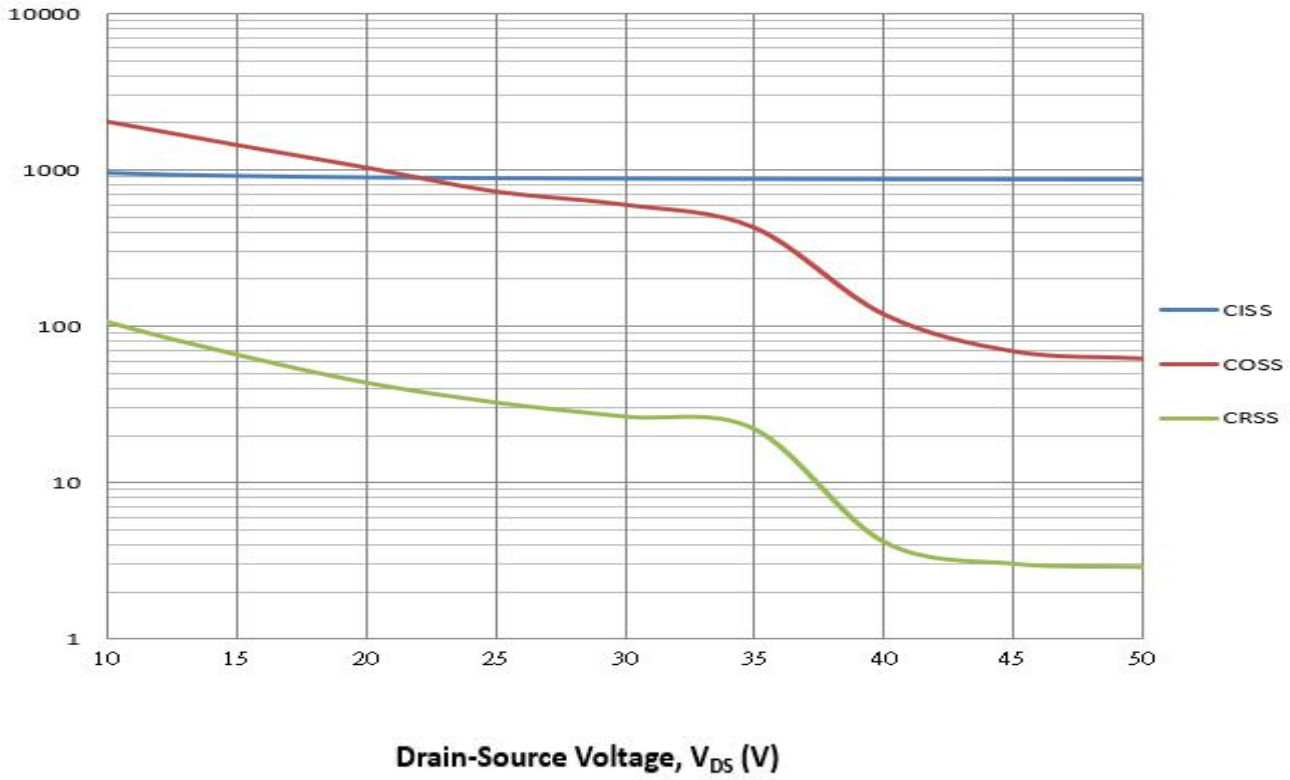


Figure 9. Capacitance characteristics

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