

N-Channel Enhancement Mode Field Effect Transistor

General Description

Greenchip adopts advanced trench gate super junction technology and design to provide excellent $R_{DS(ON)}$ 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

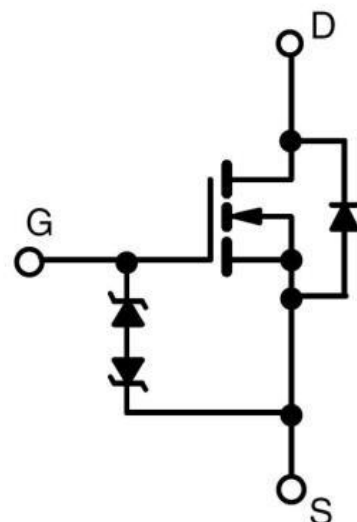
Typical information

$V_{(BR)DSS}$	$R_{DS(ON)typ}$	I_D
650V	37m Ω	75A

Applications

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

FRD MOSFET



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	75	A
Drain Current –continuous @100°C	I_D	45	A
Pulsed Drain Current ¹	I_{DM}	300	A
Gate-Source Voltage	V_{GS}	±30	V
Single Pulse Avalanche ²	E_{AS}	2.4	J
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 = 90V, VDS = 650V, L=100mH

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	3	4	
Gate-Body Leakage	I _{GSS}	V _{DS} = 0V, V _{GS} = ±30V			±10	μA
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} = 650V, V _{GS} = 0V			10	μA
		V _{DS} = 650V, V _{GS} = 0V, T _J =150oC			100	
On-State Drain Current	R _{DS(ON)}	V _{GS} = 10V, I _D = 37.5A		37	43	mΩ
Body Diode Forward Voltage	V _{SD}	T _J = 25°C, V _{GS} = 0V, I _{SD} = 75A		1.1	1.4	V
DYNAMIC PARAMETERS						
Input Capacitance	C _{iss}	V _{GS} = 0V, V _{DS} = 50V, f = 100 KHz		6727		pF
Output Capacitance	C _{oss}			466		
Reverse Transfer Capacitance	C _{rss}			1		
Total Gate Charge	Q _g	V _{DD} = 100V, I _D = 80A, V _{GS} = 10V		161		nC
Gate-Source Charge	Q _{gs}			35.5		
Gate-Drain Charge	Q _{gd}			57.8		
SWITCHING CHARACTERISTICS						
Turn-On Delay Time	t _(on)	V _{GS} = 10V, V _{DS} = 100V, ID = 80A, RG = 25Ω,		82		ns
Rise Time	t _r			50		
Turn-Off Delay Time	t _(off)			449		
Fall Time	t _f			23.8		
Continuous Current	I _s				80	A
Forward Voltage	V _{SD}	I _F =I _s , V _{GS} = 0V		1.1		V
Body Diode Reverse Recovery Time	T _{rr}	I _F =30A, di/dt =100A/us		200		nS
Body Diode Reverse Recovery Charge	Q _{rr}			1.35		nC

ELECTRICAL CHARACTERISTICS DIAGRAMS

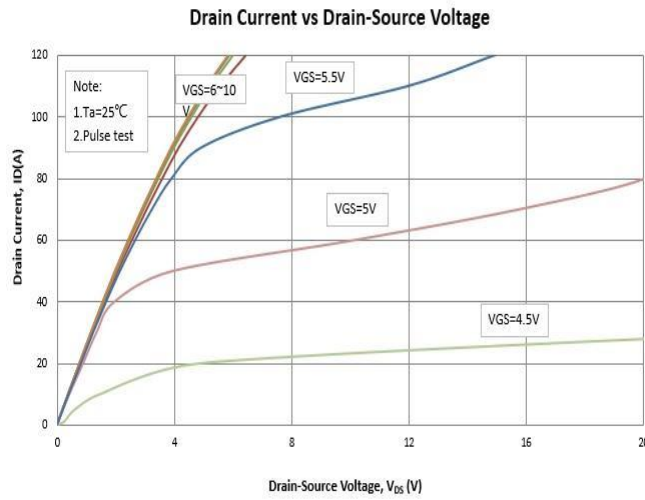


Figure 1. Output characteristics

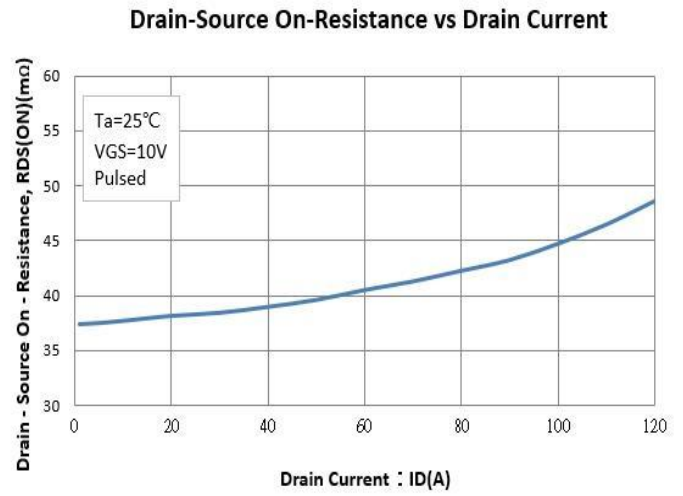


Figure 2. Rdson vs. ID

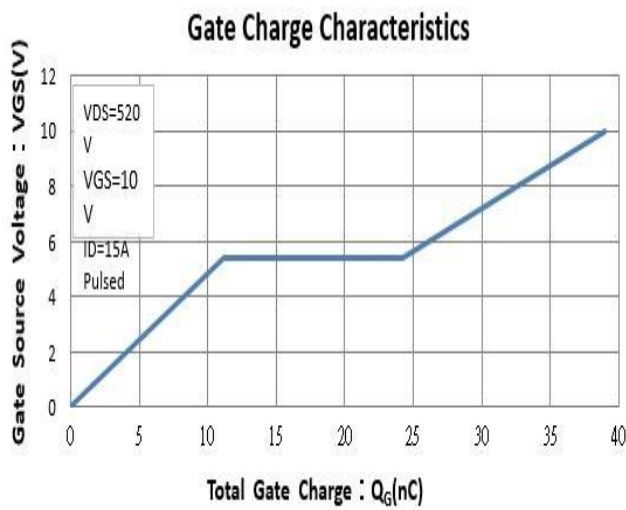


Figure 3. Gate Charge characteristics

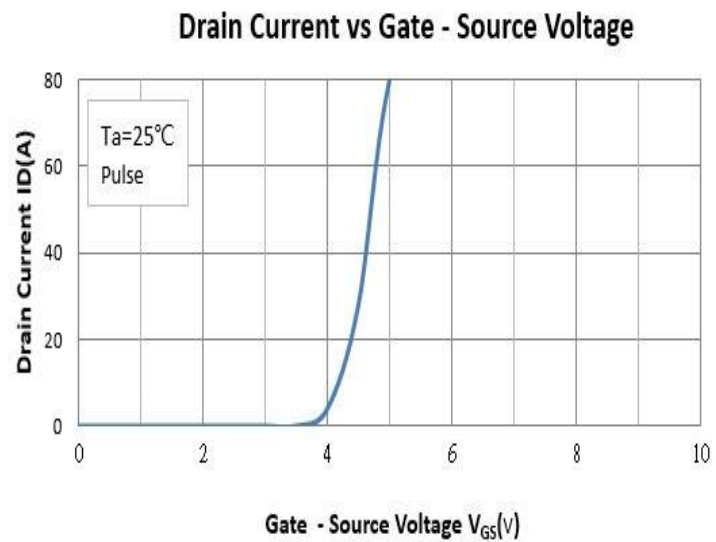


Figure 4. ID vs. Vgs

ELECTRICAL CHARACTERISTICS DIAGRAMS

Source Current vs Source Drain Voltage

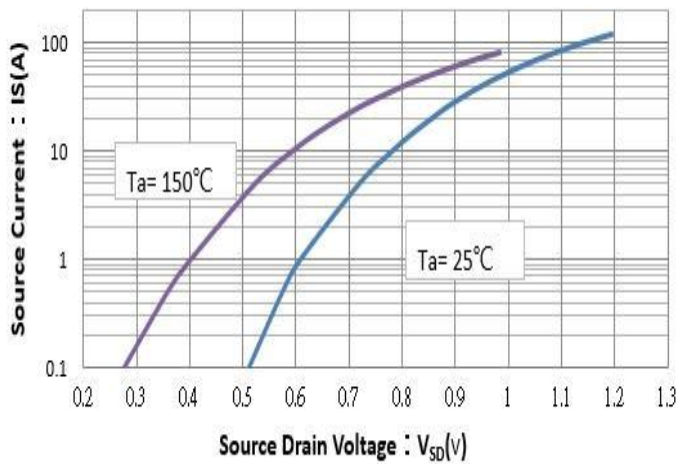


Figure 5. I_S vs. V_{SD}

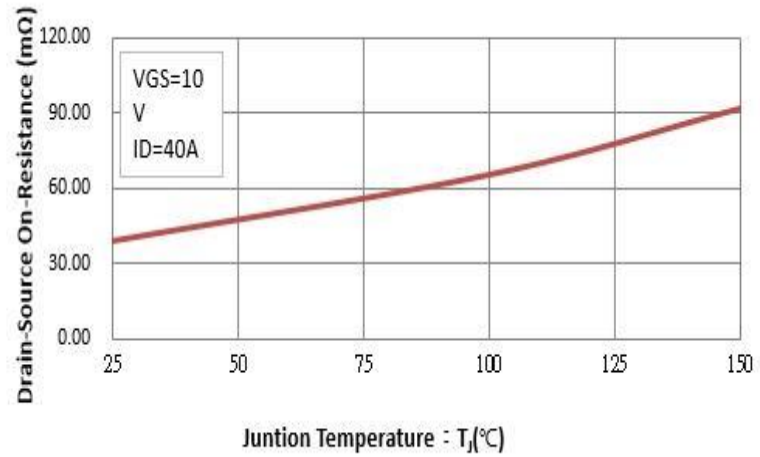


Figure 6. On-Resistance vs. Junction Temperature

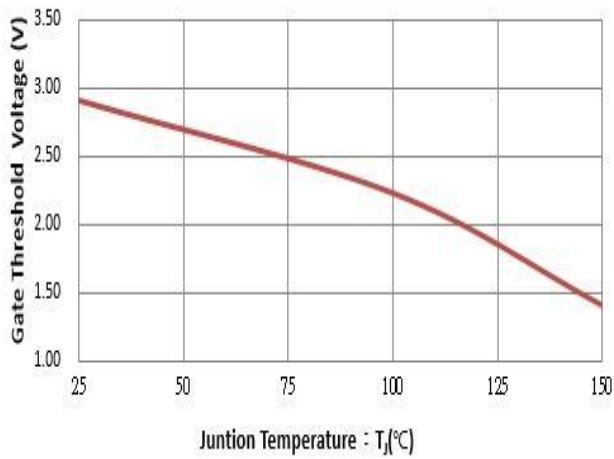


Figure 7. V_{th} vs. Junction Temperature

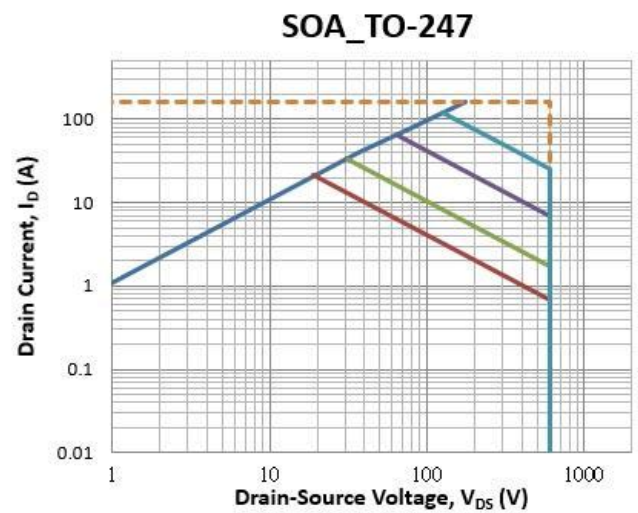


Figure 8. Safe Operating Area

ELECTRICAL CHARACTERISTICS DIAGRAMS

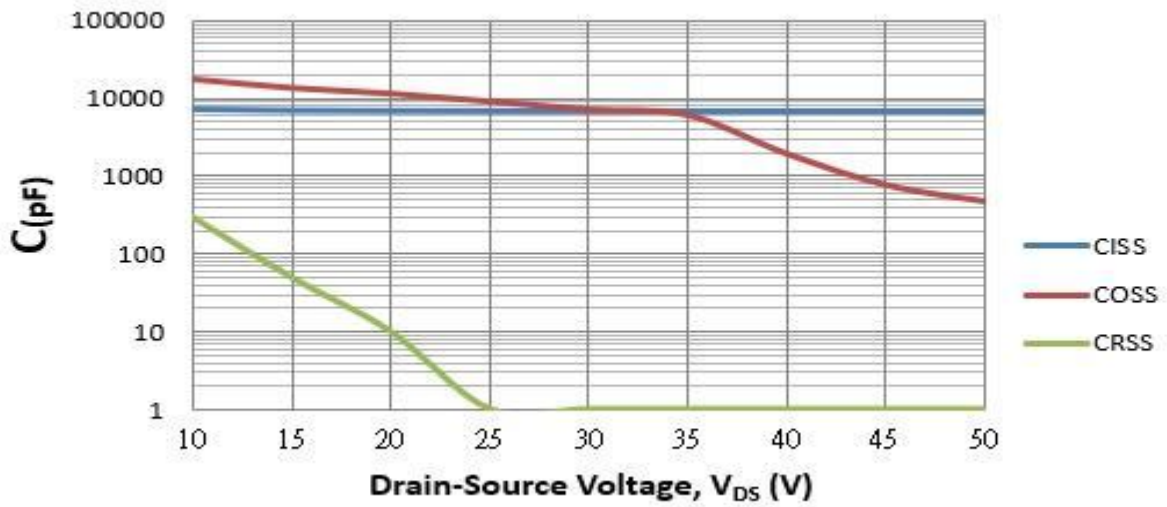


Figure 9. Capacitance characteristics

TO-247-3L Package Outline

