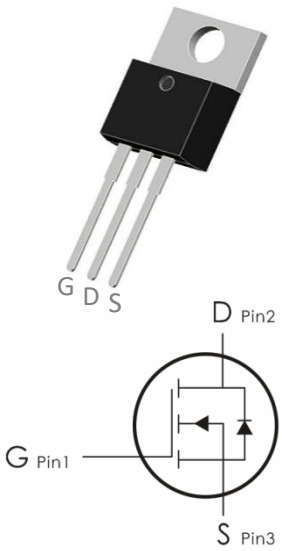
Description：

This N-Channel MOSFET uses advanced SGT technology and design to provide excellent $R_{DS(on)}$ with low gate charge.

It can be used in a wide variety of applications.



Features：

1) V_{DS}=100V,I_D=45A,$R_{DS(ON)}$<16mΩ @V_{GS}=10v
2) Low gate charge.
3) Green device available.
4) Advanced high cell denity trench technology for ultra low $R_{DS(ON)}$.
5) Excellent package for good heat dissipation.

Package Marking and Ordering Information：

Part NO.	Marking	Package	Packing
IRF540N	F540N	TO- 220	50 pcs/Tube

Absolute Maximum Ratings： (T_C=25℃ unless otherwise noted)

Symbol	Parameter	Ratings	Units
V_{DS}	Drain-Source Voltage	100	V
V_{GS}	Gate-Source Voltage	±20	V
I_D	Continuous Drain Curren[1]	45	A
I_{DM}	Pulsed Drain Current[2]	135	
P_D	Power Dissipation[3]	95	W
E_{AS}	Single pulse avalanche energy[5]	18	mJ
T_J, T_{STG}	Operating and Storage Junction Temperature Range	-55-+150	℃

Thermal Characteristics：

Symbol	Parameter	Max	Units
$R_{\theta JC}$	Thermal Resistance,Junction to Case	1.45	℃/W

$R_{\theta JA}$	Thermal Resistance,Junction to Ambient	62	℃/W

Electrical Characteristics: (T_C=25℃ unless otherwise noted)

Symbol	Parameter	Conditions	Min	Typ	Max	Units
Off Characteristics						
BV_{DSS}	Drain-Sourtce Breakdown Voltage	V_{GS}=0V,I_D=250μA	100	---	---	V
I_{DSS}	Zero Gate Voltage Drain Current	V_{GS}=0V, V_{DS}=100V	---	---	1	μA
I_{GSS}	Gate-Source Leakage Current	V_{GS}=±20V, V_{DS}=0A	---	---	±100	nA
On Characteristics						
$V_{GS(th)}$	GATE-Source Threshold Voltage	V_{GS}=V_{DS}, I_D=250μA	1.2	---	2.2	V
$R_{DS(ON)}$	Drain-Source On Resistance	V_{GS}=10V,I_D=10A	---	13.9	16	mΩ
	Drain-Source On Resistance	V_{GS}=4.5V,I_D=7A	---	18.1	23.0	mΩ
Dynamic Characteristics						
C_{iss}	Input Capacitance	V_{DS}=25V, V_{GS}=0V, f=0.1MHz	---	916	---	pF
C_{oss}	Output Capacitance		---	484	--	
C_{rss}	Reverse Transfer Capacitance		---	36	---	
Switching Characteristics						
$t_{d(on)}$	Turn-On Delay Time	V_{DS}=50V, I_D=25A, R_{ENG}=2Ω ,V_{GS}=10V	---	17.3	---	ns
t_r	Rise Time		---	4.3	---	ns
$t_{d(off)}$	Turn-Off Delay Time		---	30.5	---	ns
t_f	Fall Time		---	5.7	---	ns
Q_g	Total Gate Charge	V_{GS}=10V, V_{DS}=50V, I_D=25A	---	15.6	---	nc
Q_{gs}	Gate-Source Charge		---	2.8	---	nc
Q_{gd}	Gate-Drain “Miller” Charge		---	3.2	---	nc
Drain-Source Diode Characteristics						
V_{SD}	Diode Forward Voltage	V_{GS}=0V, I_{SD}=10A	---	---	1.3	V
I_S	Continuous Drain Curren[1]	VD=VG=0V	---	---	45	A
I_{SM}	Pulsed Drain Current[2]		---	---	135	A
Trr	Reverse Recovery Time	I_F=25A, V_R=50V dI/dt=100A/us	---	52	---	ns
Qrr	Reverse Recovery Charge		---	61.6	---	nc

Notes:

1. Calculated continuous current based on maximum allowable junction temperature.
2. Repetitive rating; pulse width limited by max. junction temperature.
3. Pd is based on max. junction temperature, using junction-case thermal resistance.
4. The value of $R_{\theta JA}$ is measured with the device mounted on 1 in 2 FR-4 board with 2oz. Copper, in a still air environment with T_a=25 °C.
5. V_{DD}=50 V,V_{GS}=10 V, L=0.3 mH, starting T_j=25 °C.

Typical Characteristics: (T_C=25℃ unless otherwise noted)

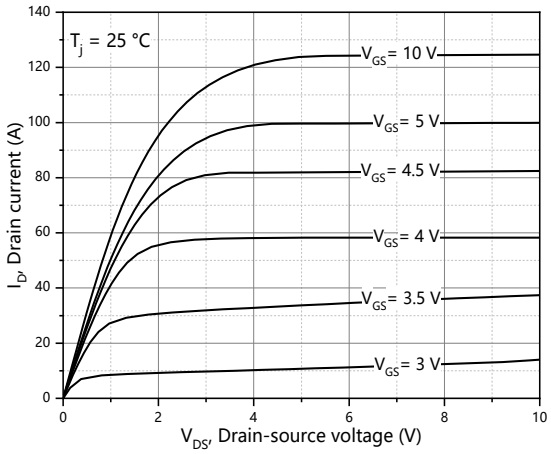


Figure 1. Typ. output characteristics

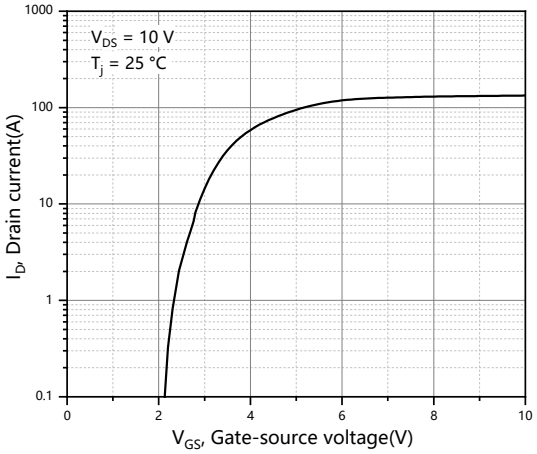


Figure 2. Typ. transfer characteristics

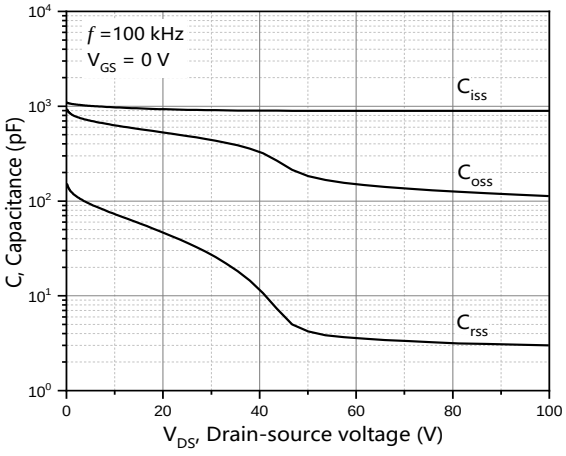


Figure 3. Typ. capacitances

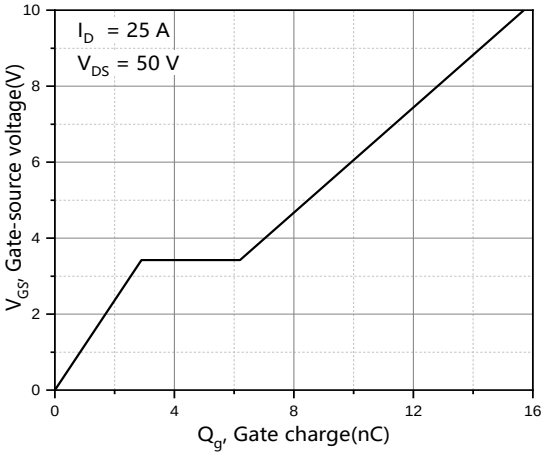


Figure 4. Typ. gate charge

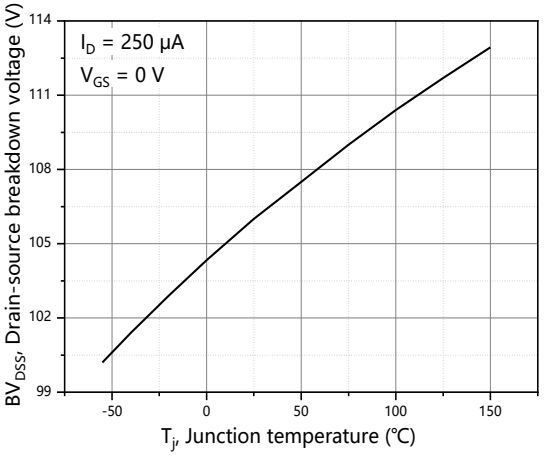


Figure 5. Drain-source breakdown voltage

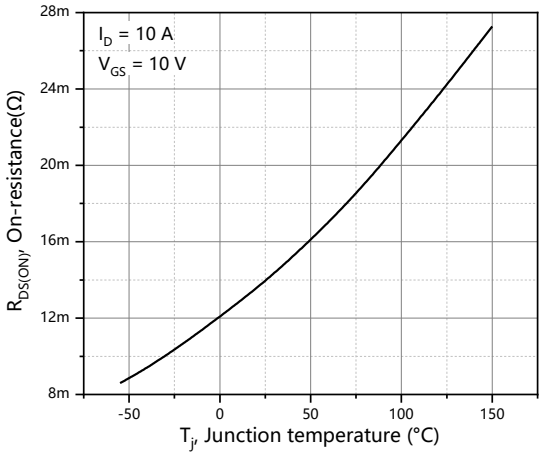


Figure 6. Drain-source on-state resistance

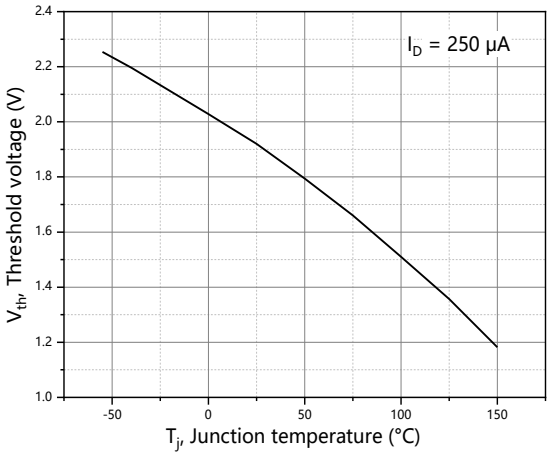


Figure 7. Threshold voltage

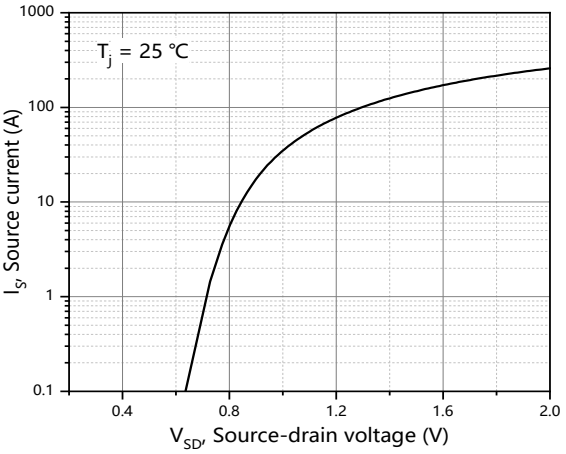


Figure 8. Forward characteristic of body diode

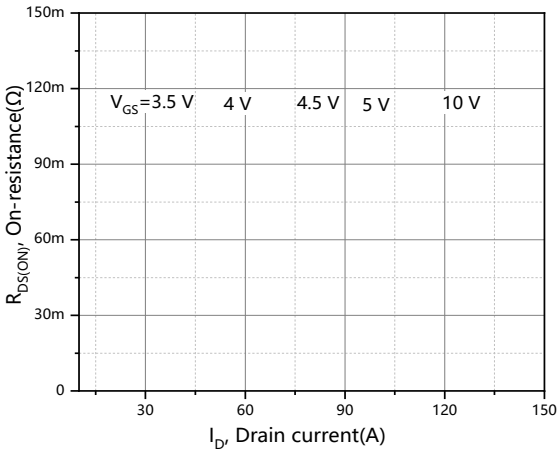


Figure 9. Drain-source on-state resistance

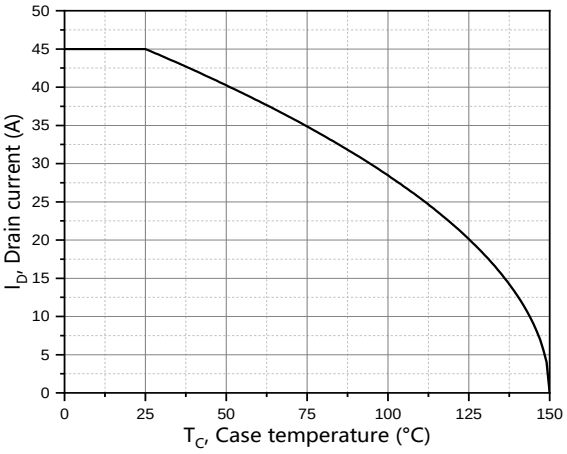


Figure 10. Drain current

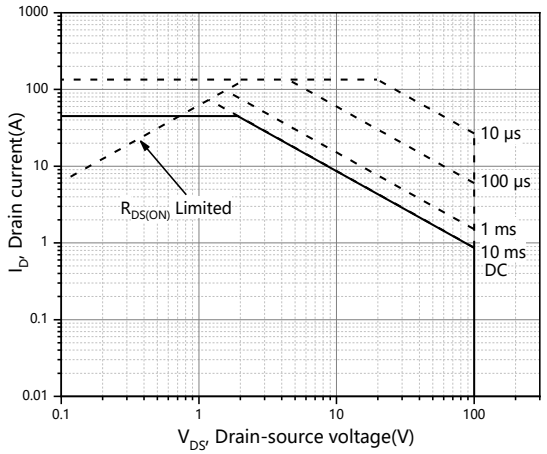


Figure 11. Safe operation area T_C=25 ℃

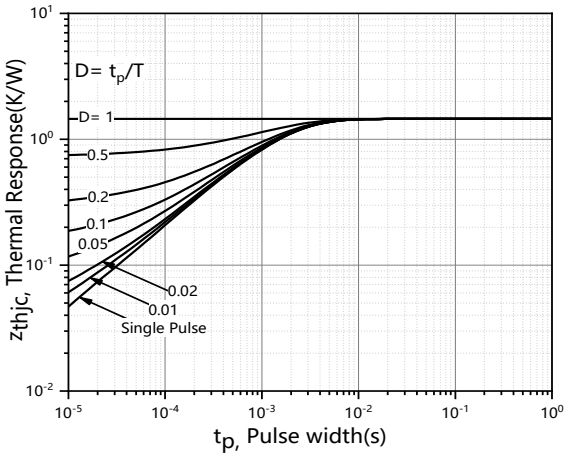
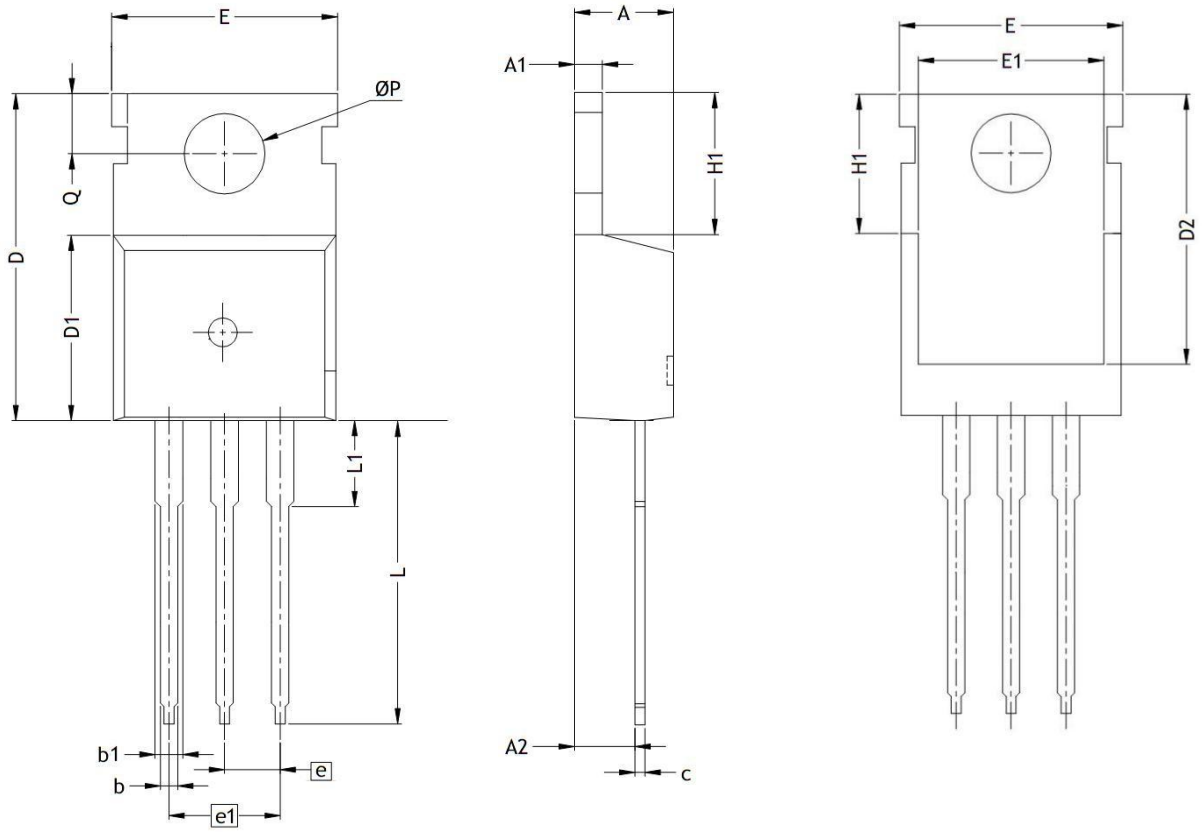


Figure 12. Max. transient thermal impedance

TO-220 Package Information：



UNIT：mm

SYMBOLS	A	A1	A2	b	b1	c	D	D1	D2	E	E1	e
MIN	4.25	1.25	2.35	0.7	1.15	0.45	14.35	8.80	13.05	9.90	7.85	2.540
MAX	4.65	1.35	2.55	0.9	1.75	0.60	15.95	9.50	13.65	10.35	8.85	BSC
SYMBOLS	e1	H1	L	L1	Q	ϕP						
MIN	5.080	6.30	12.85	2.85	2.70	3.50						
MAX	BSC	6.65	13.50	3.25	2.90	3.70						

Marking Information：

①. Doingter LOGO

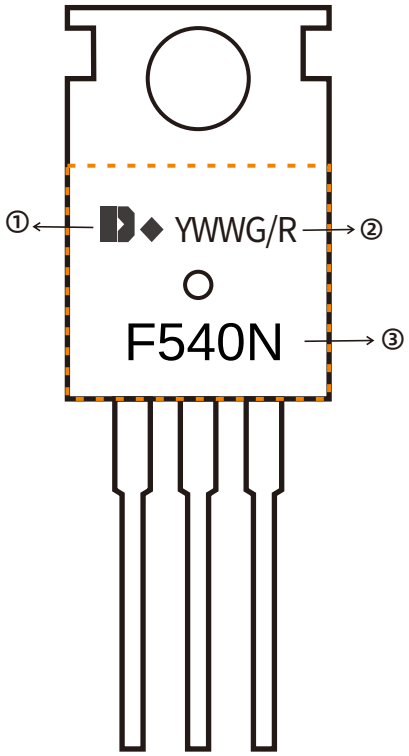
②. Date Code(YWWG / R)

Y : Year Code , last digit of the year

WW : Week Code(01-53)

G/R : G(Green) /R(Lead Free)

③. Part NO.



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