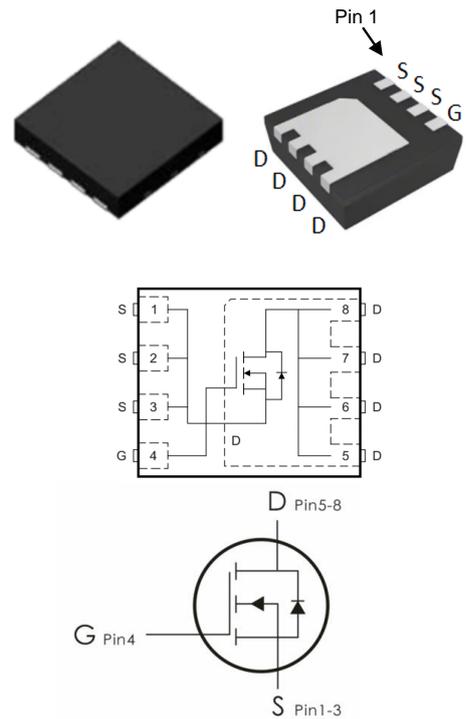# YC1R9TG-PL

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}=30V,I_D=140A,$R_{DS(ON)}$<1.9mΩ @V_{GS}=10V（Typ：1.5mΩ）

2) Low gate charge.

3) Green device available.

4) Advanced high cell denity SGT technology for ultra low $R_{DS(ON)}$.

5) Excellent package for good heat dissipation.

6) MSL3

Package Marking and Ordering Information：

Part NO.	Marking	Package	Packing
YC1R9TG-PL	C1R9T-PL	TDFN3333-8PL	5000 pcs/Reel

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

Symbol	Parameter	Ratings	Units
V_{DS}	Drain-Source Voltage	30	V
V_{GS}	Gate-Source Voltage	$\pm$20	V
I_D	Continuous Drain Current[1]	140	A
	Continuous Drain Current-T_C=100℃[1]	98	
I_{DM}	Pulsed Drain Current[2]	420	
P_D	Power Dissipation	250	W
E_{AS}	Single pulse avalanche energy[3]	116	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	0.5	℃/W
$R_{\theta JA}$	Thermal Resistance,Junction to Ambient	50	℃/W

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YC1R9TG-PL

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	30	---	---	V
I_{DSS}	Zero Gate Voltage Drain Current	V_{GS}=0V, V_{DS}=30V	---	---	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	1.6	1.2	V
$R_{DS(ON)}$	Drain-Source On Resistance[4]	V_{GS}=10V,I_D=20A	---	1.5	1.9	mΩ
		V_{GS}=4.5V,I_D=10A	---	2.2	2.4	
Dynamic Characteristics						
C_{iss}	Input Capacitance		---	2350	---	
C_{oss}	Output Capacitance	V_{DS}=20V, V_{GS}=0V, f=1MHz	---	1406	---	pF
C_{rss}	Reverse Transfer Capacitance		---	86	---	
Switching Characteristics						
$t_{d(on)}$	Turn-On Delay Time		---	17.4	---	ns
t_r	Rise Time	V_{DS}=20V, I_D=30A,	---	4.1	---	ns
$t_{d(off)}$	Turn-Off Delay Tim	R_G=1.6Ω ,V_{GS}=10V	---	55.4	---	ns
t_f	Fall Time		---	11.1	---	ns
Q_g	Total Gate Charge		---	36	---	nC
Q_{gs}	Gate-Source Charge	V_{GS}=10V, V_{DS}=20V, I_D=30A	---	8	---	nC
Q_{gd}	Gate-Drain "Miller" Charge		---	5.9	---	nC
Drain-Source Diode Characteristics						
V_{SD}	Diode Forward Voltage	V_{GS}=0V, I_{SD}=30A	---	---	1.2	V
I_S	Continuous Drain Curren	V_D=V_G=0V	---	---	140	A
I_{SM}	Pulsed Drain Current		---	---	420	A
T_{rr}	Reverse Recovery Time[3]	I_F=30A,T_J=25℃	---	85	---	ns
Q_{rr}	Reverse Recovery Charge	dI/dt=100A/us	---	34	---	nC

Notes:

1. Computed continuous current assumes the condition of $T_{j,Max}$ while the actual continuous current depends on the thermal & electro-mechanical application board design

2. Repetitive Rating: Pulse Width Limited by Maximum Junction Temperature

3. EAS condition : TJ=25℃,VDD=15V,V_G=10V,L=0.1mH

4. Pulse Test: Pulse Width≤300µs, Duty Cycle≤0.5%

Typical Characteristics：   (T$_C$=25℃ unless otherwise noted)
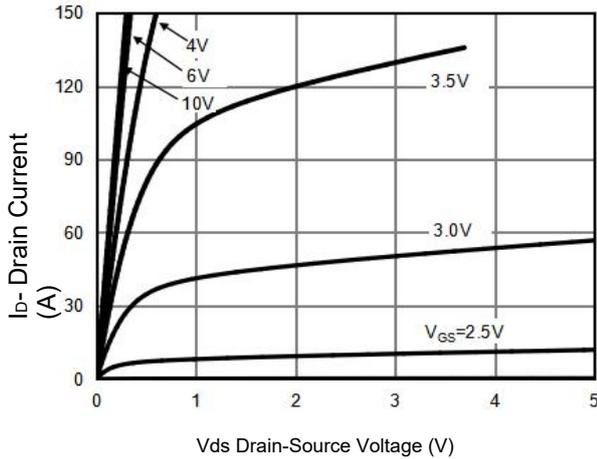
Fig 1: Output Characteristics
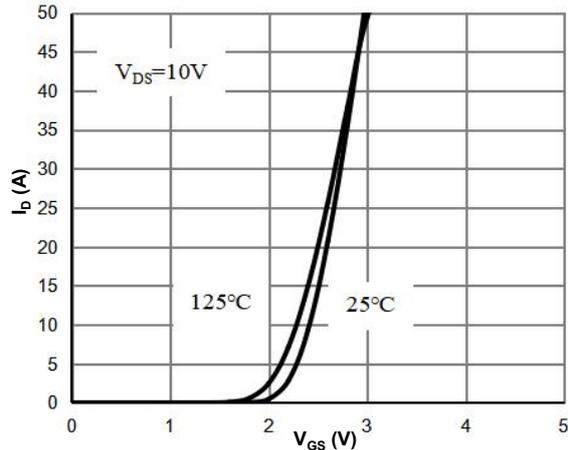
Fig 2: Transfer Characteristics
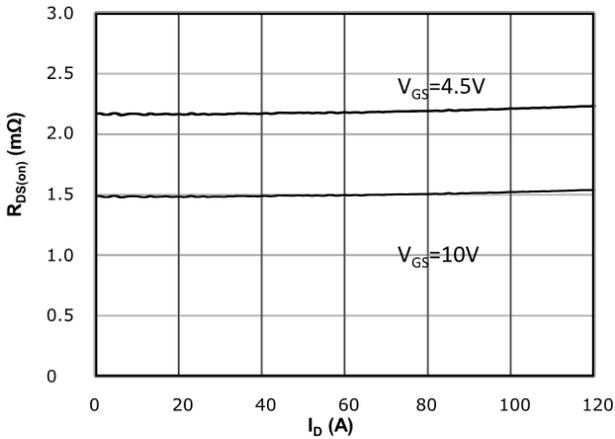
Fig 3: Rds(on) vs Drain Current and Gate Voltage
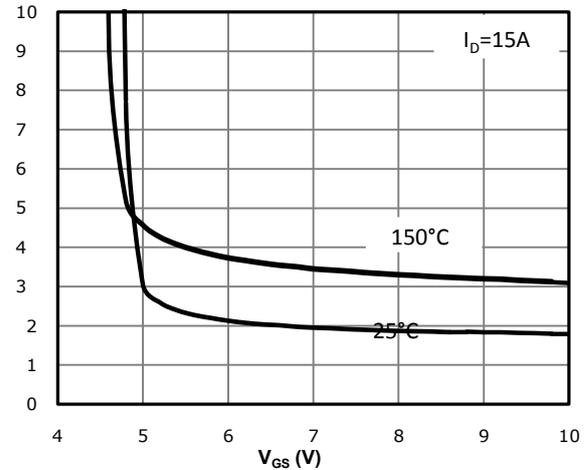
Fig 4: Rds(on) vs Gate Voltage
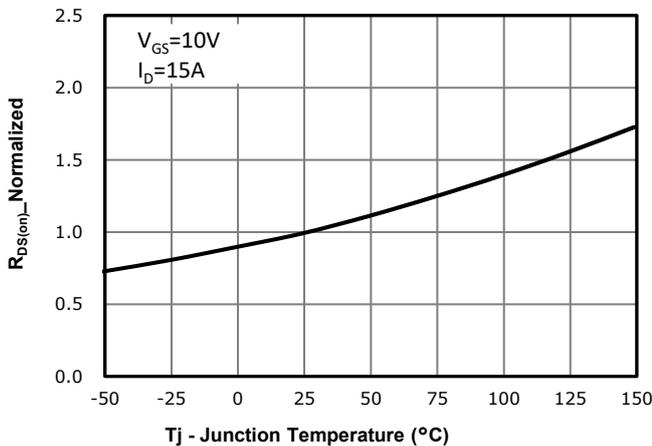
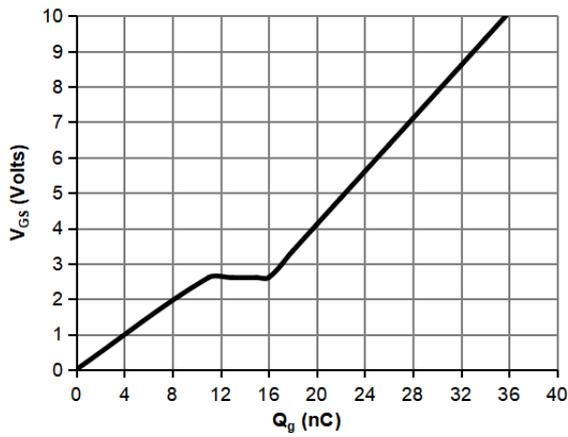Fig 5: Rds(on) vs. Temperature
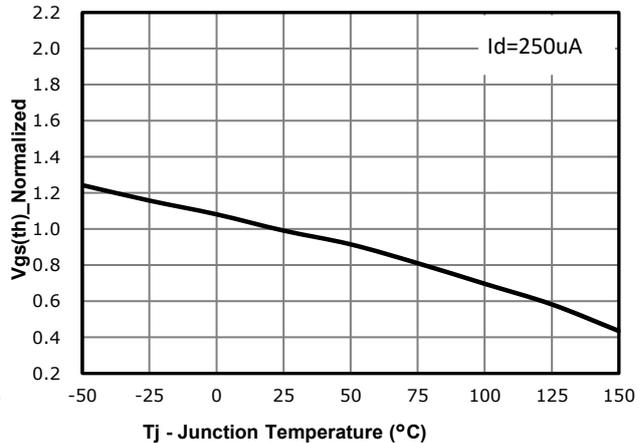
Fig 6: Vgs(th) vs. Temperature
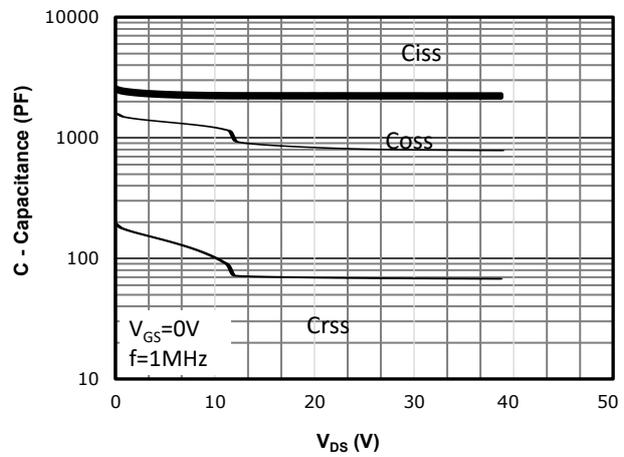
Fig 7: Gate ChargeCharacteristics
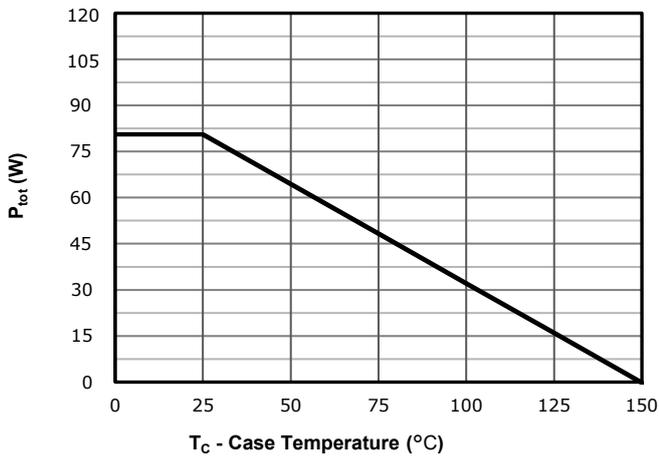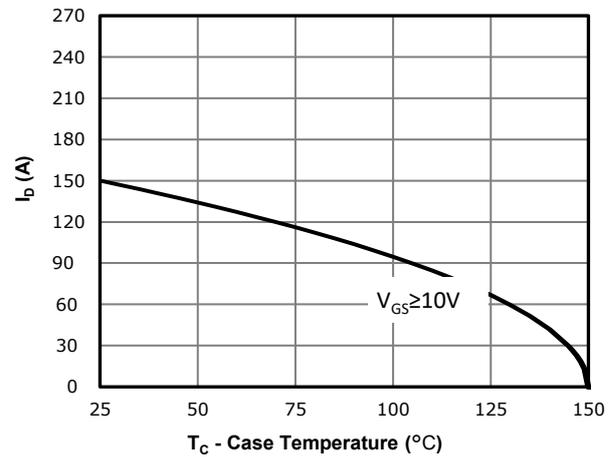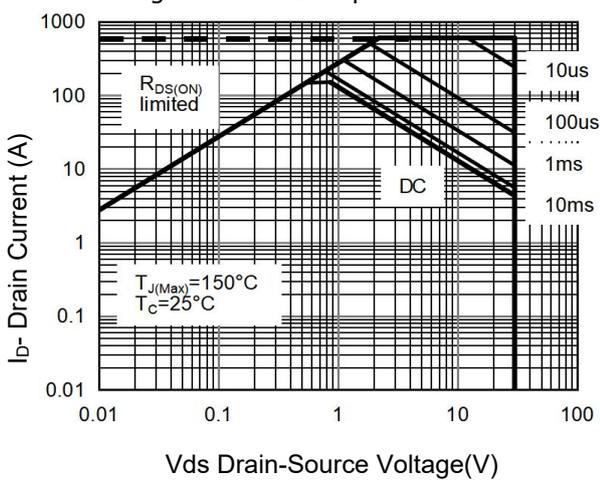
Fig 8: Capacitance Characteristics

Fig 9: Power Dissipation

Fig 10: Drain Current Derating

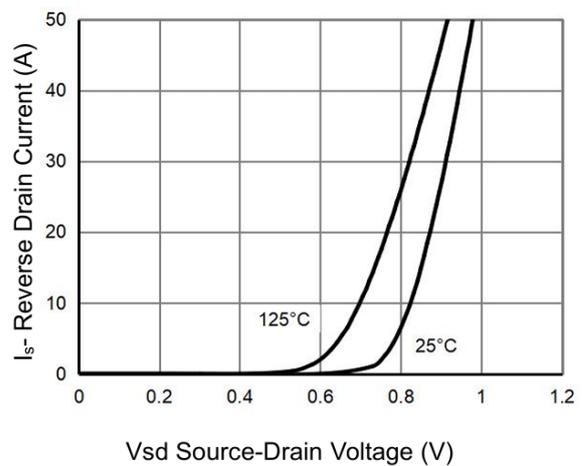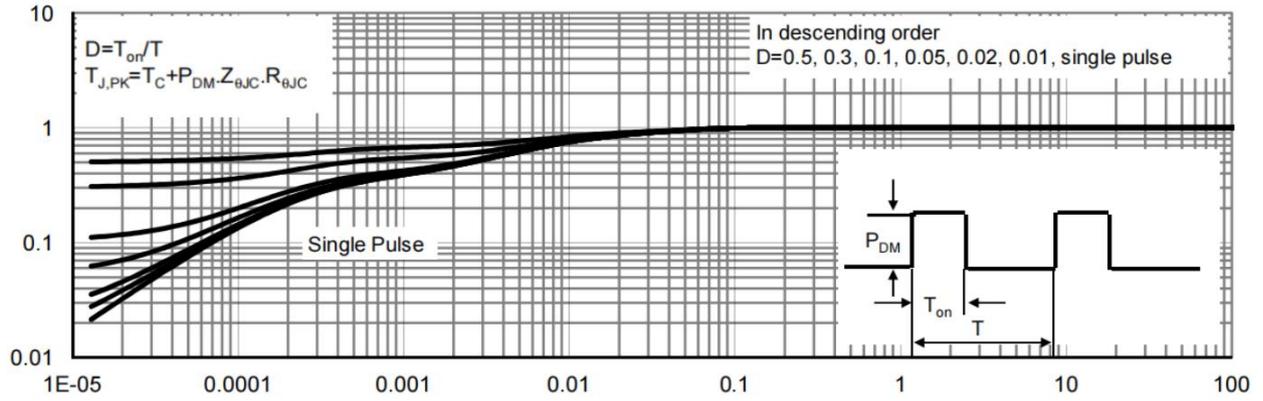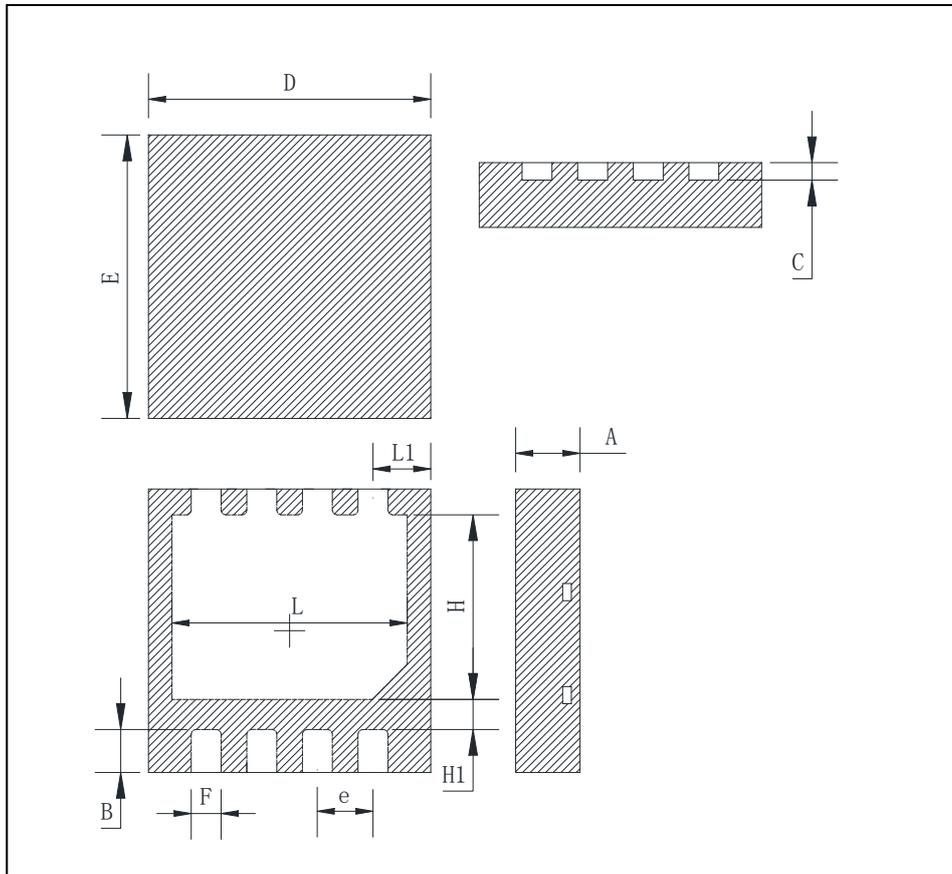**Figure 11 Safe Operation Area**

Figure 12 Source- Drain Diode Forward

Square Wave Pluse Duration(sec)

Figure 13 Normalized Maximum Transient Thermal Impedance

TDFN3333-8PL Package Information：

UNIT：mm

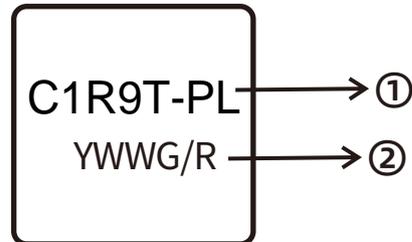| Symbol	Min	Typ	Max
A	0.70	0.75	0.80
B	0.40	0.50	0.60
C	0.153	0.203	0.253
D	3.20	3.30	3.40
E	3.20	3.30	3.40
e	0.60	0.65	0.70
F	0.30	0.35	0.40
H	2.05	2.15	2.25
H1	0.25	0.35	0.45
L	2.65	2.75	2.85
L1	0.575	0.675	0.775

Marking Information：

①. Part NO.

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)

C1R9T-PL → ①

YWWG/R → ②

Previous Version

Version	Date	Subjects (major changes since last revision)
1.0	2025-07-20	Release of final version

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