CT10NR005B

N-CHANNEL ENHANCEMENT MODE POWER MOSFET

»Features

- Fast Switching Speed
- Ultra_Low RDS(ON)
- RoHS Compliant & Halogen-Free

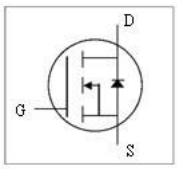
BV_{DSS}	100V
$R_{DS(ON)Typ}$	4.5mΩ
I_D	85A

»Description

CT10NR005B is from Coretong innovated design and silicon process technology to achieve the lowest possible on- resistance and fast switching performance. It provides the designer with an extreme efficient device for use in a wide range of power applications.

The package is special for voltage conversion application using standard infrared reflow technique with the backside heat sink to achieve the good thermal performance.

»Schematic & PIN Configuration



PDFN5x6

»Absolute Maximum Ratings@T_j=25°C(unless otherwise specified)

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	100	V
V_{GS}	Gate-Source Voltage	±20	V
I_D@T_C=25℃	Drain Current, V_{GS} @ 10V	85	A
I_D@TC=100℃	Drain Current, V_{GS} @ 10V	52	A
I_{DM}	Pulsed Drain Current[1]	140	A
P_D@T_A=25℃	Total Power Dissipation	5	W
P_D@T_C=25℃	Total Power Dissipation	85	W
P_D@T_C=100℃	Total Power Dissipation	34	W
I_{AS}	Avalanche Current, Single pulse[2]	16	A
E_{AS}	Avalanche Energy, Single pulse[2]	15	mJ
T_{STG}	Storage Temperature Range	-55 to 150	℃
T_J	Operating Junction Temperature Range	150	℃

»Thermal Data

Symbol	Parameter	Value	Unit
Rthj-c	Maximum Thermal Resistance, Junction-case	1.4	℃/W
Rthj-a	Maximum Thermal Resistance, Junction-ambient[3]	50	℃/W

»Electrical Characteristics@T_j=25 oC(unless otherwise specified)

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Units
BV_{DSS}	Drain-Source Breakdown Voltage	V_{GS}=0V, I_D=250uA	100	-	-	V
$R_{DS(ON)}$	Static Drain-Source On-Resistance4	V_{GS}=10V, I_D=20A	-	4.6	5.5	mΩ
		V_{GS}=4.5V, I_D=10A	-	6.6	9	mΩ
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS}=V_{GS}, I_D=250uA	1	2	3	V
g_{fs}	Forward Transconductance	V_{DS}=5V, I_D=20A	-	45	-	S
I_{DSS}	Drain-Source Leakage Current	V_{DS}=80V, V_{GS}=0V	-	-	1	uA
I_{GSS}	Gate-Source Leakage	V_{GS}=±20V, V_{DS}=0V	-	-	±100	nA
Q_g	Total Gate Charge	I_D=20A V_{DS}=50V V_{GS}=10V	-	71	-	nC
Q_{gs}	Gate-Source Charge		-	12	-	nC
Q_{gd}	Gate-Drain ("Miller") Charge		-	21	-	nC
$t_{d(on)}$	Turn-on Delay Time	V_{DS}=50V I_D=1A R_G=3Ω V_{GS}=10V	-	18	-	ns
t_r	Rise Time		-	13	-	ns
$t_{d(off)}$	Turn-off Delay Time		-	12	-	ns
t_f	Fall Time		-	110	-	ns
C_{iss}	Input Capacitance	V_{GS}=0V V_{DS}=50V f=1.0MHz	-	4200	-	pF
C_{oss}	Output Capacitance		-	3200	-	pF
Crss	Reverse Transfer Capacitance		-	1000	-	pF
Rg	Gate Resistance	f=1.0MHz	-	0.5	-	Ω

»Source-Drain Diode

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Units
V_{SD}	Forward On Voltage4	I_S=20A, V_{GS}=0V	-	0.85	1.1	V
t_{rr}	Reverse Recovery Time	I_S=20A, V_R=50V dI/dt=100A/μs	-	56	-	ns
Q_{rr}	Reverse Recovery Charge		-	110	-	nC

Notes:

1. Maximum current limited by bonding wire
2. UIS tested pulse width are limited by maximum junction temperature 150℃
3. Surface mounted on 1 in^2 2oz copper pad of FR4 board, t <10sec ; 135oC/W when mounted on min. copper pad.

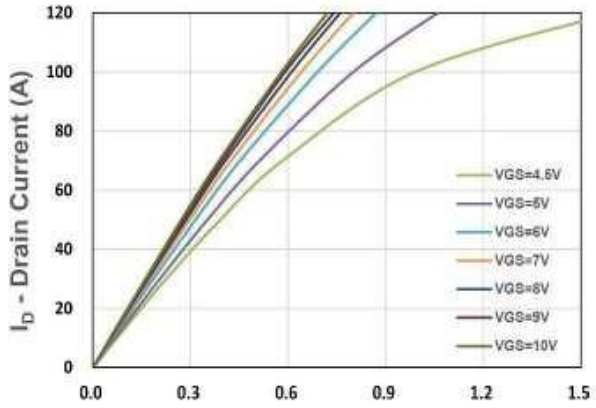


Figure 1. Output Characteristics

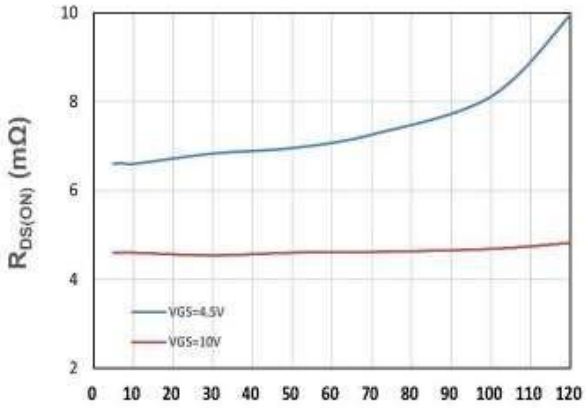


Figure 2. On-Resistance vs. ID

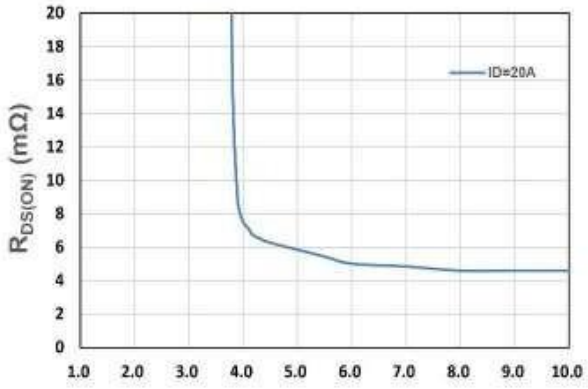


Figure 3. On-Resistance vs. VGS

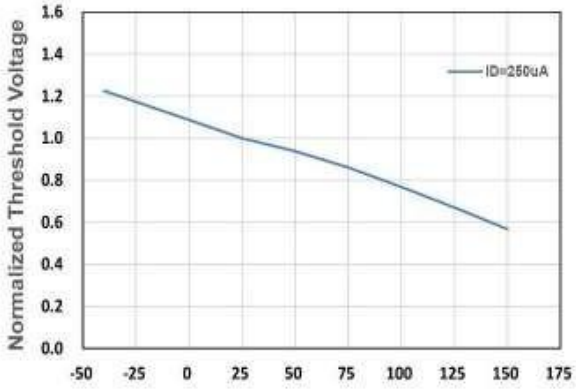


Figure 4. Gate Threshold Voltage

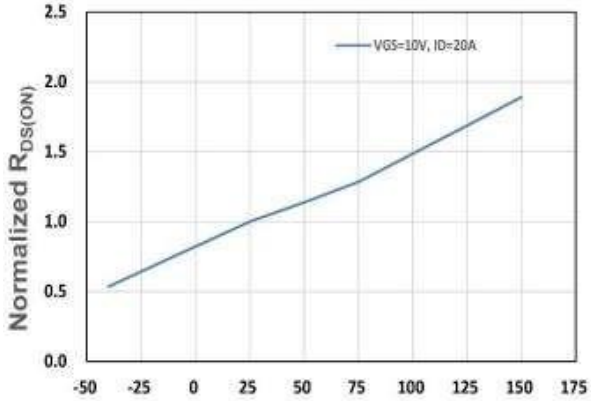


Figure 5. Drain-Source On Resistance

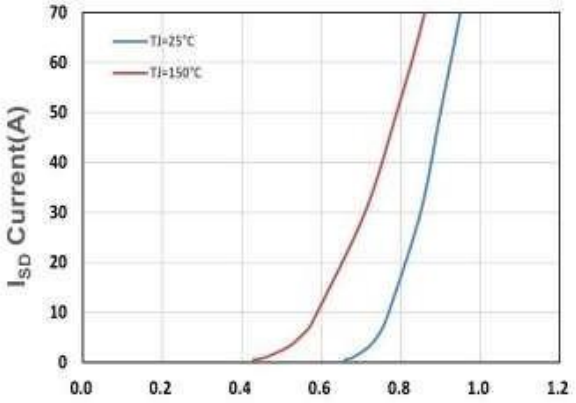


Figure 6. Source-Drain Diode Forward

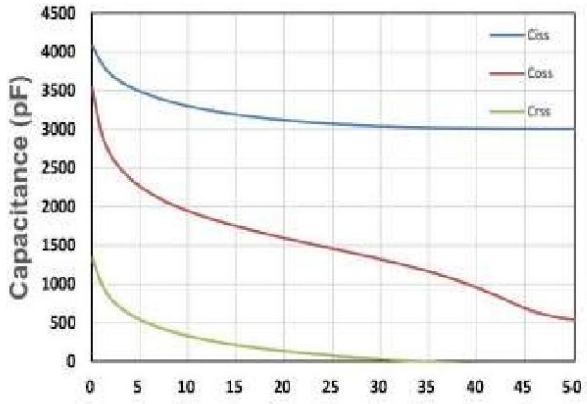


Figure 7. Capacitance

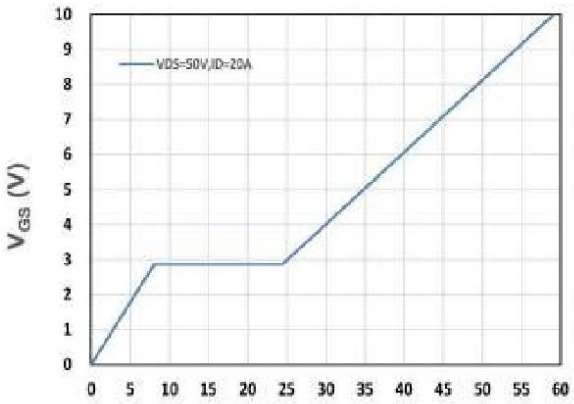


Figure 8. Gate Charge Characteristics

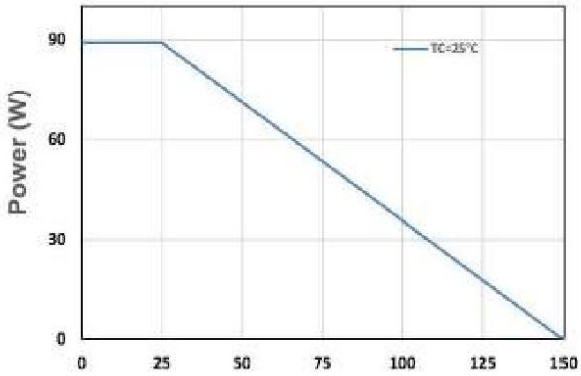


Figure 9. Power Dissipation

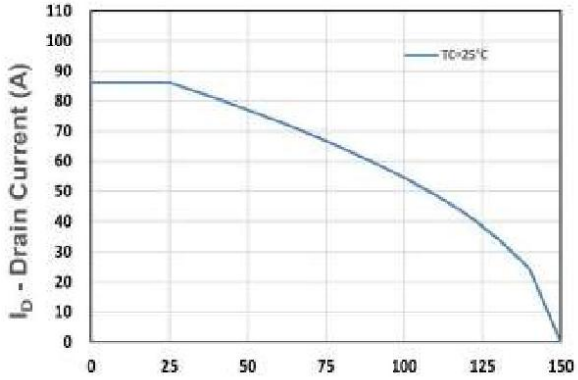


Figure 10. Drain Current

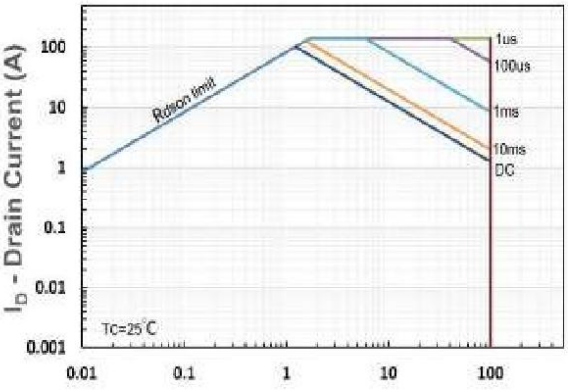


Figure 11. Safe Operating Area

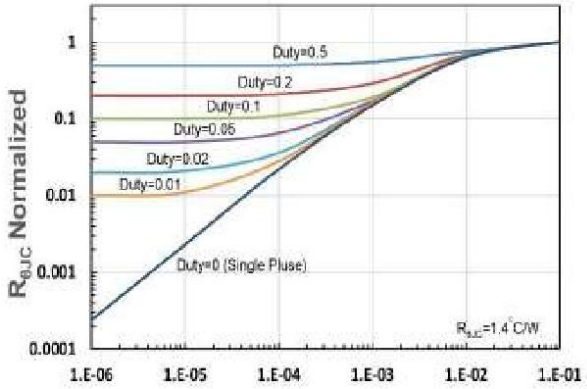
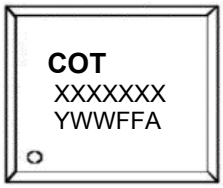


Figure 12. RθJC Transient Thermal Impedance

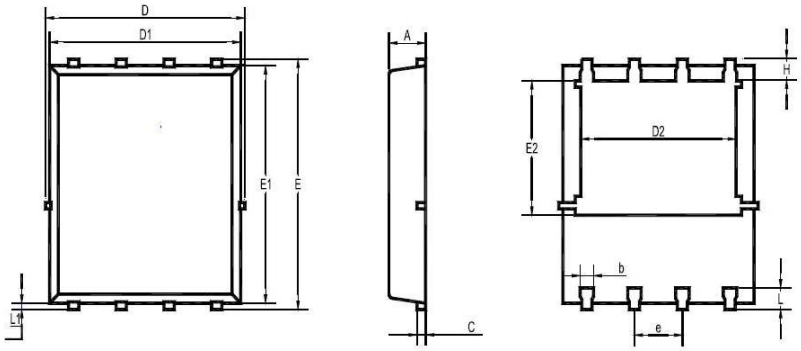
»Marking Information



Package	PDFN5x6	
XXXX	Part Number	
Y	Year	F=2020 , G=2021, ……
WW	Weeks	Ex. 10/27=44weeks, 11/3=45weeks
FF	Wafer lot	Lot No.
A	Serial	Serial No.
Dot	First pin	

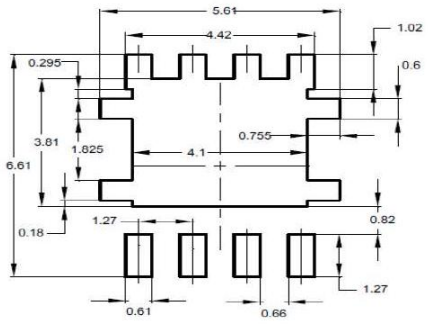
Package Outline Dimensions (Units: mm)

PDFN5x6



UNIT	A	b	C	D	D1	D2	E	E1	E2	e	L	L1	H
mm	1.12	0.51	0.34	5.26	5.1	4. 5	6.25	6	3.66	1.37	0.71	0.2	0.71
	0.9	0.33	0.11	4.7	4.7	3.56	5.75	5.6	3.18	1.17	0.35	0.06	0.35

Recommended Soldering Footprint



Packing information

Package	Tape Width (mm)	Pitch		Reel Size		Per Reel Packing Quantity
		mm	inch	mm	inch	
PDFN5x6	12	8 ± 0.1	0.315 ± 0.004	330	13	5,000