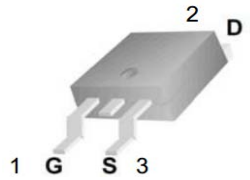
CTKD30N10

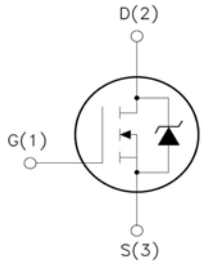
100V N-Channel MOSFET

Features:

- ☐ Low Intrinsic Capacitances.
- ☐ Excellent Switching Characteristics.
- ☐ Extended Safe Operating Area.
- ☐ Unrivalled Gate Charge :Qg= 61.7nC (Typ.).
- ☐ BVDSS=100V,I_D=30A
- ☐ R_{DS}(on) : 0.043Ω (Typ) @V_G=10V
- ☐ 100% Avalanche Tested

TO-252





1.Gate (G)
2.Drain (D)
3.Sourse (S)

Absolute Maximum Ratings* (Tc=25℃ Unless otherwise noted)

Symbol	PARAMETER		Value	Unit
V_{DSS}	Drain-Source Voltage		100	V
I_D	Drain Current	T_C=25℃	30	A
		T_C=100℃	21	
$V_{GS(TH)}$	Gate Threshold Voltage		±20	V
E_{AS}	Single Pulse Avalanche Energy (note1)		256	mJ
I_{AR}	Avalanche Current (note2)		30	A
P_D	Power Dissipation (Tc=25℃)		85	W
T_j	Junction Temperature(MAX)		175	℃
T_{stg}	Storage Temperature		-55~+175	℃
TL	Maximum lead temperature for soldering purpose,1/8” from case for 5 seconds		300	℃

Thermal Characteristics

Symbol	PARAMETER	Typ.	MAX.	Unit
$R_{\theta JC}$	Thermal Resistance,Junction to Case	-	1.8	℃/W
$R_{\theta JA}$	Thermal Resistance,Junction to Ambient	-	65	℃/W
$R_{\theta CS}$	Thermal Resistance,Case to Sink	-	110	℃/W

Electrical Characteristics (T_C=25℃unless otherwise noted)

Symbol	Parameter	Condition	Min	Typ	Max	Unit
Off Characteristics						
BV_{DSS}	Drain-Source Breakdown Voltage	V_{GS}=0V I_D=250μA	100	-	-	V
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS}=100V,V_{GS}=0V	-	-	1	μA
I_{GSS}	Gate-Body Leakage Current	V_{GS}=±20V,V_{DS}=0V	-	-	±100	nA
On Characteristics (Note 3)						
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS}=V_{GS},I_D=250μA	1.3	1.8	2.5	V
$R_{DS(ON)}$	Drain-Source On-State Resistance	V_{GS}=10V, I_D=20A	-	43	46	mΩ
g_{FS}	Forward Transconductance	V_{DS}=5V,I_D=10A	-	15	-	S
Dynamic Characteristics (Note4)						
C_{lss}	Input Capacitance	V_{DS}=50V,V_{GS}=0V, F=1.0MHz	-	2356	-	PF
C_{oss}	Output Capacitance		-	94	-	PF
C_{rss}	Reverse Transfer Capacitance		-	83.3	-	PF
Switching Characteristics (Note 4)						
$t_{d(on)}$	Turn-on Delay Time	V_{DD}=50V,R_L=5Ω V_{GS}=10V,R_{GEN}=3Ω	-	7	-	nS
t_r	Turn-on Rise Time		-	7	-	nS
$t_{d(off)}$	Turn-Off Delay Time		-	29	-	nS
t_f	Turn-Off Fall Time		-	7	-	nS
Q_g	Total Gate Charge	V_{DS}=50V,I_D=10A, V_{GS}=10V	-	61.7	-	nC
Q_{gs}	Gate-Source Charge		-	8.3	-	nC
Q_{gd}	Gate-Drain Charge		-	16.7	-	nC
Drain-Source Diode Characteristics						
V_{SD}	Diode Forward Voltage (Note 3)	V_{GS}=0V,I_S=10A	-	-	1.2	V
I_S	Diode Forward Current (Note 2)	-	-	-	30	A
t_{rr}	Reverse Recovery Time	TJ = 25°C, IF = 10A di/dt = 100A/μs (Note3)	-	32	-	nS
Qrr	Reverse Recovery Charge		-	53	-	nC
t_{on}	Forward Turn-On Time	Intrinsic turn-on time is negligible (turn-on is dominated by LS+LD)				

Notes:

1. Repetitive Rating: Pulse width limited by maximum junction temperature.
2. Surface Mounted on FR4 Board, t ≤ 10 sec.
3. Pulse Test: Pulse Width ≤ 300μs, Duty Cycle ≤ 2%.
4. Guaranteed by design, not subject to production
5. EAS Condition : Tj=25℃,V_{DD}=50V,V_G=10V,L=0.5mH,Rg=25Ω, I_{AS}=32A

Typical Characteristics

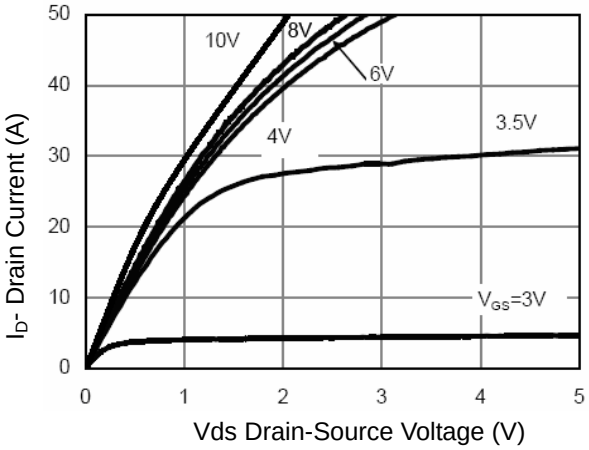


Figure 1 Output Characteristics

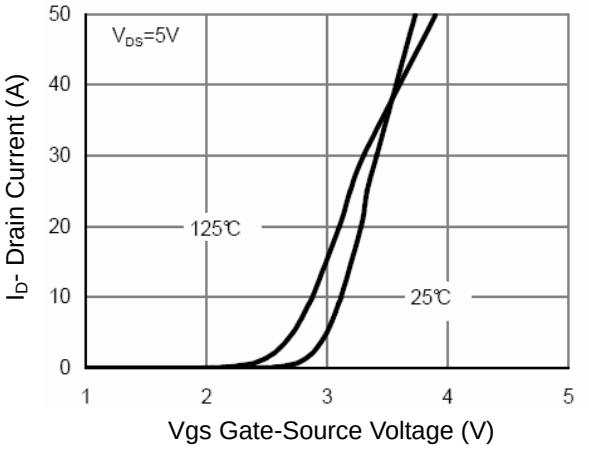


Figure 2 Transfer Characteristics

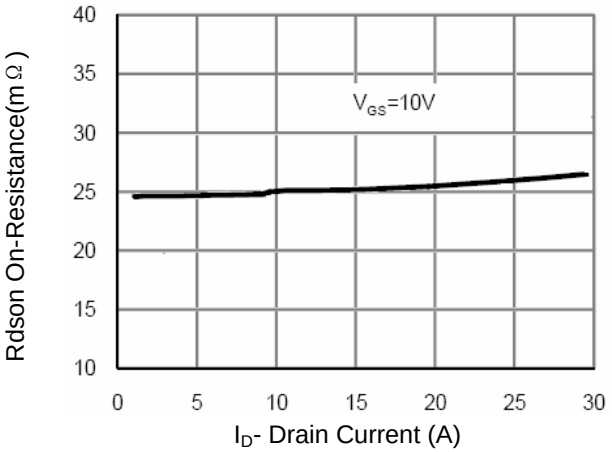


Figure 3 Rdson- Drain Current

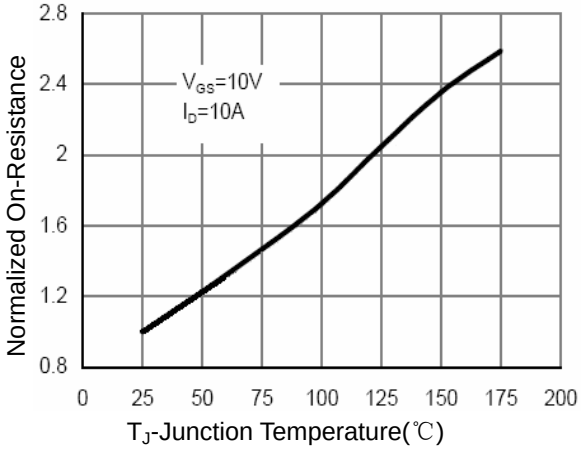


Figure 4 Rdson-JunctionTemperature

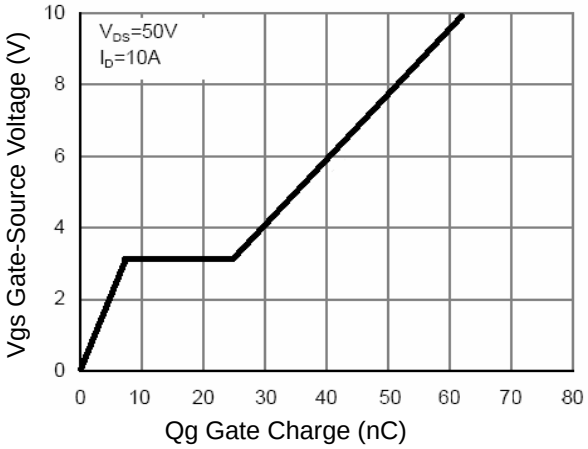


Figure 5 Gate Charge

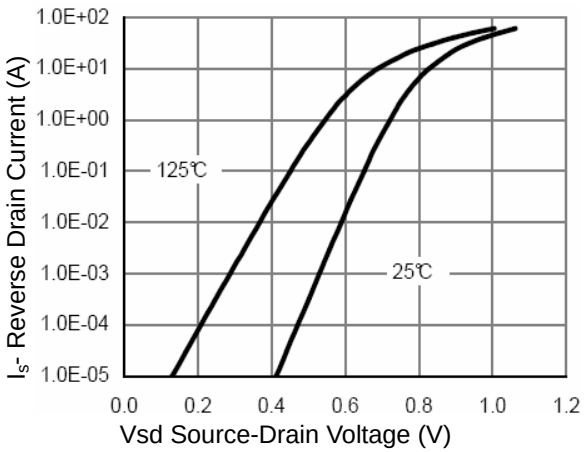


Figure 6 Source- Drain Diode Forward

Typical Characteristics (Continued)

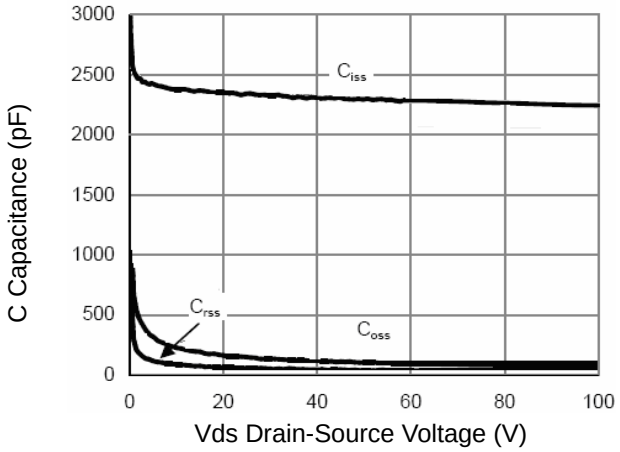


Figure 7 Capacitance vs Vds

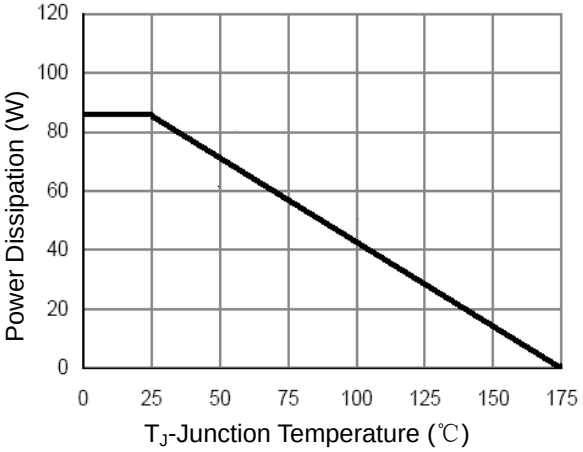


Figure 9 Power De-rating

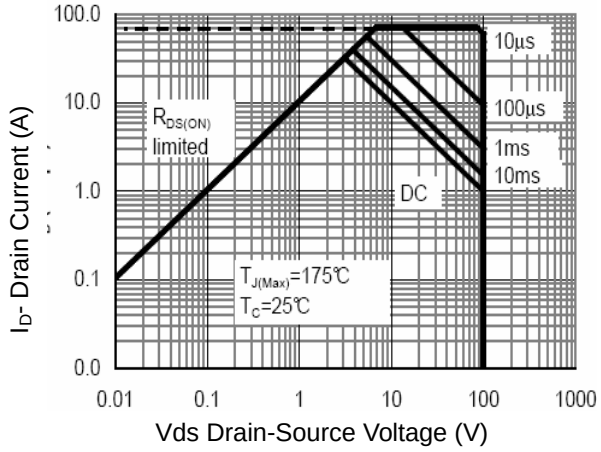


Figure 8 Safe Operation Area

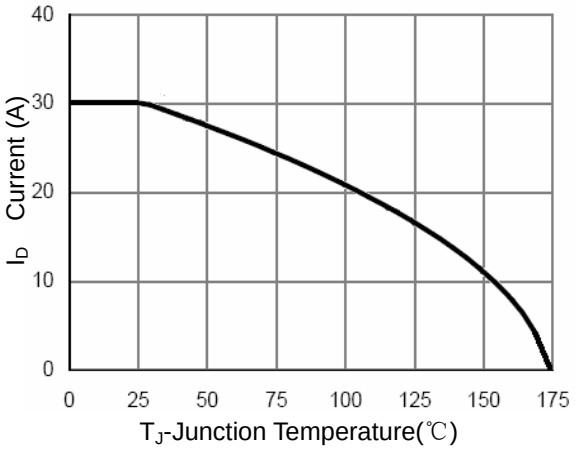


Figure 10ID Current- Junction Temperature

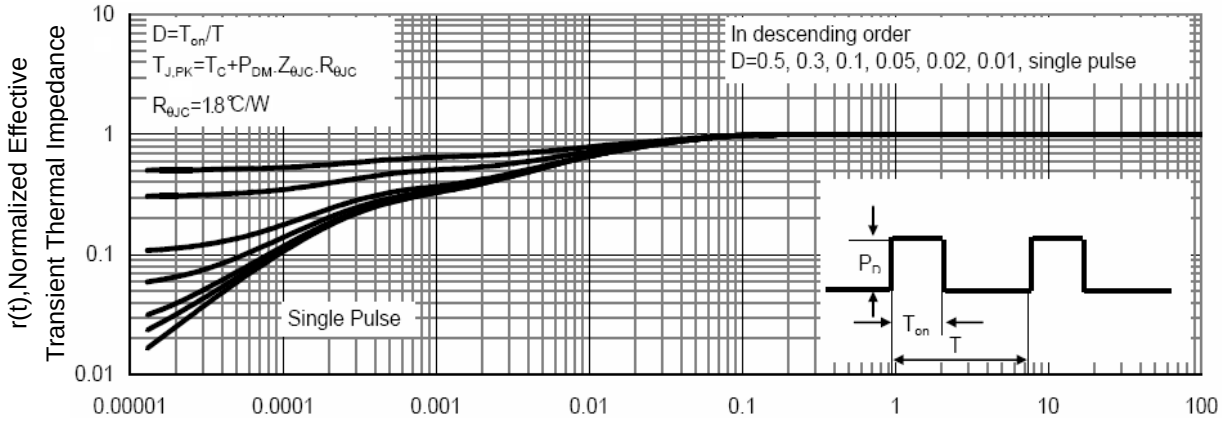
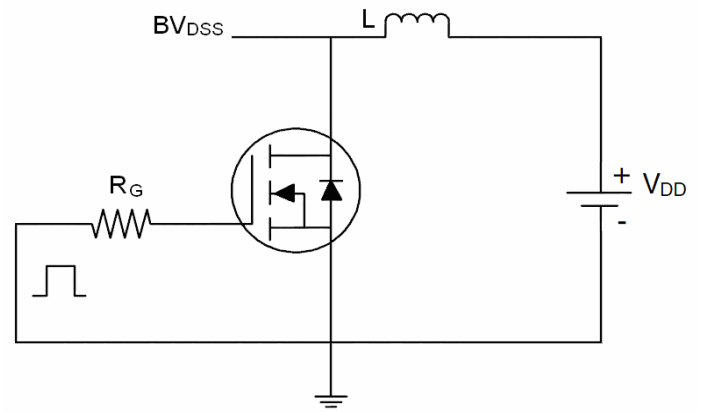


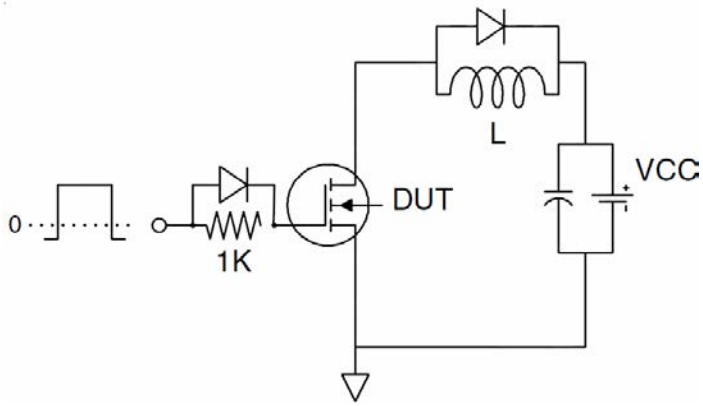
Figure 11 Normalized Maximum Transient Thermal Impedance

Test Circuit

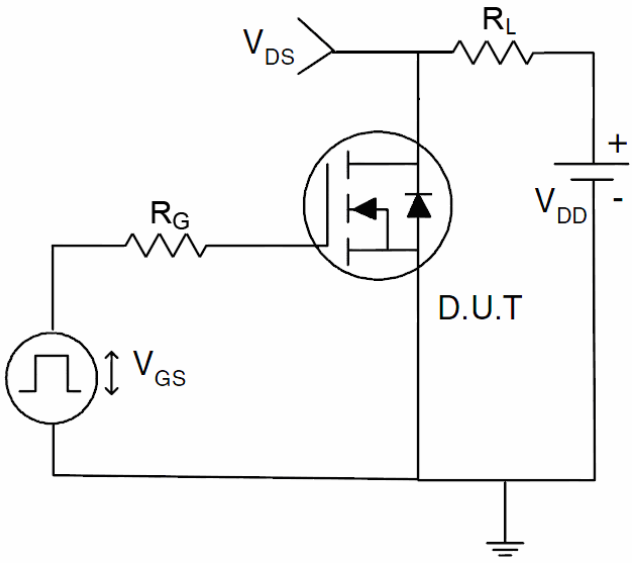
1) $_{AS}$ Test Circuit



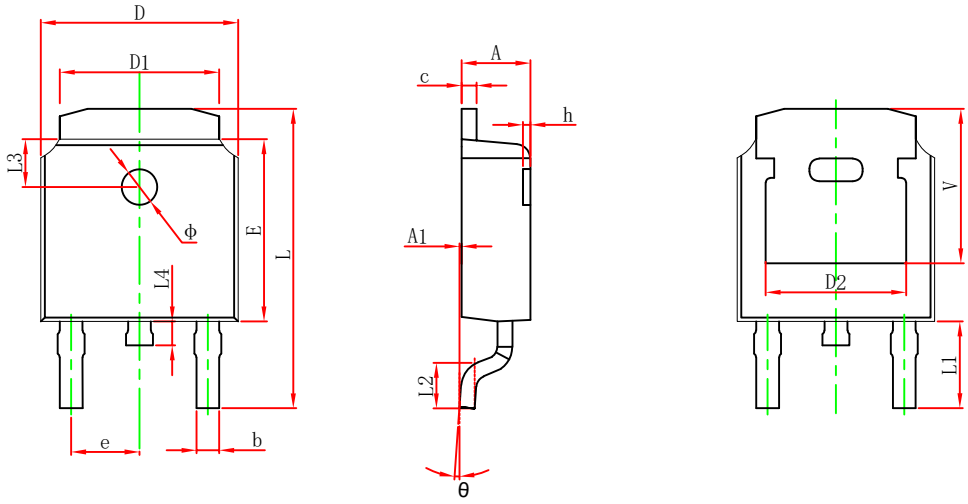
2) Gate C rge Test Circuit



3) witch Time Test Circuit

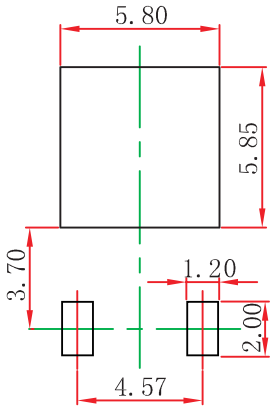


Package Dimension



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	2.200	2.400	0.087	0.094
A1	0.000	0.127	0.000	0.005
b	0.700	0.860	0.025	0.030
c	0.460	0.580	0.018	0.023
D	6.500	6.700	0.256	0.264
D1	5.100	5.460	0.201	0.215
D2	4.830 REF.		0.190 REF.	
E	6.000	6.300	0.236	0.244
e	2.186	2.386	0.086	0.094
L	9.712	10.312	0.382	0.406
L1	2.900 REF.		0.114 REF.	
L2	1.400	1.700	0.055	0.067
L3	1.600 REF.		0.063 REF.	
L4	0.600	1.000	0.024	0.039
Φ	1.100	1.300	0.043	0.051
θ	0°	8°	0°	8°
h	0.000	0.300	0.000	0.012
V	5.250 REF.		0.207 REF.	

TO-252-2L Suggest Pad Layout



NOTE:

1. Controlling dimension: in millimeters.
2. General tolerance: ±0.05mm.
3. The pad layout is for reference purposes only.