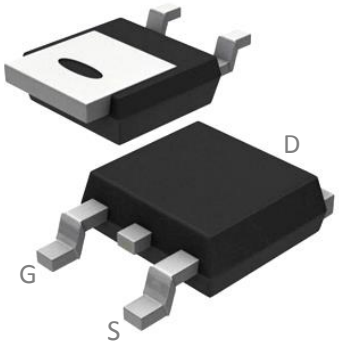
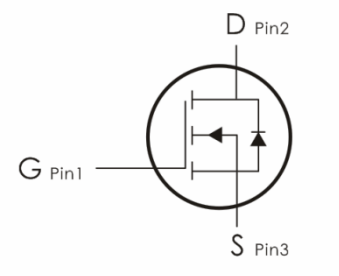
Description：

This N-Channel MOSFET uses advanced trench 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}=40V,I_D=40A,$R_{DS(ON)}$<17mΩ @V_{GS}=10V
2) Low gate charge.
3) Green device available.
4) Advanced high cell denity trench technology for ultra $R_{DS(ON)}$.
5) Excellent package for good heat dissipation.

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

Symbol	Parameter	Ratings	Units
V_{DS}	Drain-Source Voltage	40	V
V_{GS}	Gate-Source Voltage	±20	V
I_D	Continuous Drain Current-T_C=25℃	40	A
	Continuous Drain Current-T_C=100℃	30	
I_{DM}	Pulsed Drain Current[1]	200	
E_{AS}	Single Pulse Avalanche Energy[2]	64	mJ
P_D	Power Dissipation,T_C=25℃	89	W
T_J, T_{STG}	Operating and Storage Junction Temperature Range	-55 to +175	℃

Package Marking and Ordering Information：

Part NO.	Marking	Package
FTD04N40ND	FTD04N40ND	TO-252

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	40	---	---	V
I_{DSS}	Zero Gate Voltage Drain Current	V_{GS}=0V, V_{DS}=60V	---	---	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	2.5	V
$R_{DS(ON)}$	Drain-Source On Resistance[3]	V_{GS}=10V,I_D=30A	---	12	17	mΩ
		V_{GS}=4.5V,I_D=20A	---	16	25	
Dynamic Characteristics						
C_{iss}	Input Capacitance	V_{DS}=25V, V_{GS}=0V, f=1MHz	---	2900		pF
C_{oss}	Output Capacitance		---	140		
C_{rss}	Reverse Transfer Capacitance		---	124		
Switching Characteristics						
$t_{d(on)}$	Turn-On Delay Time	V_{DD}=25V, I_D=30A, V_{GS}=10V,R_{GEN}=1.8Ω	---	7.4		ns
t_r	Rise Time		---	5.1		ns
$t_{d(off)}$	Turn-Off Delay Time		---	28.2		ns
t_f	Fall Time		---	5.5		ns
Q_g	Total Gate Charge	V_{GS}=10V, V_{DS}=30V, I_D=30A	---	50		nC
Q_{gs}	Gate-Source Charge		---	6		nC
Q_{gd}	Gate-Drain “Miller” Charge		---	15		nC
Drain-Source Diode Characteristics						
V_{SD}	Source-Drain Diode Forward Voltage	V_{GS}=0V,I_S=30A	---	---	1.2	V
Is	Continuous Source Current			---	40	A
I_{SM}	Pulsed Source Current			---	200	A
trr	Reverse Recovery Time	I_F=30A, dI/dt=100A/μs		28	---	Ns
qrr	Reverse Recovery Charge			40	---	nc

Notes:1. Repetitive Rating: Pulse Width Limited by Maximum Junction Temperature

2. EAS condition : T_J=25℃,V_{DD}=30V,V_G=10V,L=0.5mH,Rg=25 ,I_{AS}=16A

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

Typical Characteristics：

(T_C=25℃ unless otherwise noted)

FIGURE1:OUTPUT CHARACTERISTICS

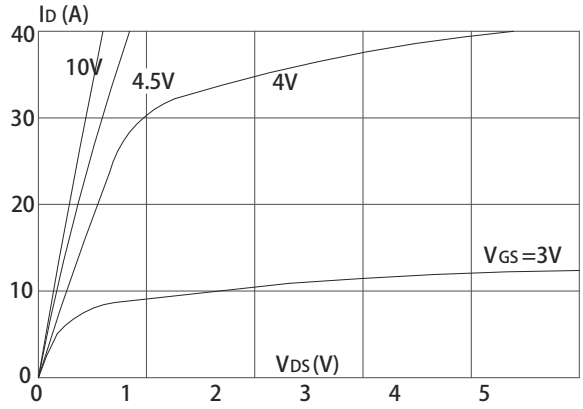


FIGURE 2: TYPICAL TRANSFER CHARACTERISTICS

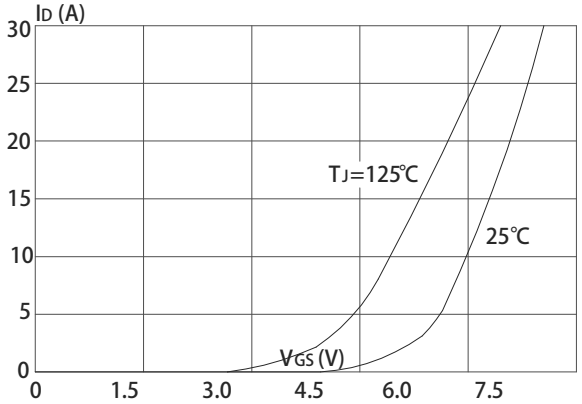


FIGURE 3:ON-RESISTANCE VS. DRAIN CURRENT

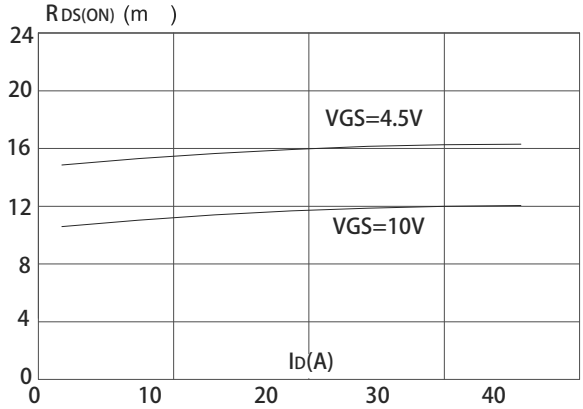


FIGURE 4 BODY DIODE CHARACTERISTICS

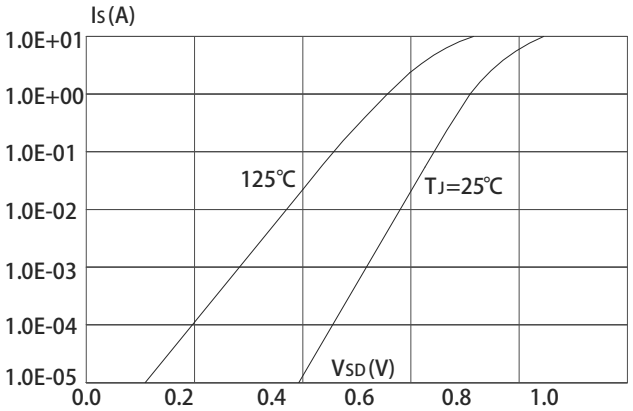


FIGURE 5:GATE CHARGE CHARACTERISTICS

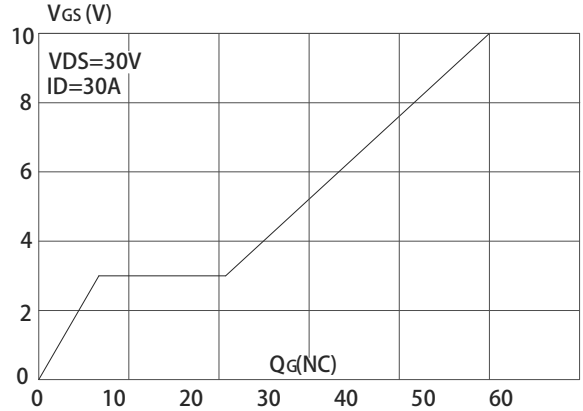


FIGURE 6:CAPACITANCE CHARACTERISTICS

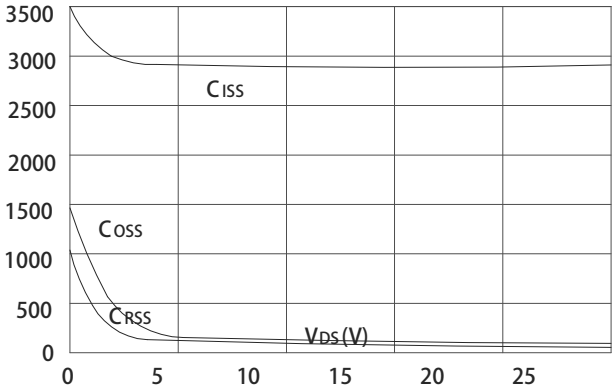


Figure 7: Normalized Breakdown Voltage vs. Junction Temperature

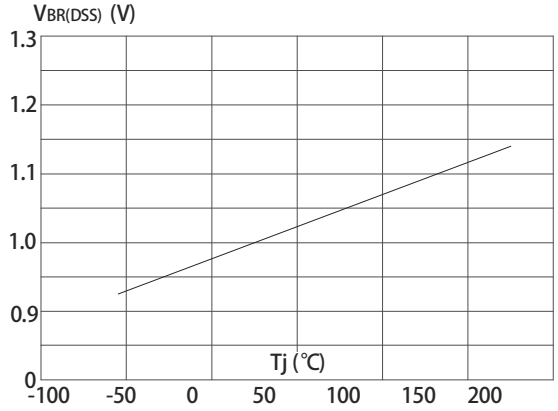


Figure 8: Normalized on Resistance vs. Junction Temperature

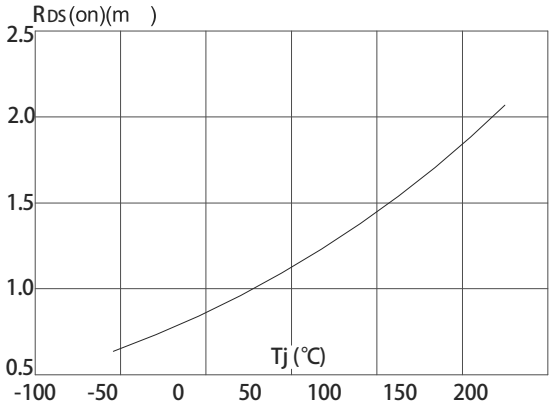


Figure 9: Maximum Safe Operating Area

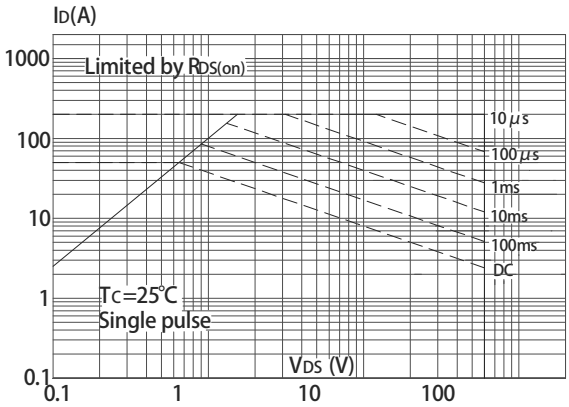


Figure 10: Maximum Continuous Drain Current vs. Case Temperature

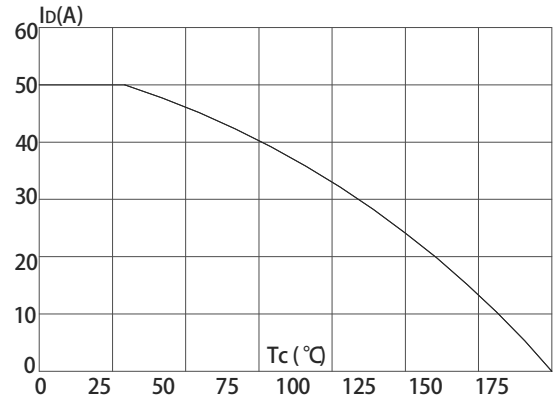


Figure.11: Maximum Effective Transient Thermal Impedance, Junction-to-Case