



N-Channel Enhancement Mode Field Effect Transistor

Product Summary

V_{DS}	60V
I_D	260mA
$R_{DS(ON)}$ (at $V_{GS}=10V$)	2.5ohm
$R_{DS(ON)}$ (at $V_{GS}=4.5V$)	3.0ohm
Gate-Source ESD Rating Up to 2KV (HBM)	

General Description

Trench Power MV MOSFET technology
Voltage controlled small signal switch
Low input Capacitance
Fast Switching Speed
Low Input / Output Leakage
Moisture Sensitivity Level 3
Epoxy Meets UL 94 V-0 Flammability Rating
Halogen Free

Applications

Battery operated systems
Solid-state relays
Direct logic-level interface TTL/CMOS

Absolute Maximum Ratings ($T_A=25$ unless otherwise noted)



2N7002KCL3

Electrical Characteristics (T_J=25 unless otherwise noted)

Parameter	Symbol	Conditions	Min	Typ	Max	Units
Static Parameter						
Drain-Source Breakdown Voltage	BV _{DSS}	V _{GS} = 0V, I _D =250	60			V
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} =60V, V _{GS} =0V			1	
Gate-Body Leakage Current	I _{GSS}	V _{GS} = 20V, V _{DS} =0V			10	
Gate Threshold Voltage	V _{GS(th)}	V _{DS} = V _{GS} , I _D =250	1	1.5	2.5	V
Static Drain-Source On-Resistance	R _{DS(on)}	V _{GS} = 10V, I _D =260mA		1.9	2.5	
		V _{GS} = 4.5V, I _D =200mA		2.0	3.0	
Diode Forward Voltage	V _{SD}	I _S =260mA, V _{GS} =0V		0.9	1.2	V
Maximum Body-Diode Continuous Current	I _S				260	mA
Forward Transconductance	g _{FS}	V _{DS} =5V, I _D =0.26A		0.13		S
Dynamic Parameters						
Input Capacitance	C _{iss}	V _{DS} =30V, V _{GS} =0V, f=1MHZ		21		pF
Output Capacitance	C _{oss}			9		
Reverse Transfer Capacitance	C _{rss}			4		
Switching Parameters						
Total Gate Charge	Q _g	V _{GS} =10V, V _{DS} =30V, I _D =0.26A		1.22		nC
Gate-Source Charge	Q _{gs}			0.5		
Gate-Drain Charge	Q _{gd}			0.18		
Reverse Recovery Charge	Q _{rr}	V _{GS} =0V, I _S =260mA, V _R =25V, di/dt=100A/ s		3.6		
Reverse Recovery Time	t _{rr}			16		
Turn-on Delay Time	t _{D(on)}	V _{GS} =10V, V _{DD} =50V, I _D =260mA, R _{GEN} =50		7		ns
Turn-on Rise Time	t _r			19		
Turn-off Delay Time	t _{D(off)}			20		
Turn-off fall Time	t _f			84		

A. Pulse Test: Pulse Width 300us, Duty cycle 2%.

B. Device mounted on FR-4 PCB, 1 inch x 0.85 inch x 0.062 inch.



Typical Performance Characteristics

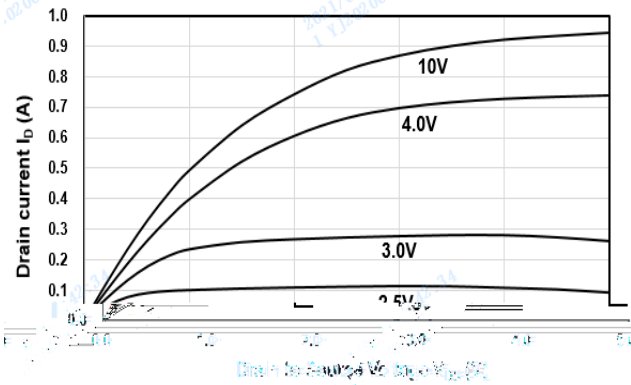


Figure1. Output Characteristics

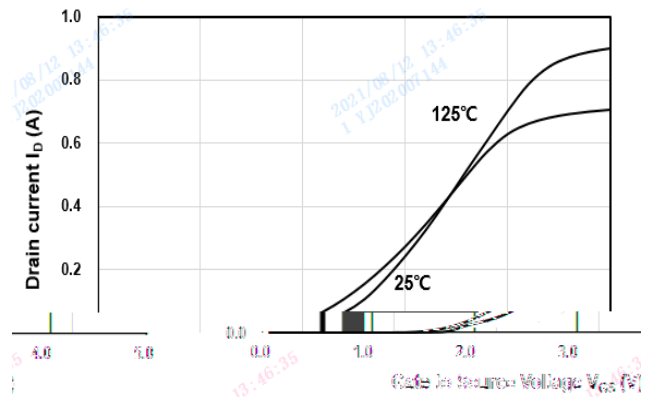


Figure2. Transfer Characteristics

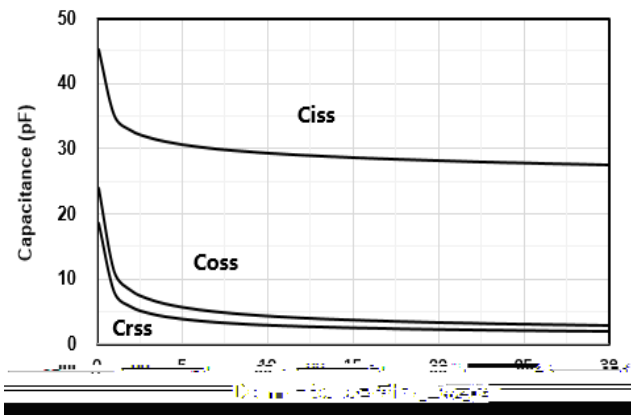


Figure3. Capacitance Characteristics

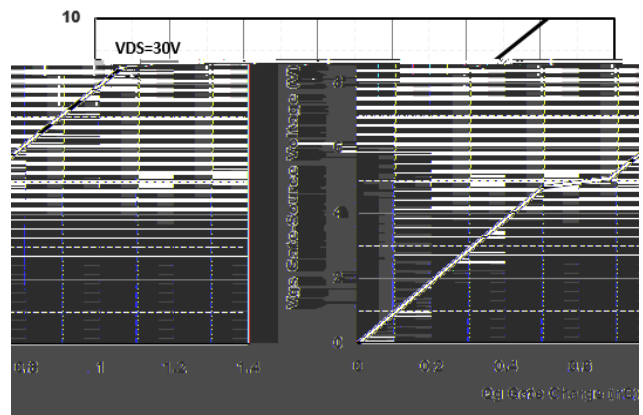


Figure4. Gate Charge

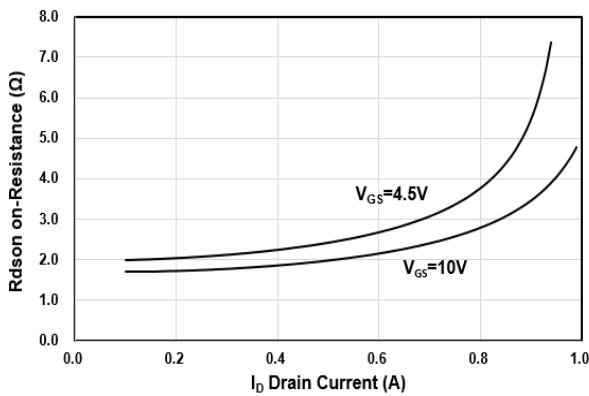


Figure5. Drain-Source on Resistance

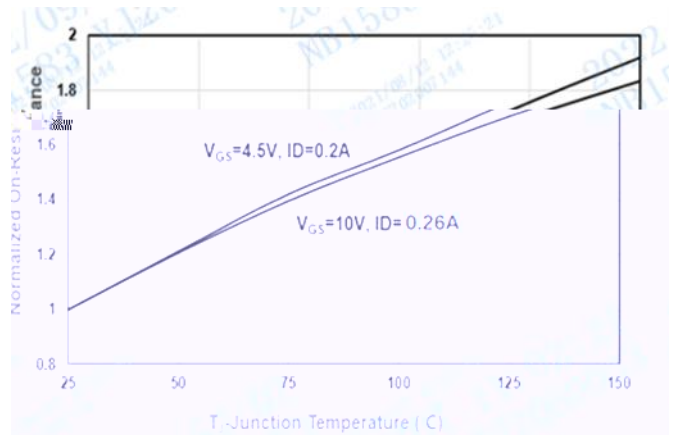


Figure6. Drain-Source on Resistance

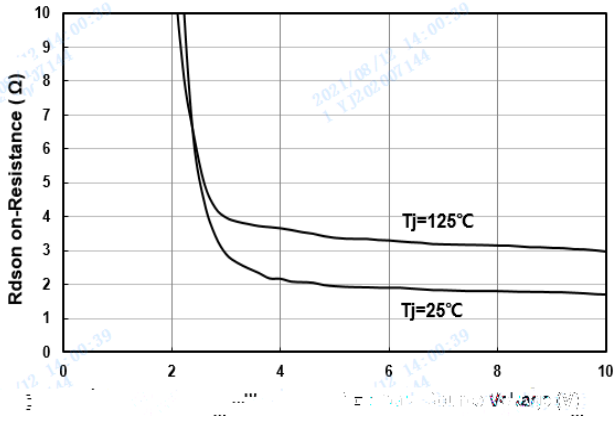


Figure7. On-Resistance vs V_{GS}

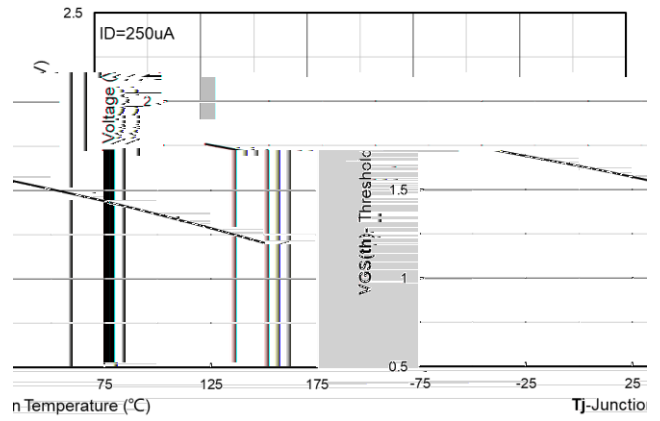


Figure8. Threshold Voltage vs Temperature

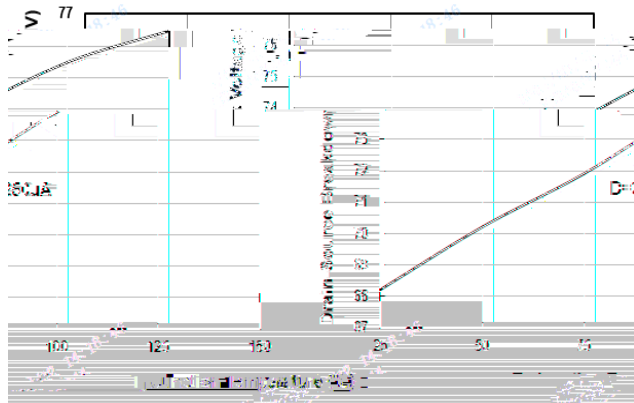


Figure9. Breakdown Voltage vs Temperature

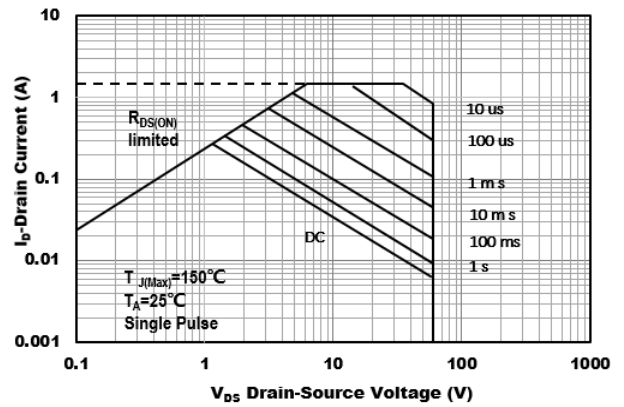


Figure10. Safe Operation Area

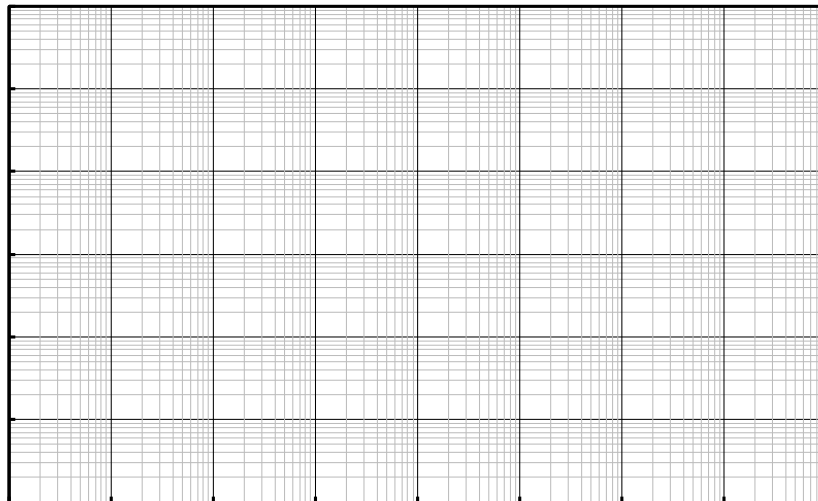
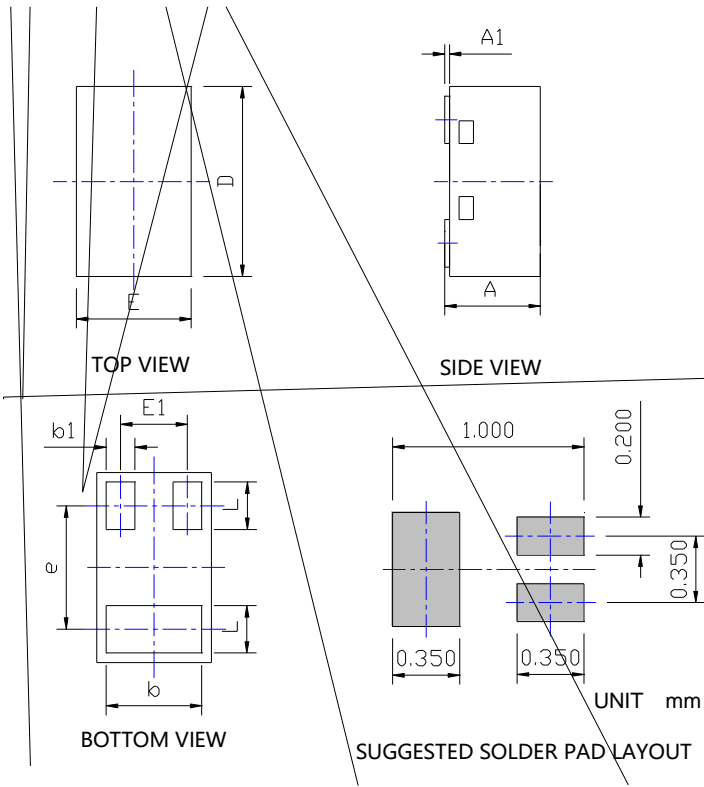


Figure11. Maximum Transient Thermal Impedance



2N7002KCL3

DFN1006-3L Package information



DIMENSIONS			
Millimeter			
	MIN.	MAX.	
	0.42	0.55	
	0.025REF		
	0.45		0.55
	0.10		0.20
	0.95		1.05
	0.55		0.65
	0.65BSC		
e			
L	0.20		0.30



2N7002KCL3

Disclaimer

The information presented in this document is for reference only. Yangzhou Yangjie Electronic Technology Co., Ltd. reserves the right to make changes without notice for the specification of the products displayed herein to improve reliability, function or design or otherwise.

The product listed herein is designed to be used with ordinary electronic equipment or devices, and not designed to be used with equipment or devices which require high level of reliability and the malfunction of which would directly endanger human life (such as medical instruments, transportation equipment, aerospace machinery, nuclear-reactor controllers, fuel controllers and other safety devices), Yangjie or anyone on its behalf, assumes no responsibility or liability for any damages resulting from such improper use of sale.

This publication supersedes & replaces all information previously supplied. For additional information, please visit our website [http:// www.21yangjie.com](http://www.21yangjie.com)