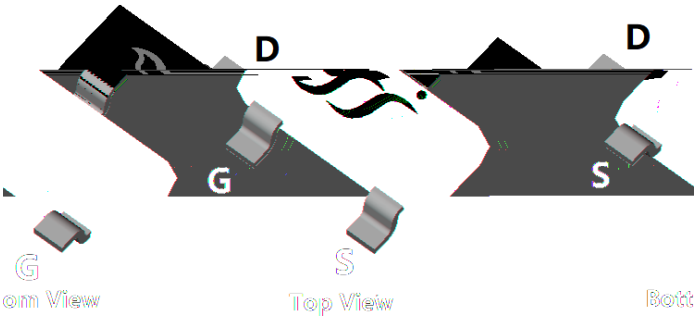
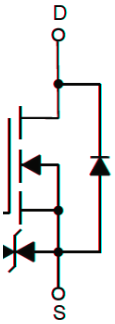
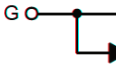
N-Channel Enhancement Mode Field Effect Transistor





SOT-23



Product Summary

V_{DS}	60V
I_D	300mA
$R_{DS(ON)}$(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 1
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)

Parameter		Symbol	Limit	Unit
Drain-source Voltage		V_{DS}	60	V
Gate-source Voltage		V_{GS}	20	V
Drain Current	T_A=25 @ Steady State	I_D	300	mA
	T_A=70 @ Steady State		240	
Pulsed Drain Current [A]		I_{DM}	1.5	A
Total Power Dissipation @ T_A=25		P_D	300	mW
Thermal Resistance Junction-to-Ambient @ Steady State [B]		R_{JA}	416	/ W
Junction and Storage Temperature Range		T_J ,T_{STG}	-55 +150	

Ordering Information (Example)

PREFERED P/N	PACKING CODE	Marking	MINIMUM PACKAGE(pcs)	INNER BOX QUANTITY(pcs)	OUTER CARTON QUANTITY(pcs)	DELIVERY MODE
2N7002KC	F2	72KC.	3000	30000	120000	reel

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=300mA		1.9	2.5	
		V_{GS}= 4.5V, I_D=200mA		2.0	3.0	
Diode Forward Voltage	V_{SD}	I_S=300mA,V_{GS}=0V			1.2	V
Maximum Body-Diode Continuous Current	I_S				300	mA
Forward Transconductance	g_{FS}	V_{DS}=5V,I_D=0.3A		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=0.3A		1.22	2.4	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=300mA,V_R=25V, di/dt=100A/ s		3.6		
Reverse Recovery Time	t_{rr}			16		ns
Turn-on Delay Time	$t_{D(on)}$	V_{GS}=10V,V_{DD}=50V, I_D=200mA, R_{GEN}=50		7		
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

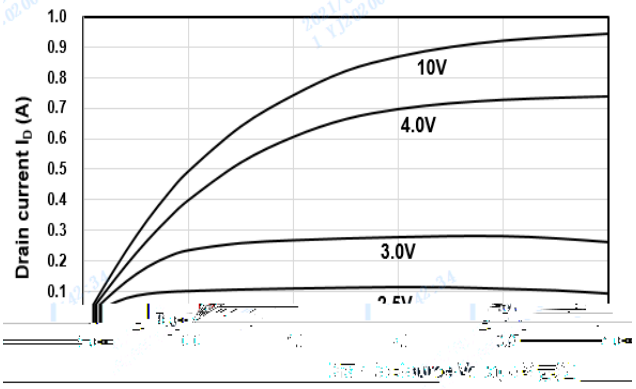


Figure1. Output Characteristics

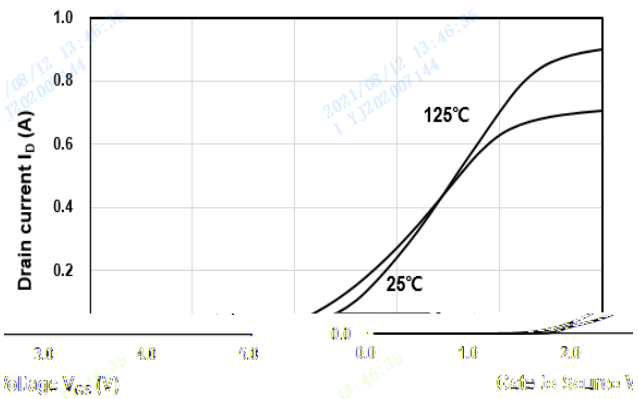


Figure2. Transfer Characteristics

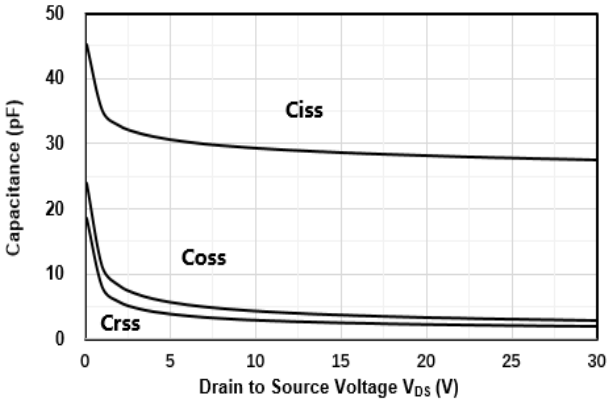


Figure3. Capacitance Characteristics

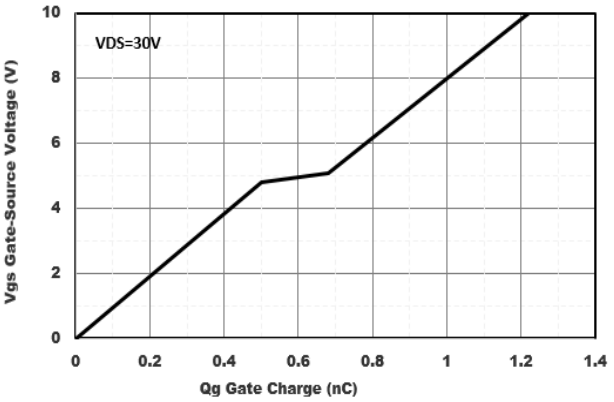


Figure4. Gate Charge

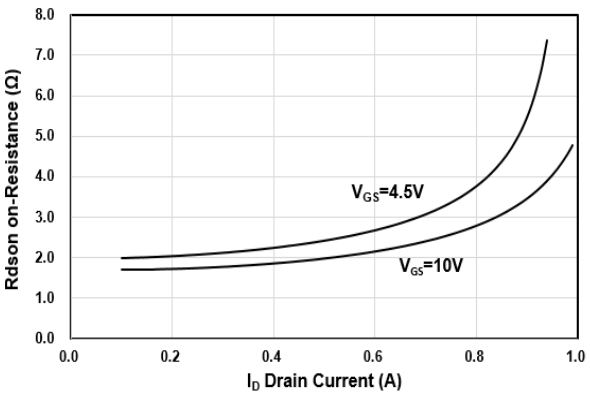


Figure5. Drain-Source on Resistance

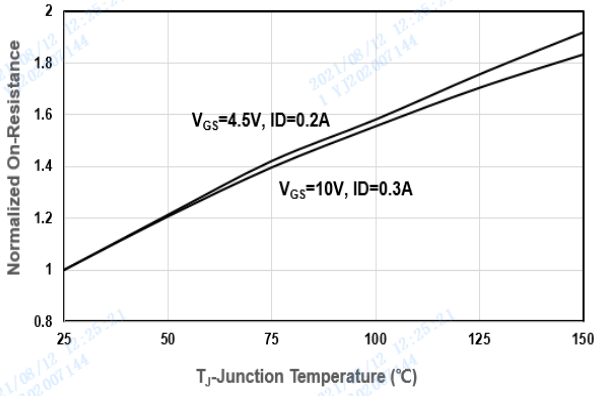


Figure6. Drain-Source on Resistance

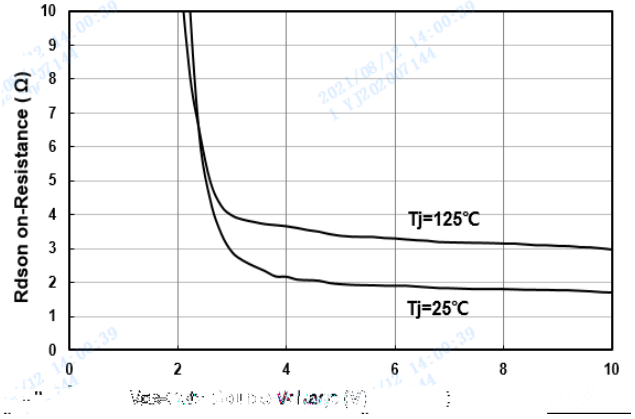


Figure7. On-Resistance vs V_{GS}

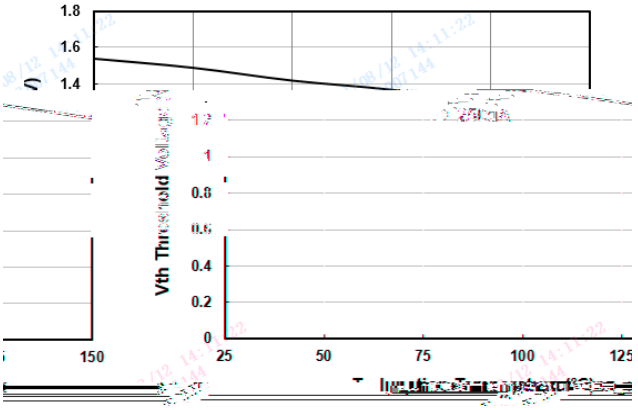


Figure8. Threshold Voltage vs Temperature

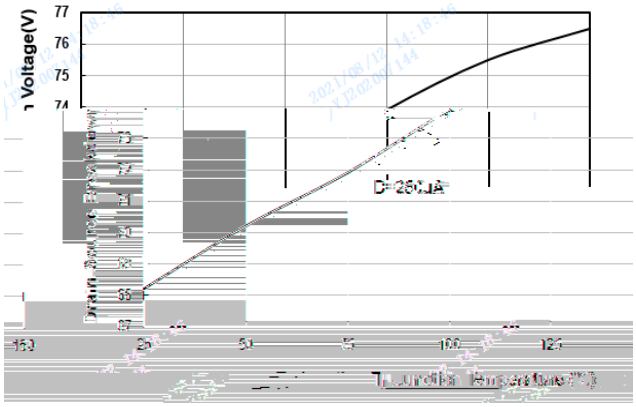


Figure9. Breakdown Voltage vs Temperature

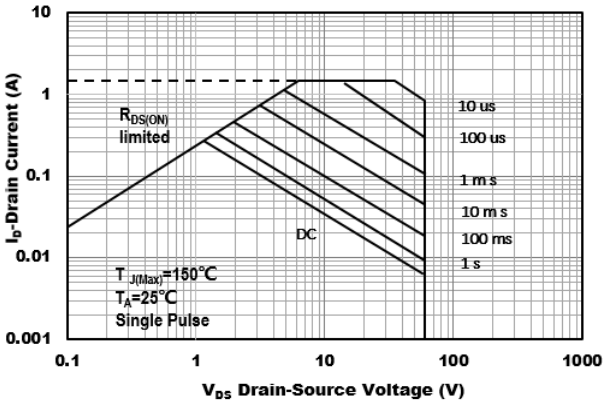


Figure10. Safe Operation Area

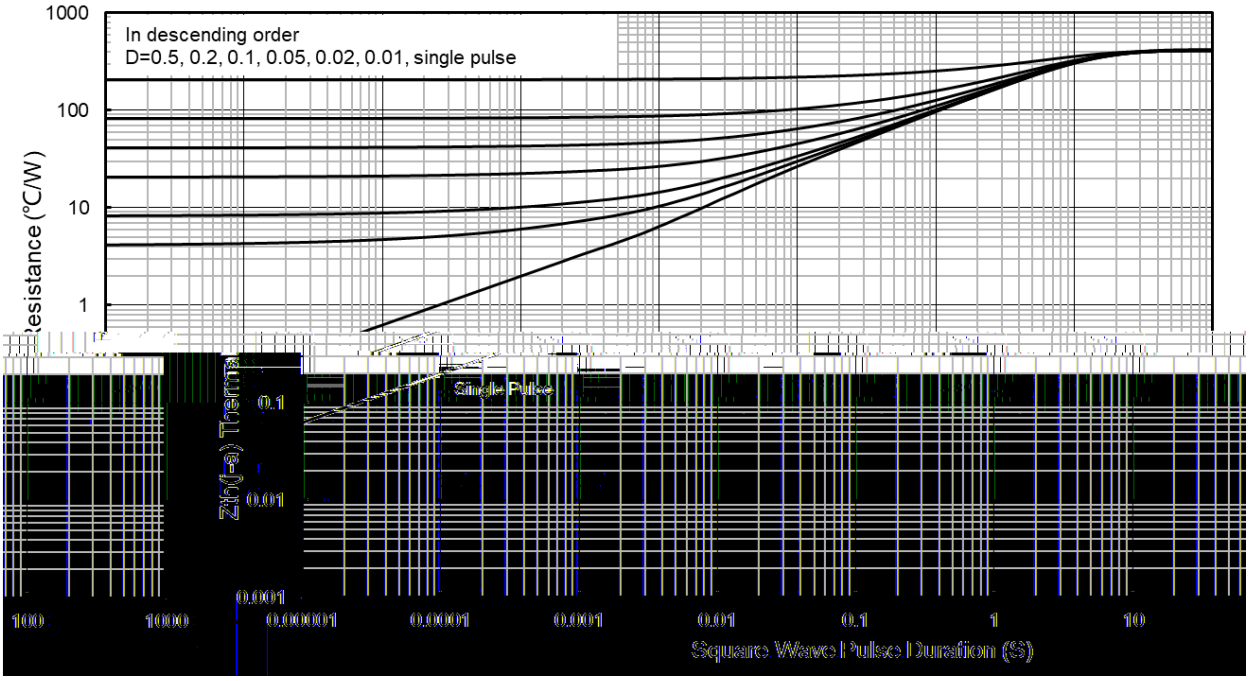
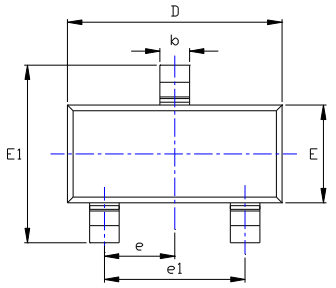
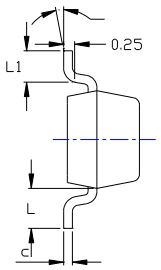


Figure11. Maximum Transient Thermal Impedance

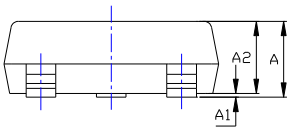
SOT-23 Package information

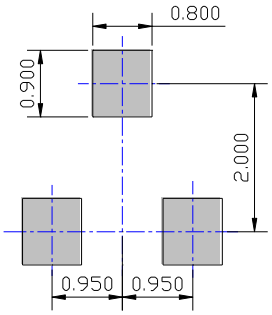




DIMENSIONS

SYMBOL	INCHES		Millimeter	
	MIN.	MAX.	MIN.	MAX.
A	0.035	0.		





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