

ELECTRICAL SPECIFICATIONS ($T_A = 25^\circ\text{C}$ unless otherwise noted)

PARAMETER	CONDITIONS	SYMBOL	MIN	TYP	MAX	UNIT
Static						
Drain-Source Breakdown Voltage	V _{GS} = 0V, I _D = 250μA	BV _{DSS}	30	--	--	V
Gate Threshold Voltage	V _{GS} = V _{DS} , I _D = 250μA	V _{GS(TH)}	0.4	0.75	0.9	V
Gate-Source Leakage Current	V _{GS} = ±12V, V _{DS} = 0V	I _{GSS}	--	--	±100	nA
Drain-Source Leakage Current	V _{GS} = 0V, V _{DS} = 30V	I _{DSS}	--	--	1	μA
	V _{GS} = 0V, V _{DS} = 30V T _J = 125°C		--	--	100	
	Drain-Source On-State Resistance (Note 2)		V _{GS} = 4.5V, I _D = 4A	R _{DS(on)}	--	
	V _{GS} = 2.5V, I _D = 4A	--	32		40	
Forward Transconductance (Note 2)	V _{DS} = 5V, I _D = 4A	g _{fs}	--	9.5	--	S
Dynamic (Note 3)						
Total Gate Charge	V _{GS} = 4.5V, V _{DS} = 15V, I _D = 4A	Q _g	--	8.9	--	nC
Total Gate Charge	V _{GS} = 2.5V, V _{DS} = 15V, I _D = 4A	Q _g	--	5.1	--	
Gate-Source Charge		Q _{gs}	--	1.5	--	
Gate-Drain Charge		Q _{gd}	--	2	--	
Input Capacitance	V _{GS} = 0V, V _{DS} = 15V f = 1.0MHz	C _{iss}	--	792	--	pF
Output Capacitance		C _{oss}	--	53	--	
Reverse Transfer Capacitance		C _{rss}	--	21	--	
Gate Resistance	f = 1.0MHz	R _g	--	1	--	Ω
Switching (Note 3)						
Turn-On Delay Time	V _{GS} = 10V, V _{DS} = 15V, I _D = 4A, R _G = 2Ω,	t _{d(on)}	--	5.8	--	ns
Turn-On Rise Time		t _r	--	32	--	
Turn-Off Delay Time		t _{d(off)}	--	19	--	
Turn-Off Fall Time		t _f	--	28	--	
Source-Drain Diode						
Forward Voltage (Note 2)	V _{GS} = 0V, I _S = 4A	V _{SD}	--	--	1	V
Reverse Recovery Time	I _S = 4A , di/dt = 100A/μs	t _{rr}	--	8	--	ns
Reverse Recovery Charge		Q _{rr}	--	3.3	--	nC

Notes:

1. Silicon limited current only.
2. Pulse test: Pulse Width $\leq 300\mu s$, duty cycle $\leq 2\%$.
3. Switching time is essentially independent of operating temperature.

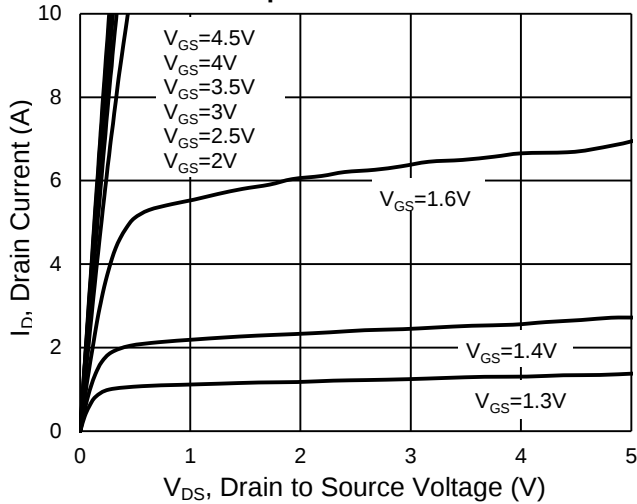
ORDERING INFORMATION

ORDERING CODE	PACKAGE	PACKING
TSM320N03CX RFG	SOT-23	3,000pcs / 7" Reel

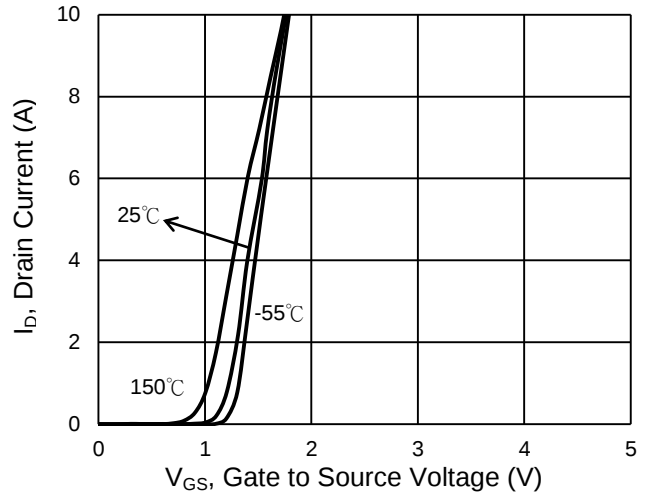
CHARACTERISTICS CURVES

($T_A = 25^\circ\text{C}$ unless otherwise noted)

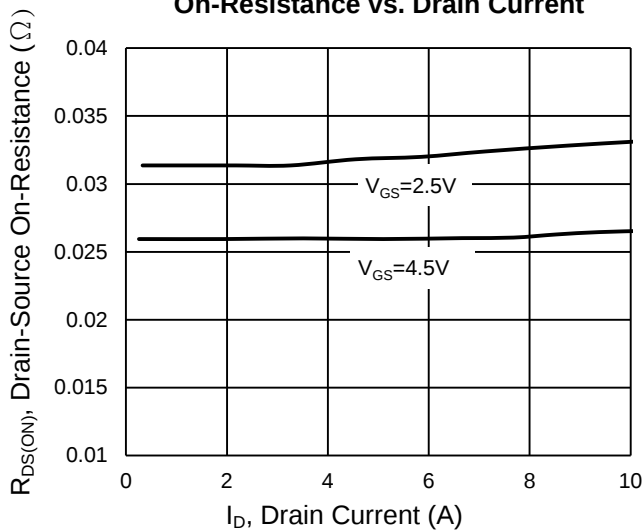
Output Characteristics



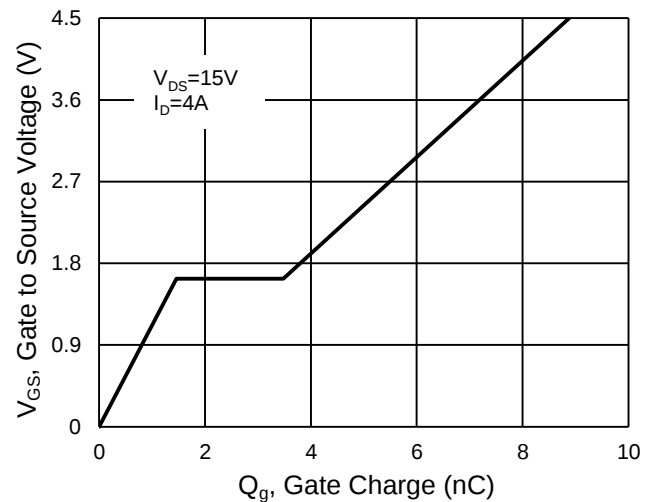
Transfer Characteristics



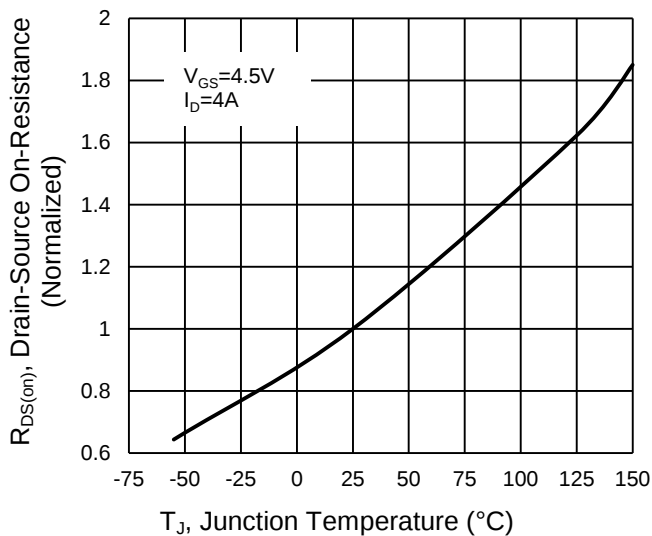
On-Resistance vs. Drain Current



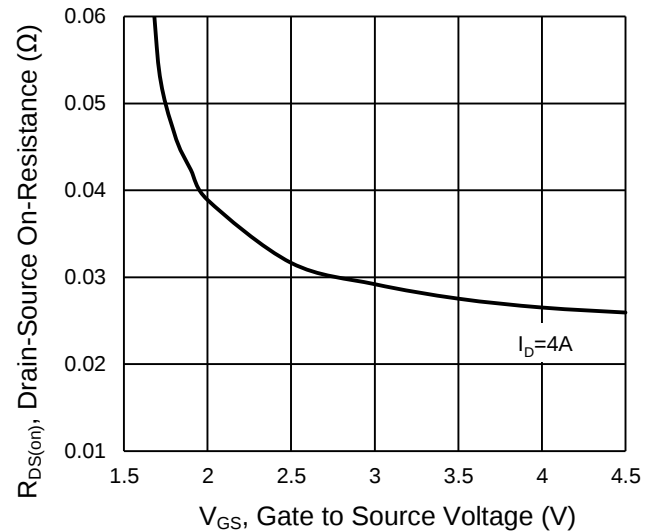
Gate-Source Voltage vs. Gate Charge



On-Resistance vs. Junction Temperature



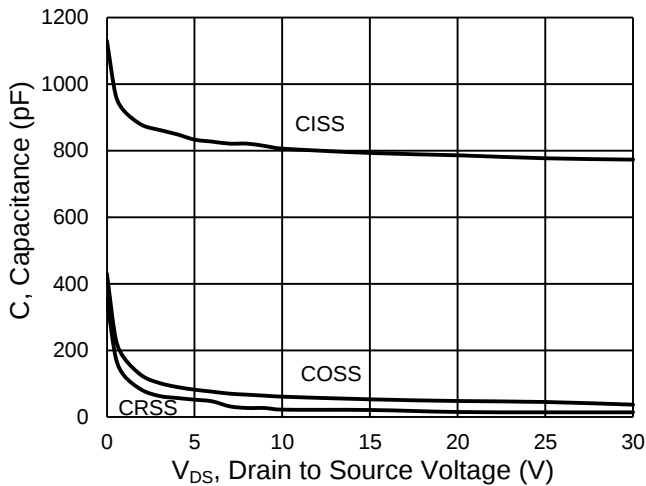
On-Resistance vs. Gate-Source Voltage



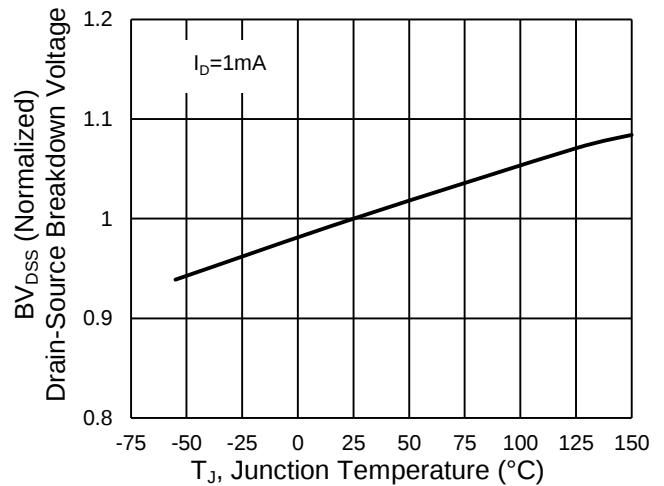
CHARACTERISTICS CURVES

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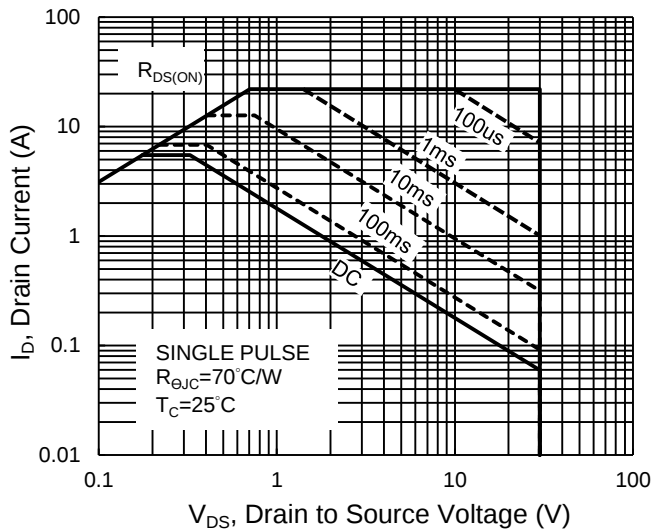
Capacitance vs. Drain-Source Voltage



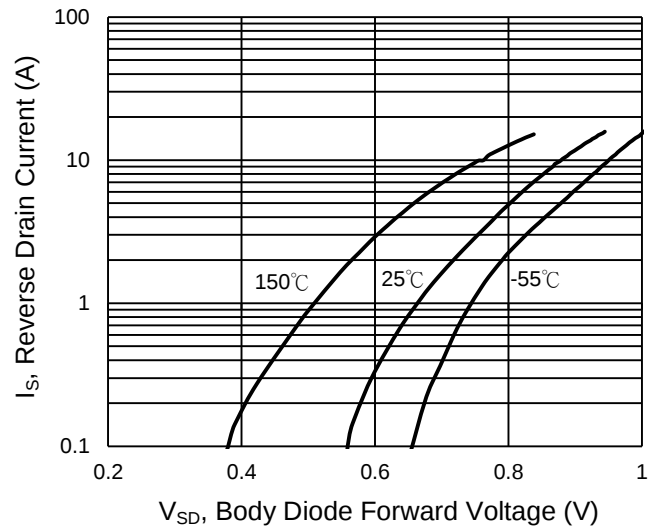
BV_{DSS} vs. Junction Temperature



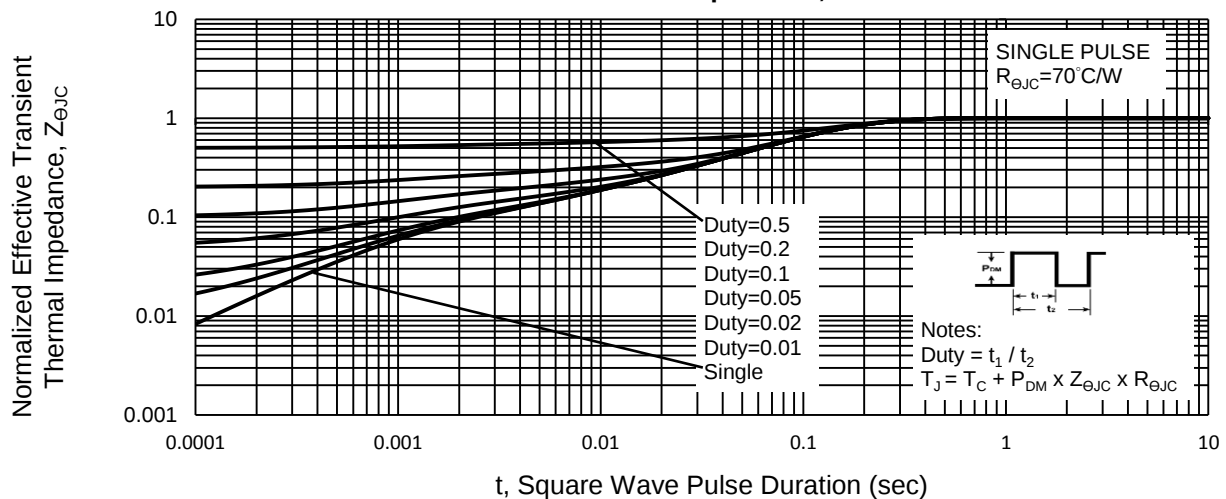
Maximum Safe Operating Area, Junction-to-Case



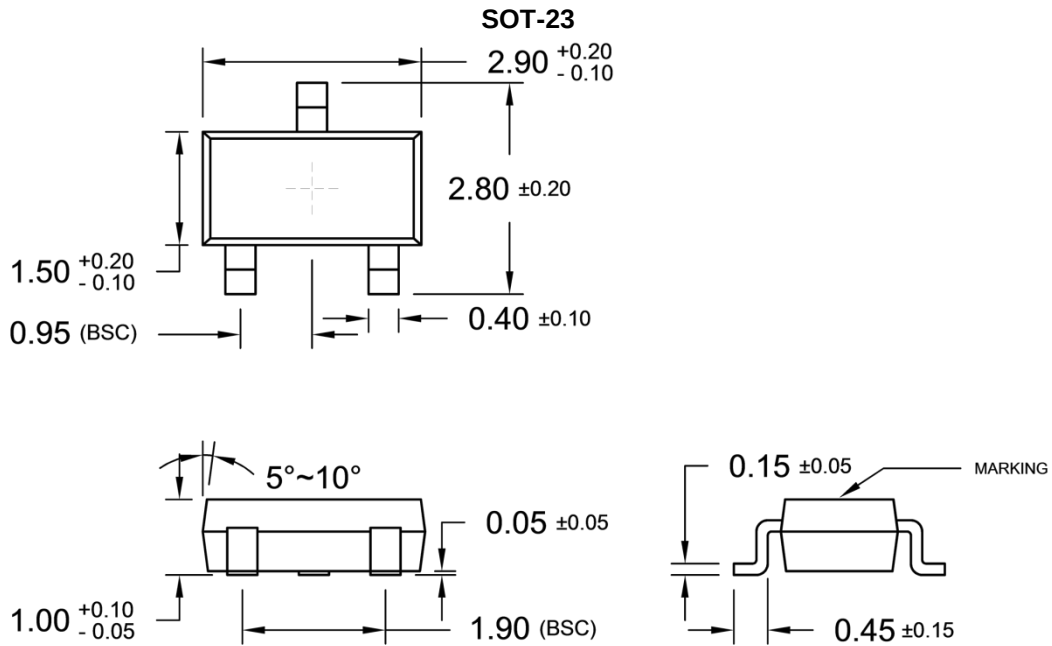
Source-Drain Diode Forward Current vs. Voltage



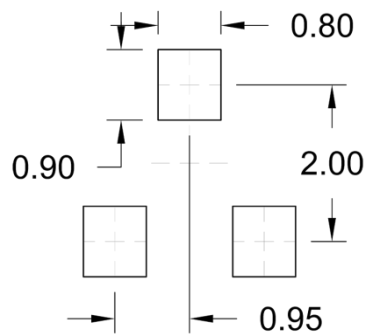
Normalized Thermal Transient Impedance, Junction-to-Case



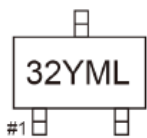
PACKAGE OUTLINE DIMENSIONS (Unit: Millimeters)



SUGGESTED PAD LAYOUT (Unit: Millimeters)



MARKING DIAGRAM



32 = Device Code

Y = Year Code

M = Month Code

O =Jan **P** =Feb **Q** =Mar **R** =Apr

S =May **T** =Jun **U** =Jul **V** =Aug

W =Sep **X** =Oct **Y** =Nov **Z** =Dec

L = Lot Code

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