

N-Channel ENHANCEMENT MODE POWER MOSFET

(Pb) Lead(Pb)-Free

FEATURES:

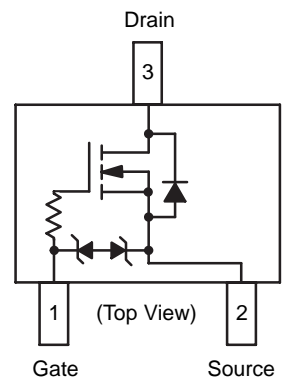
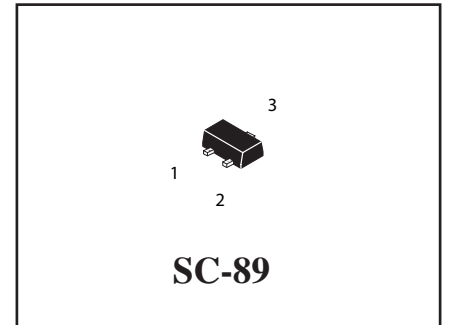
- * Power Mosfet : 1.8V Rated
- * Gate-Source ESD Protected: 2000 V
- * High-Side Switching
- * Low On-Resistance: 0.7Ω
- * Low Threshold: 0.8 V (typ)
- * Fast Switching Speed: 10 ns

BENEFITS:

- * Ease in Driving Switches
- * Low Offset (Error) Voltage
- * Low-Voltage Operation
- * High-Speed Circuits
- * Low Battery Voltage Operation

APPLICATIONS:

- * Drivers: Relays, Solenoids, Lamps, Hammers, Displays, Memories
- * Battery Operated Systems
- * Power Supply Converter Circuits
- * Load/Power Switching Cell Phones, Pagers



ABSOLUTE MAXIMUM RATINGS ($T_A = 25^\circ\text{C}$ UNLESS OTHERWISE NOTED)

Parameter		Symbol	5 secs	Steady State	Unit
Drain-Source Voltage		V_{DS}	20		V
Gate-Source Voltage		V_{GS}	± 6		
Continuous Drain Current ($T_J = 150^\circ\text{C}$) ^b	$T_A = 25^\circ\text{C}$	I_D	600	500	mA
	$T_A = 85^\circ\text{C}$		400	350	
Pulsed Drain Current ^a		I_{DM}	1000		
Continuous Source Current (diode conduction) ^b		I_S	275	250	mW
Maximum Power Dissipation ^b for SC-75	$T_A = 25^\circ\text{C}$	P_D	175	150	
	$T_A = 85^\circ\text{C}$		90	80	
Maximum Power Dissipation ^b for SC-89	$T_A = 25^\circ\text{C}$		275	250	
	$T_A = 85^\circ\text{C}$		160	140	
Operating Junction and Storage Temperature Range		T_J, T_{stg}	-55 to 150		$^\circ\text{C}$
Gate-Source ESD Rating (HBM, Method 3015)		ESD	2000		V

Notes

- d. Pulse width limited by maximum junction temperature.
- e. Surface Mounted on FR4 Board.

Device Marking

WTX1012 = A

Electrical Characteristics (T_A=25°C Unless otherwise noted)

Parameter	Symbol	Test Condition	Min	Typ	Max	Unit
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Static

Gate Threshold Voltage	V _{GS(th)}	V _{DS} = V _{GS} , I _D = 250 μA	0.45		0.9	V
Gate-Body Leakage	I _{GSS}	V _{DS} = 0 V, V _{GS} = ±4.5 V		±0.5	±1.0	μA
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} = 20 V, V _{GS} = 0 V		0.3	100	nA
		V _{DS} = 20 V, V _{GS} = 0 V, T _J = 85°C			5	μA
On-State Drain Current ¹	I _{D(on)}	V _{DS} = 5 V, V _{GS} = 4.5 V	700			mA
Drain-Source On-State Resistance ^a	r _{DS(on)}	V _{GS} = 4.5 V, I _D = 600 mA		0.41	0.70	Ω
		V _{GS} = 2.5 V, I _D = 500 mA		0.53	0.85	
		V _{GS} = 1.8 V, I _D = 350 mA		0.70	1.25	
Forward Transconductance ^a	g _{fs}	V _{DS} = 10 V, I _D = 400 mA		1.0		S
Diode Forward Voltage ^a	V _{SD}	I _S = 150 mA, V _{GS} = 0 V		0.8	1.2	V

Dynamic

Total Gate Charge	Q _g	V _{DS} = 10 V, V _{GS} = 4.5 V, I _D = 250 mA		750		pC
Gate-Source Charge	Q _{gs}			75		
Gate-Drain Charge	Q _{gd}			225		
Turn-On Delay Time	t _{d(on)}	V _{DD} = 10 V, R _L = 47 Ω I _D ≅ 200 mA, V _{GEN} = 4.5 V, R _G = 10 Ω		5		ns
Rise Time	t _r			5		
Turn-Off Delay Time	t _{d(off)}			25		
Fall Time	t _f			11		

Notes

1. Pulse test; pulse width ≤ 300 μs, duty cycle ≤ 2%.
2. Guaranteed by design, not subject to production testing.

Stresses beyond those listed under "Absolute Maximum Ratings" may cause permanent damage to the device. These are stress ratings only, and functional operation of the device at these or any other conditions beyond those indicated in the operational sections of the specifications is not implied. Exposure to absolute maximum rating conditions for extended periods may affect device reliability.

Characteristics Curve

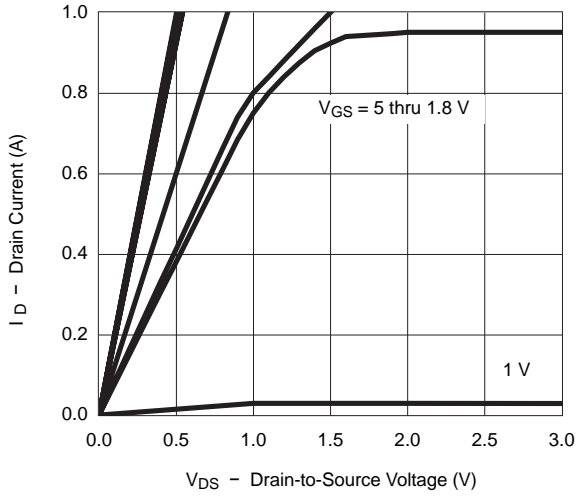


Fig.1 Output Characteristics

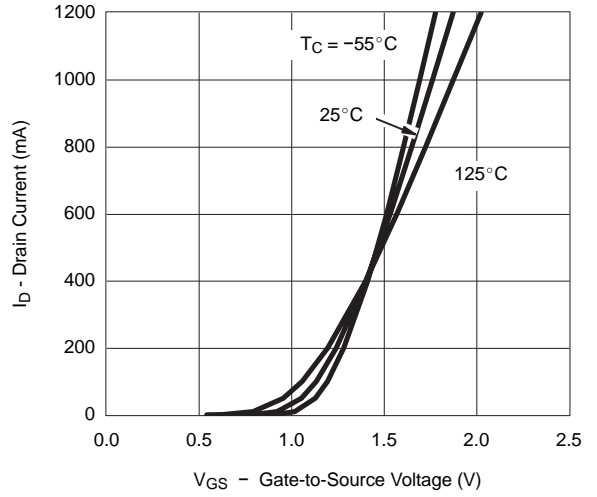


Fig.2 Transfer Characteristics

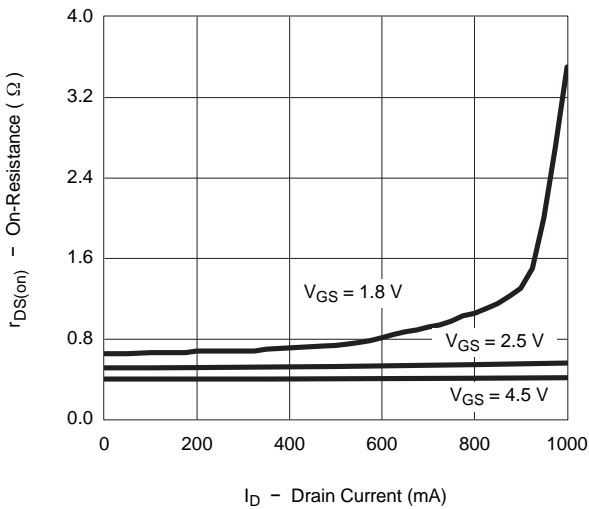


Fig.3 On-Resistance vs. Drain Current

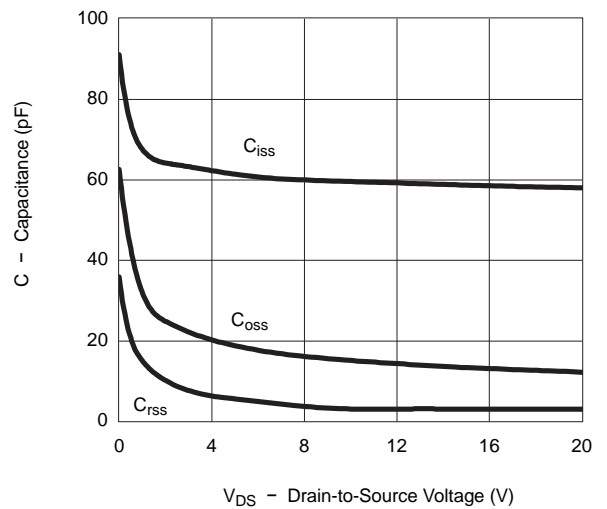


Fig.4 Capacitance

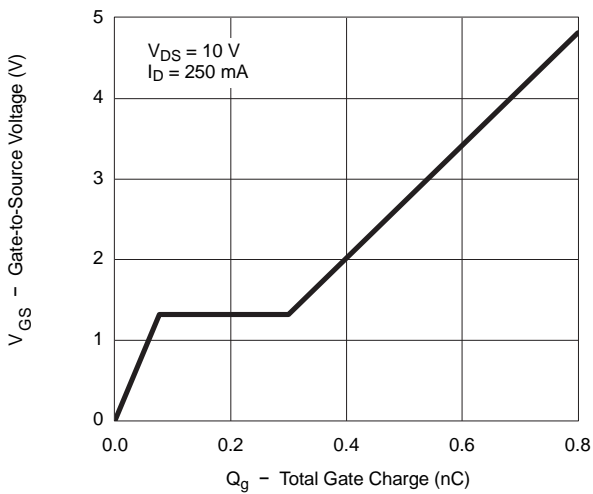


Fig.5 Gate Charge

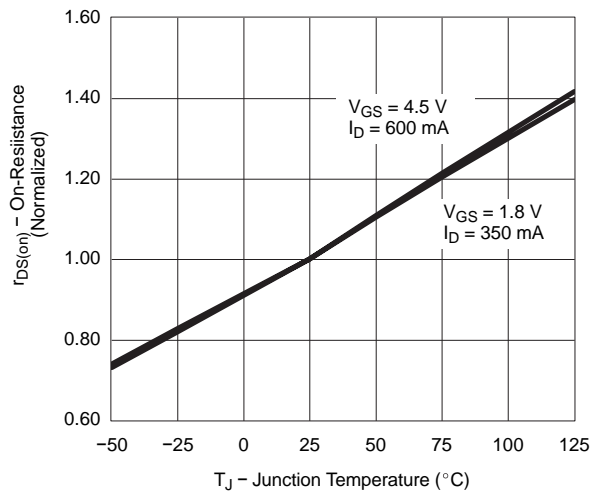


Fig.6 On-Resistance vs. Junction Temperature

Characteristics Curve

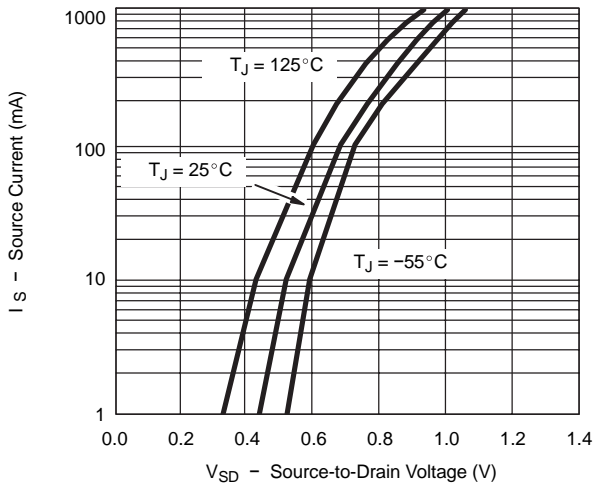


Fig.7 Source-Drain Diode Forward Voltage

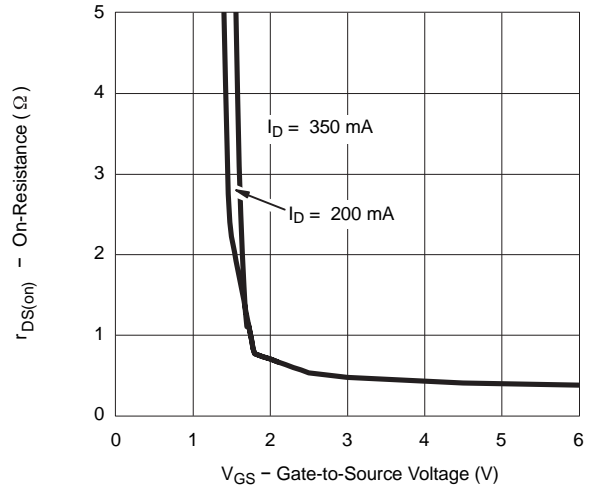


Fig.8 On-Resistance vs. Gate-to-Source Voltage

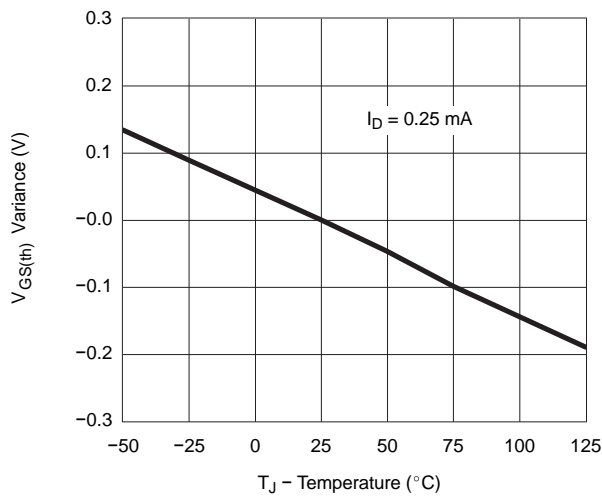


Fig.9 Threshold Voltage Variance vs. Temperature

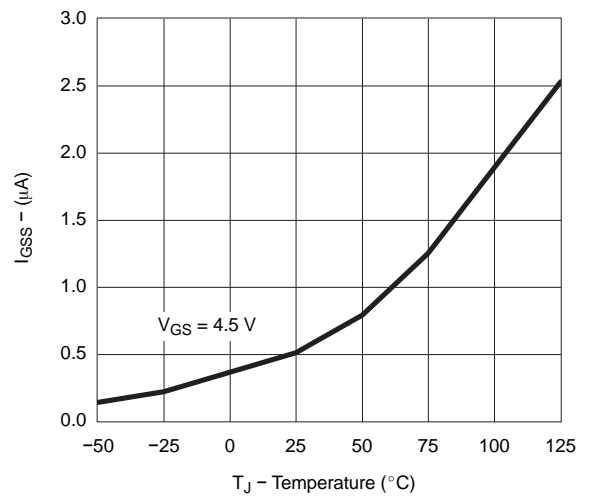


Fig.10 I_GSS vs. Temperature

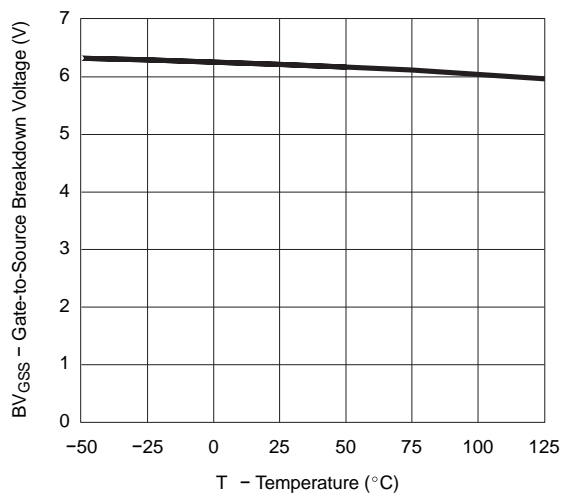


Fig.11 BV_GSS vs. Temperature

Characteristic Curves

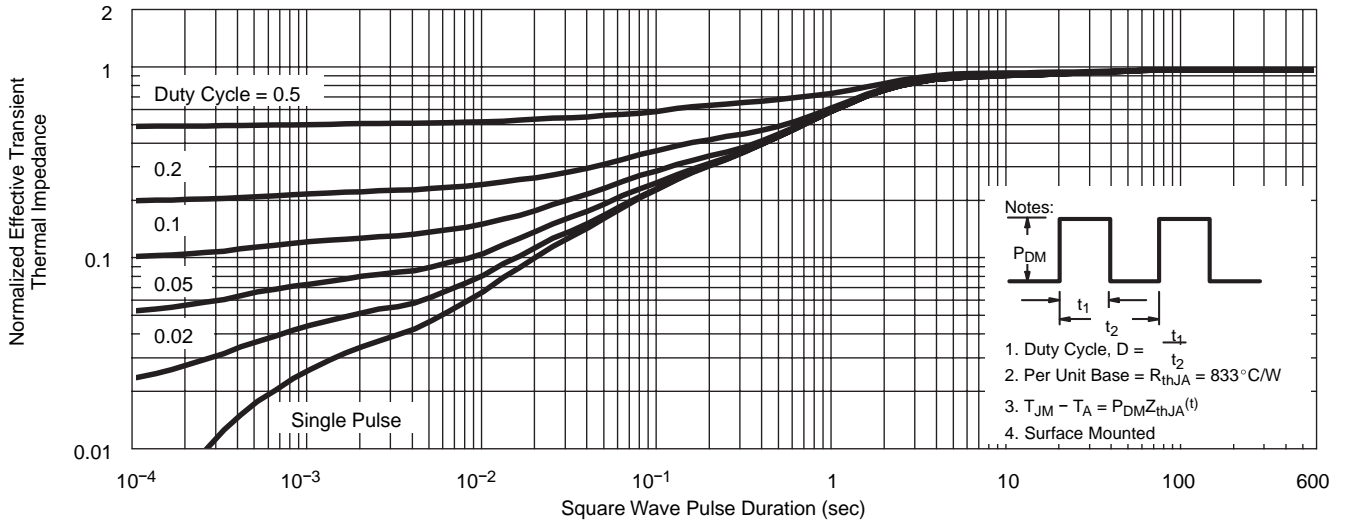


Fig.12 Normalized Thermal Transient Impedance, Junction-to-Ambient (SC-75A)

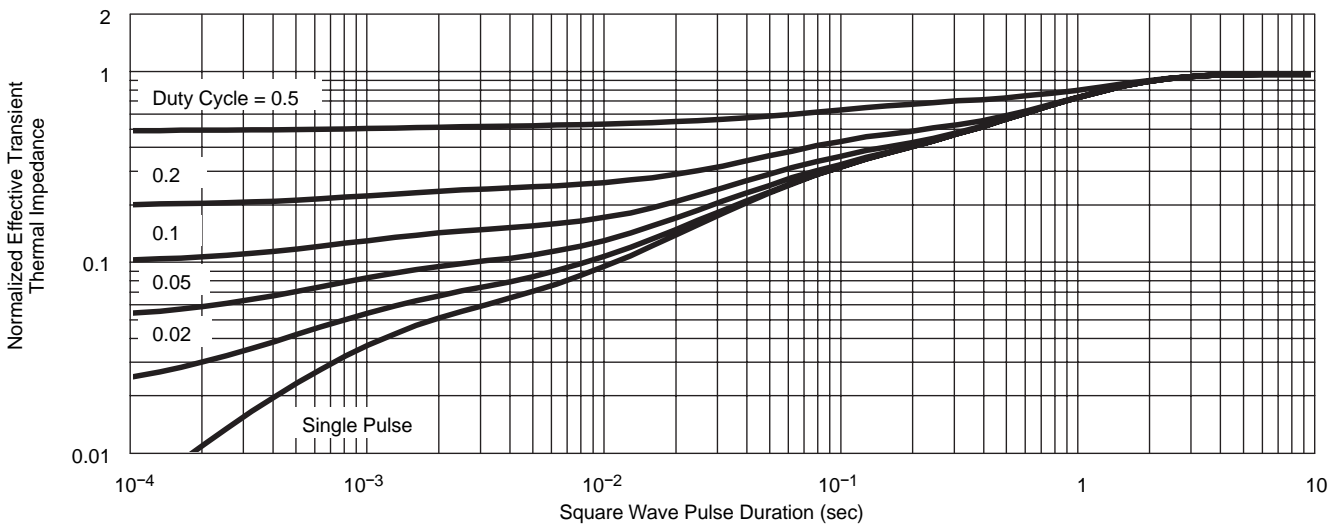


Fig.13 Normalized Thermal Transient Impedance, Junction-to-Foot

SC-89 Outline Demensions

Unit:mm

