

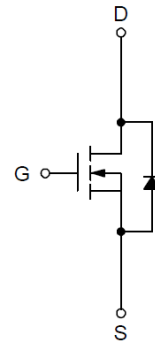
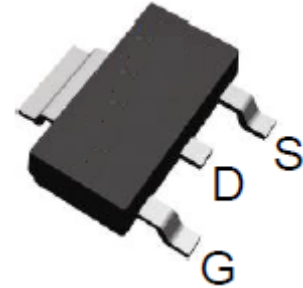
700V N-Channel Power MOSFET

Features

- High Voltage: $BV_{DSS}=700V(\text{Min.})$
- Reliable and Rugged
- Avalanche Rated
- Lead Free and Green Devices Available
- 100% UIS + Rg Tested

Application

- AC/DC Power Conversion in Switched Mode Power Supplies (SMPS)
- Uninterruptible Power Supply (UPS)
- Adapter



Ordering Information

Type NO	Marking	Package Code
WSM1170V	M1170V	TO-223-2

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

Characteristic	Symbol	Rating	Unit	
Drain-source voltage	V_{DSS}	700	V	
Gate-source voltage	V_{GSS}	± 30	V	
Drain current (DC)	I_D	($T_C=25^\circ\text{C}$)	5.5 ^a	A
		($T_C=100^\circ\text{C}$)	3.5 ^a	A
Drain current (Pulsed) ^b	I_{DP}	13.5 ^b	A	
Power dissipation	P_D	5.6	W	
MOSFET dv/dt ruggedness	dv/dt	50 ^c	V/ns	
Single pulsed avalanche energy	E_{AS}	41.6 ^d	mJ	
Avalanche current	I_{AR}	0.8 ^e	A	
Repetitive avalanche energy	E_{AR}	0.1 ^e	mJ	
Junction temperature	T_J	150	°C	
Storage temperature range	T_{stg}	-55~150		

Note a: TO-220 equivalent limited by maximum junction temperature.

Note b: Bound wire current limit.

Note c: $V_{DS}=560V$, $I_D=5.5A$

Note d: $I_D=0.8A$, $V_{DD}=50V$, $T_J=25^\circ\text{C}$

Note e: Repetitive Rating : Pulse width limited by maximum junction temperature.

Characteristic	Symbol	Rating	Unit	
Thermal resistance	Junction-case	$R_{th(J-L)}$	22	°C/W
	Junction-ambient	$R_{th(J-A)}$	70	

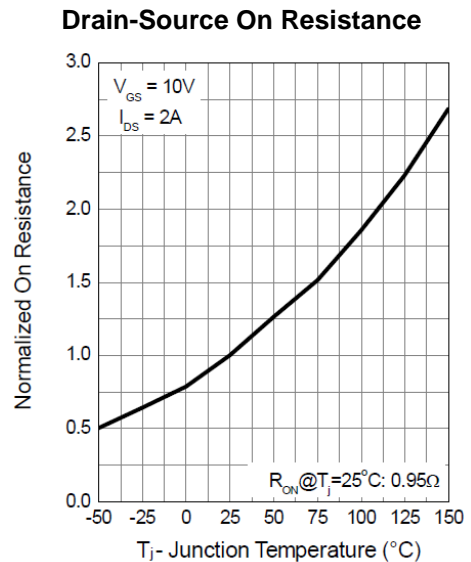
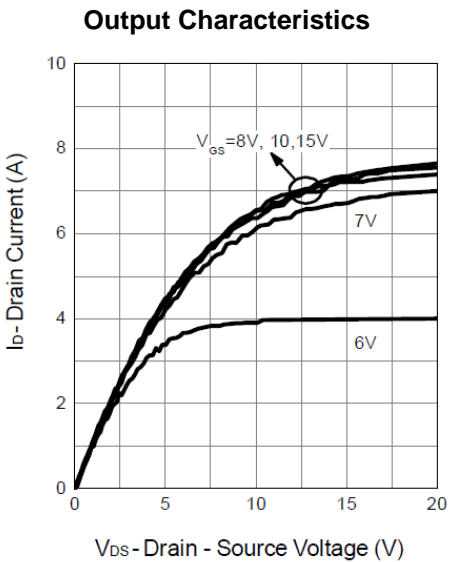
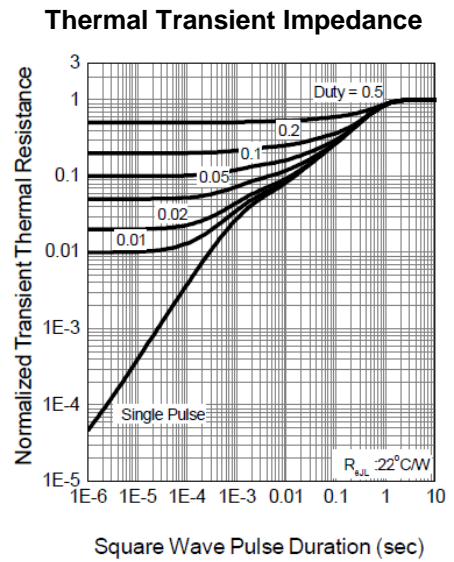
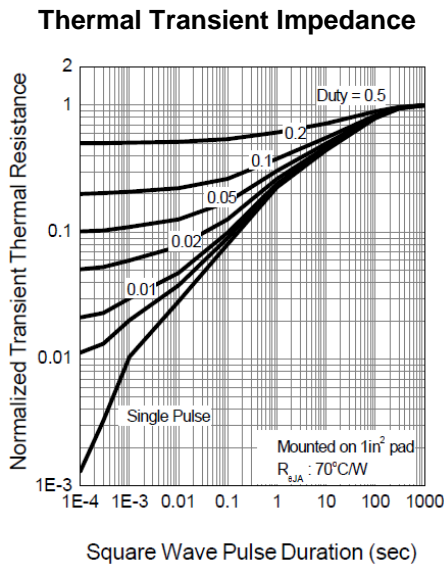
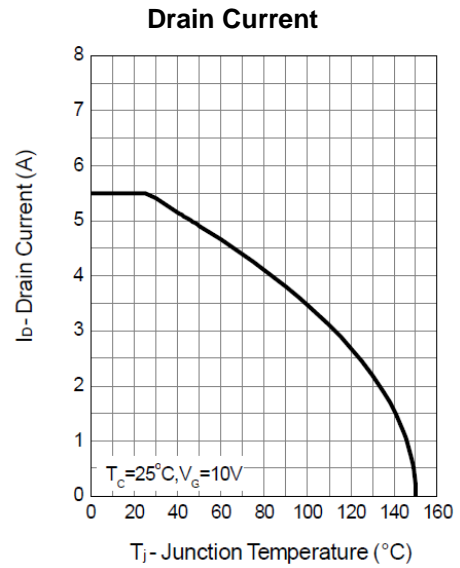
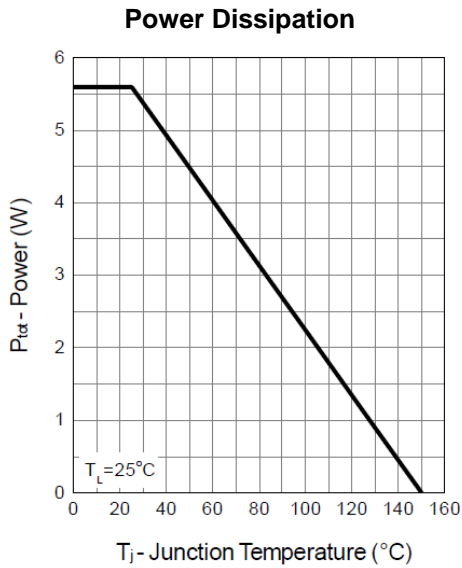
Electrical Characteristics (T_A=25°C unless otherwise noted)

Characteristic	Symbol	Test Condition	Min.	Typ.	Max.	Unit
Drain-source breakdown voltage	BV _{DSS}	I _D =250μA, V _{GS} =0	700	-	-	V
Gate threshold voltage	V _{GS(th)}	I _D =250μA, V _{DS} =V _{GS}	2.5	3.5	4.5	V
Drain-source cut-off current	I _{DSS}	V _{DS} =560V, V _{GS} =0V	-	-	1	μA
Gate leakage current	I _{GSS}	V _{DS} =0V, V _{GS} =±30V	-	-	±100	nA
Drain-source on-resistance	R _{DS(ON)}	V _{GS} =10V, I _{DS} =2A	-	0.95	1.1	Ω
Input capacitance	C _{iss}	V _{GS} =0V, V _{DS} =25V, f=1MHz	-	330	430	pF
Output capacitance	C _{oss}		-	160	-	
Reverse transfer capacitance	C _{rss}		-	5	-	
Turn-on delay time	t _{d(on)}	V _{DD} =400V, V _{GEN} =10V, I _{DS} =5.5A, R _G =6Ω	-	10	-	ns
Rise time	t _r		-	4.5	-	
Turn-off delay time	t _{d(off)}		-	14.5	-	
Fall time	t _f		-	2.5	-	
Total gate charge	Q _g	V _{DS} =560V, V _{GS} =10V I _{DS} =2A	-	14.3	18.6	nC
Gate-source charge	Q _{gs}		-	2.9	-	
Gate-drain charge	Q _{gd}		-	7	-	
Forward voltage	V _{SD}	V _{GS} =0V, I _S =5.5A	-	0.95	1.3	V
Reverse recovery time	t _{rr}	I _S =5.5A, V _R =420V dI _{SD} /dt=100A/μs	-	176	-	ns
Reverse recovery charge	Q _{rr}		-	1.37	-	μC
Peak Reverse Recovery Current	I _{rm}		-	13.9	-	A

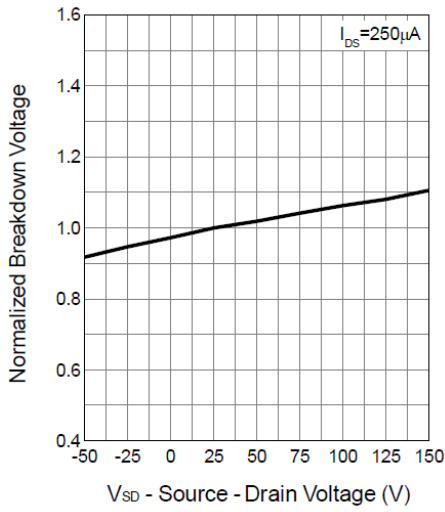
Note f: Pulse test ; pulse width ≤ 300μs, duty cycle ≤ 2%.

Note g: Guaranteed by design, not subject to production testing.

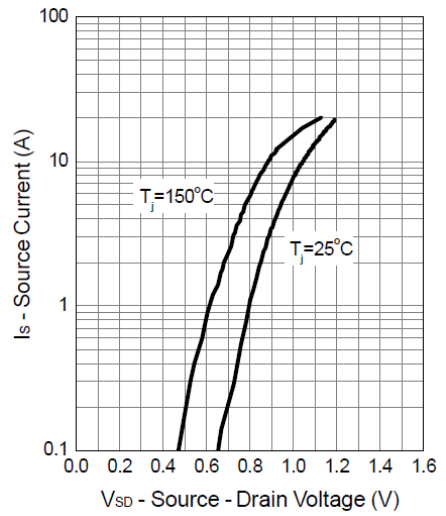
Typical Operating Characteristics



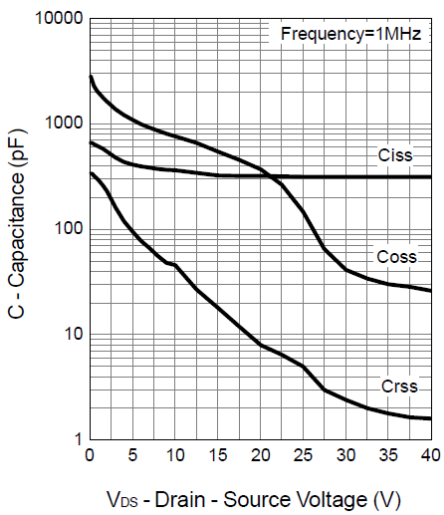
BVDSS vs Junction Temperature



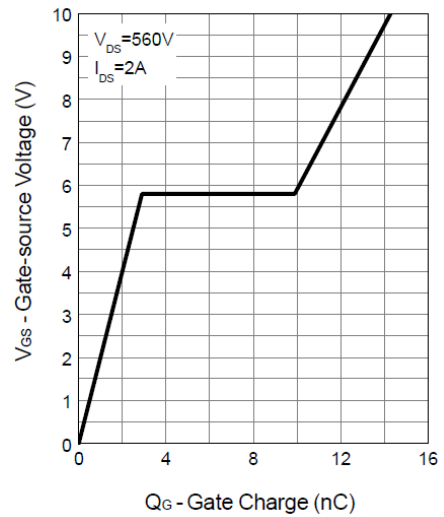
Source-Drain Diode Forward



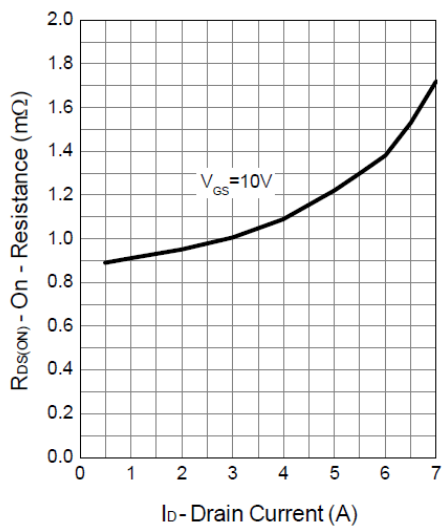
Capacitance



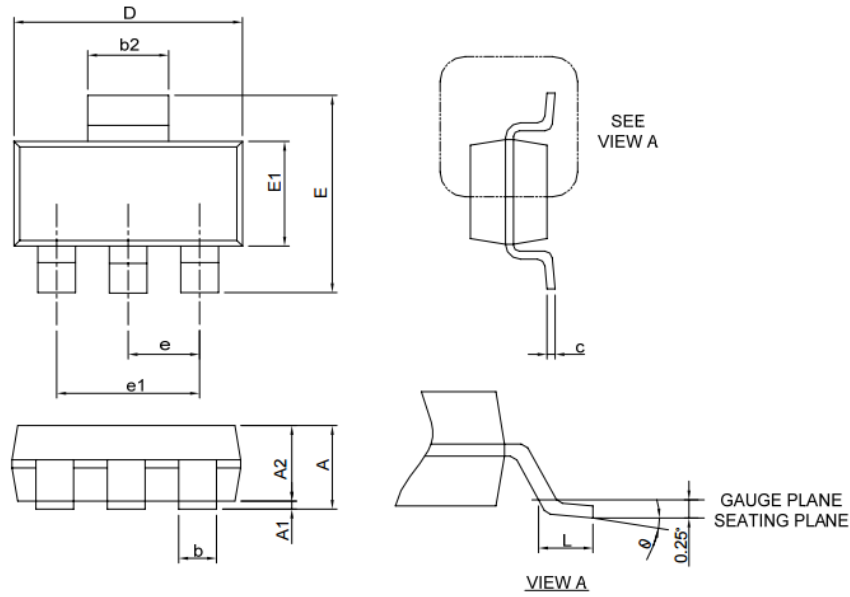
Gate Charge



Drain-Source On Resistance

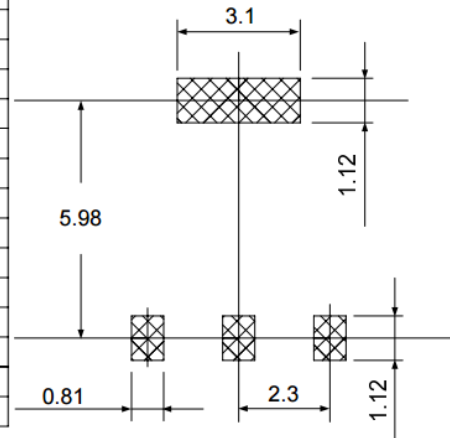


Outline Dimension



Symbol	SOT-223			
	MILLIMETERS		INCHES	
	MIN.	MAX.	MIN.	MAX.
A	-	1.80	-	0.071
A1	0.02	0.10	0.001	0.004
A2	1.50	1.70	0.059	0.067
b	0.66	0.84	0.026	0.033
b2	2.90	3.10	0.114	0.122
c	0.23	0.33	0.009	0.013
D	6.30	6.70	0.248	0.264
E	6.70	7.30	0.264	0.287
E1	3.30	3.70	0.130	0.146
e	2.30 BSC		0.091 BSC	
e1	4.60 BSC		0.181 BSC	
L	0.75	-	0.030	-
θ	0°	10°	0°	10°

RECOMMENDED LAND PATTERN



UNIT: mm

- Note : 1. Follow from JEDEC TO-261 AA.
 2. Dimension D and E1 are determined at the outermost extremes of the plastic exclusive of mold flash, tie bar burrs, gate burrs, and interlead flash, but including any mismatch between the top and bottom of the plastic body.



First Line	WTC	Company Name	
Second Line	M1170V	Product Code	
Third Line	HE0MVI	1st (Year Code)	A-2010 B-2011 C-2012 ...
		2nd(Month Code)	A-Jan B-Feb C-Mar D-Apr E-May F-Jun G-Jul H-Aug I-Sep J-Oct K-Nov L-Dec
		3rd (Lot Code)	0-1 , A-9
		4th(Product Code)	M-MOS , T-Transistor
		5th (Package Code)	B-TO-263 , X-TO-220 , V-SOT223-2
		6th (Spec Code)	(Reserve)