MESS138W/MESS138W-G

N - Channel 50-V (D-S) MOSFET

GENERAL DESCRIPTION

The MESS138W is the N-Channel logic enhancement mode power field effect transistors are produced using high cell density, DMOS trench technology. This high density process is especially tailored to minimize on-state resistance.

FEATURES

- $R_{DS(ON)} \leqq 3\Omega @ V_{GS}=10V$
- $R_{DS(ON)} \leqq 3.5\Omega @ VGS=5V$
- $R_{DS(ON)} \leqq 7\Omega @ VGS=2.75V$
- Super high density cell design for extremely low $R_{DS(ON)}$
- Exceptional on-resistance and maximum DC current capability

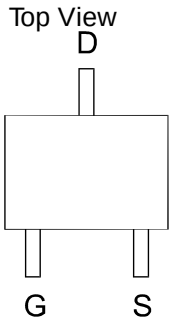
APPLICATIONS

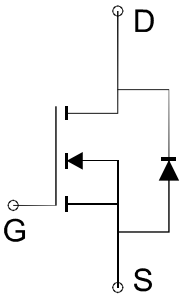
- Power Management in Note book
- DC/DC Converter
- Load Switch
- LCD Display inverter

PIN CONFIGURATION

(SOT-323)

Top View





Ordering Information: MESS138W (Pb-free)

MESS138W-G (Green product-Halogen free)

Absolute Maximum Ratings (T_A=25℃ Unless Otherwise Noted)

Parameter		Symbol	Maximum Ratings	Unit
Drain-Source Voltage		V_{DS}	50	V
Gate-Source Voltage		V_{GS}	±20	V
Continuous Drain	T_A=25℃	I_D	0.5	A
Pulsed Drain Current		I_{DM}	1.8	A
Maximum Power Dissipation	T_A=25℃	P_D	1	W
Operating Junction Temperature		T_J	-55 to 150	℃
Thermal Resistance-Junction to Ambient*		$R_{\theta JA}$	130	℃/W

* The device mounted on 1in^2 FR4 board with 2 oz copper

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Electrical Characteristics (T_A=25℃ Unless Otherwise Specified)

Symbol	Parameter	Limit	Min	Typ	Max	Unit
STATIC						
BV_{DSS}	Drain-Source Breakdown Voltage	V_{GS}=0V, I_D=250μA	50			V
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS}=V_{GS}, I_D=1mA	0.5		1.5	V
I_{GSS}	Gate-Body Leakage	V_{DS}=0V, V_{GS}=±20V			±100	nA
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS}=50V, V_{GS}=0V			0.5	μA
$R_{DS(ON)}$	Drain-Source On-Resistance*	V_{GS}=10V, I_D=200mA		1.3	3	Ω
		V_{GS}=5V, I_D=200mA		1.4	3.5	
		V_{GS}=2.75V, I_D=200mA		1.6	7	
V_{SD}	Diode Forward Voltage *	I_S=0.44A, V_{GS}=0V		0.8	1.4	V
DYNAMIC						
Qg	Total Gate Charge	V_{DS}=25V, V_{GS}=10V, I_D=0.22A		7.0		nC
Qgs	Gate-Source Charge			1.8		
Qgd	Gate-Drain Charge			0.7		
Rg	Gate Resistance	V_{DS}=0V, V_{GS}=0V, f=1MHz		8.7		Ω
Ciss	Input Capacitance	V_{DS}=25V, V_{GS}=0V, f=1MHz		42		pF
Coss	Output Capacitance			15		
Crss	Reverse Transfer Capacitance			3		
$t_{d(on)}$	Turn-On Delay Time	V_{DD}=30V, R_L =103Ω I_D=0.29A, V_{GS}=10V, R_{GEN}=6Ω		4.63		ns
t_r	Turn-On Rise Time			6.8		
$t_{d(off)}$	Turn-Off Delay Time			18.9		
t_f	Turn-Off Fall Time			11.4		

Notes: a. Pulse test; pulse width ≦ 300us, duty cycle≦ 2%

b. Matsuki Electric/ Force mos reserves the right to improve product design, functions and reliability without notice.

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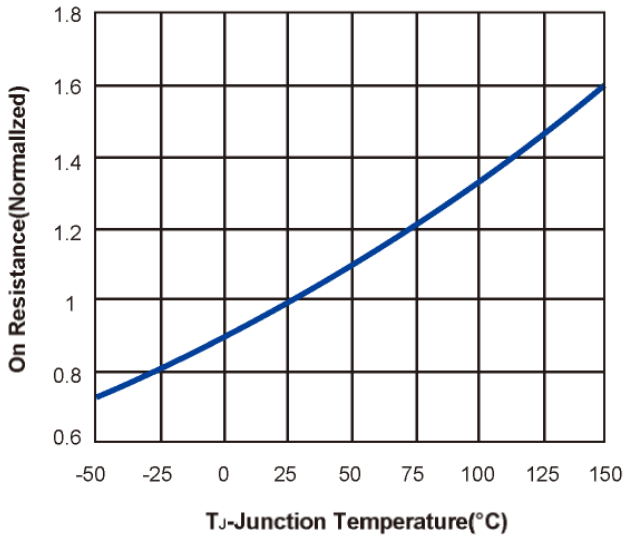
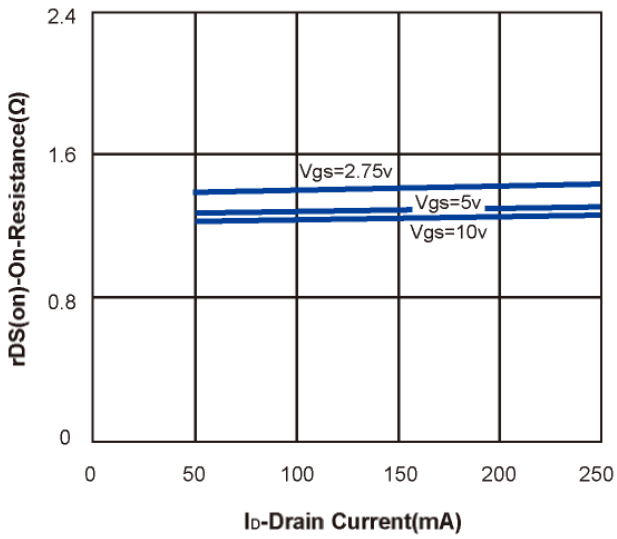
Typical Characteristics (T_J =25℃ Noted)

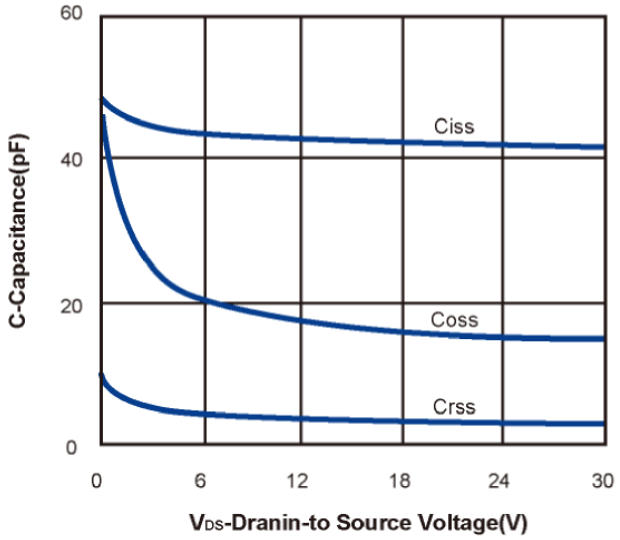
On Resistance vs. Junction Temperature



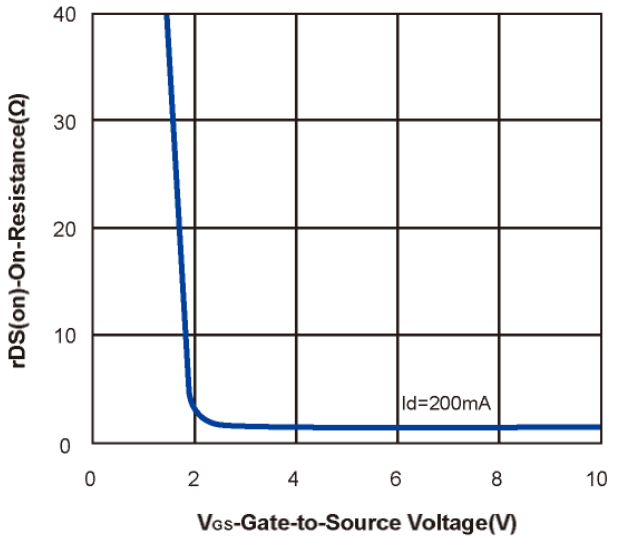
On Resistance vs. Drain Current



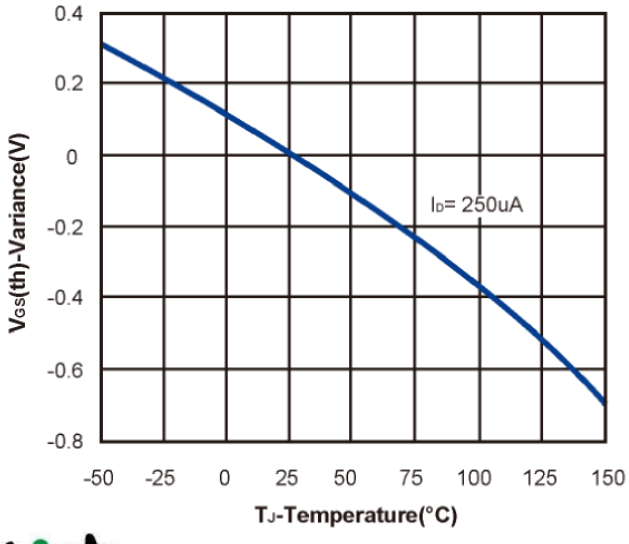
Capacitance



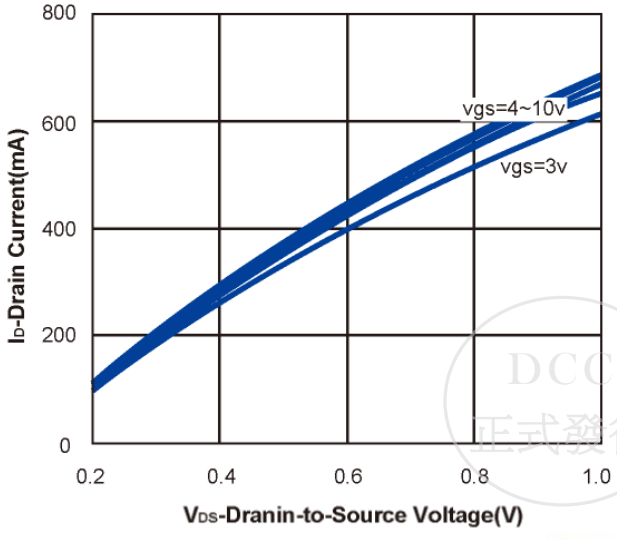
On Resistance vs. Gate-to-Source Voltage



Threshold Voltage



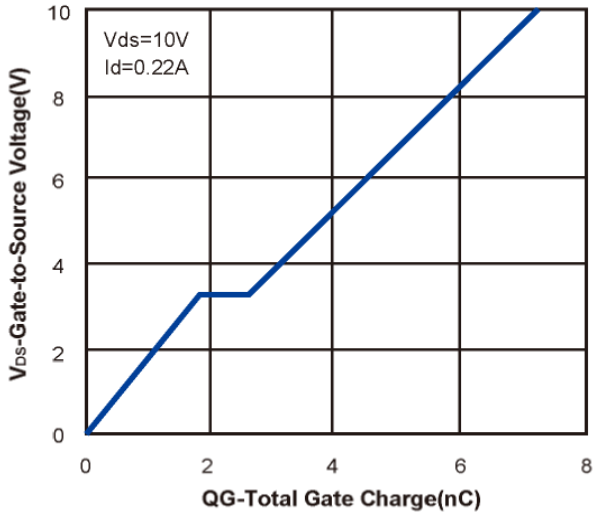
On-Region Characteristics



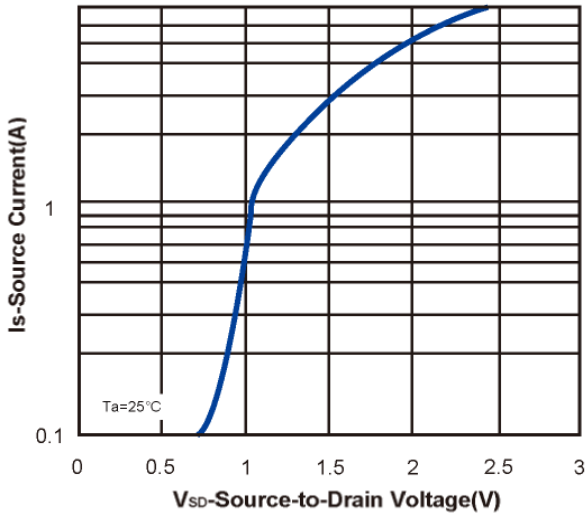
N - Channel 50-V (D-S) MOSFET

Typical Characteristics (T_J =25℃ Noted)

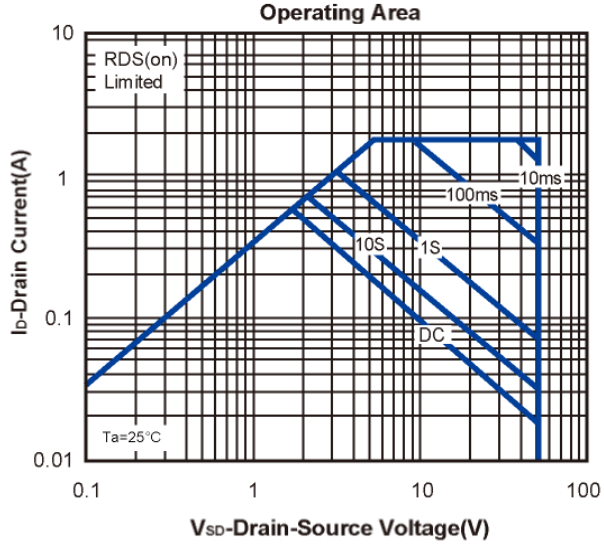
Gate Charge



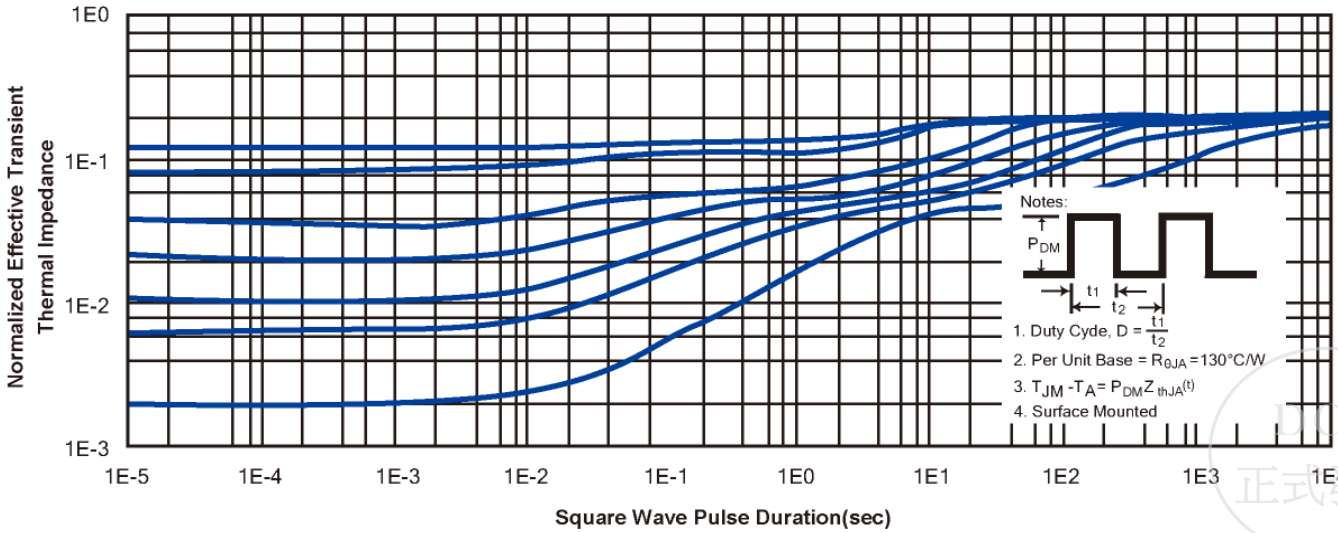
Body-diode characteristics



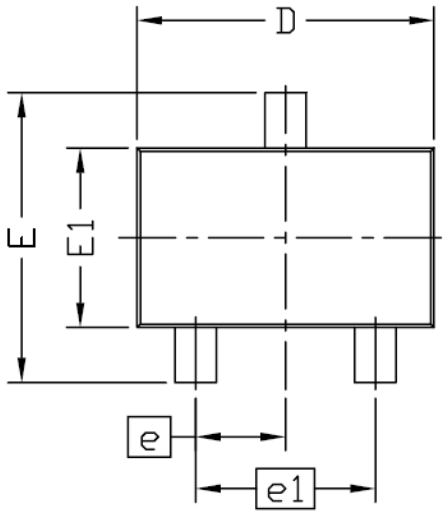
Maximum Forward Biased Safe Operating Area

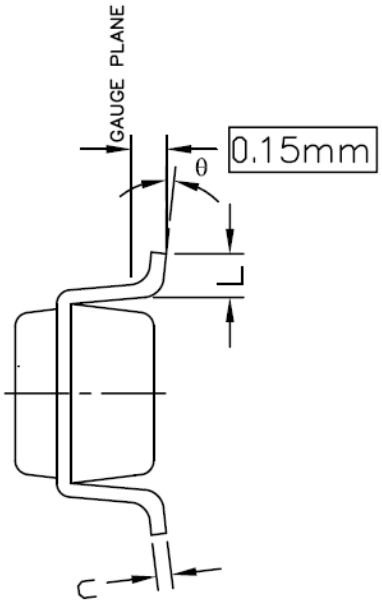


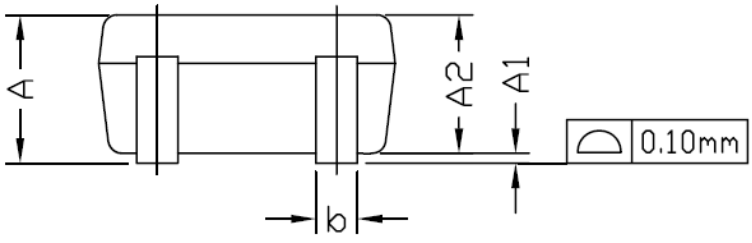
Normalized Thermal Transient Impedance, Junction-to-Ambient



SOT-323 Package







DIM	MILLIMETERS (mm)	
	MIN	MAX
A	-	1.10
A1	0.00	0.10
A2	0.7	1.00
b	0.15	0.30
c	0.08	0.22
D	1.85	2.15
E	1.80	2.40
e	0.65 BSC	
e1	1.30 BSC	
E1	1.1	1.4
L	0.26	0.46
θ	0°	8°