

V_{DSS}	-30V
$R_{DS(on)}(Max.)$	1.4Ω
I_D	±0.2A
P_D	0.15W

●Features

- 1) Low on-resistance.
- 2) Small package(EMT3)
- 3) 4V drive
- 4) Lead Free/RoHS Compliant.

●Application

Switching

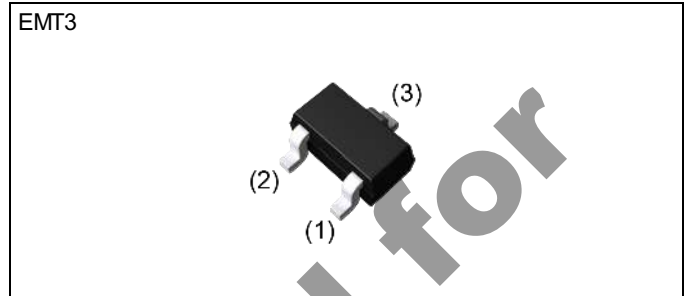
●Absolute maximum ratings ($T_a = 25^{\circ}C$)

Parameter	Symbol	Value	Unit
Drain - Source voltage	V_{DSS}	-30	V
Continuous drain current	I_D	±0.2	A
Pulsed drain current	$I_{D,pulse}^{*1}$	±0.4	A
Gate - Source voltage	V_{GSS}	±20	V
Power dissipation	P_D^{*2}	0.15	W
Junction temperature	T_j	150	°C
Range of storage temperature	T_{stg}	-55 to +150	°C

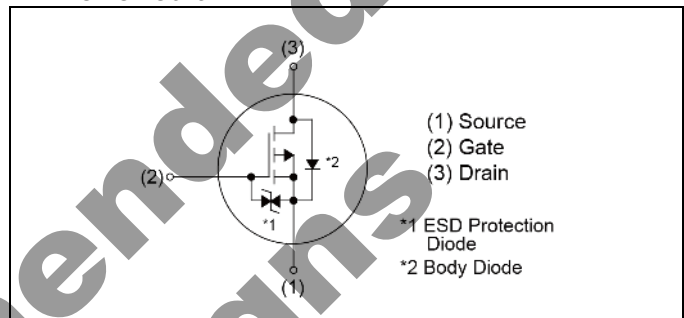
●Thermal resistance

Parameter	Symbol	Value	Unit
junction - ambient	$R_{th(ch-a)}^{*2}$	833	°C/W

●Outline



●Inner circuit



●Packaging specifications

Type	Packing	Embossed Tape
	Reel size (mm)	180
	Tape width (mm)	8
	Basic ordering unit (pcs)	3000
	Taping code	TL
	Marking	WP

●Electrical characteristics (T_a = 25°C)

Parameter	Symbol	Conditions	Values			Unit
			Min.	Typ.	Max.	
Drain - Source breakdown voltage	V _{(BR)DSS}	V _{GS} = 0V, I _D = -1mA	-30	-	-	V
Zero gate voltage drain current	I _{DSS}	V _{DS} = -30V, V _{GS} = 0V	-	-	-1	μA
Gate - Source leakage current	I _{GSS}	V _{GS} = ±20V, V _{DS} = 0V	-	-	±10	μA
Gate threshold voltage	V _{GS(th)}	V _{DS} = -10V, I _D = -1mA	-1.0	-	-2.5	V
Static drain - source on - state resistance	R _{DS(on)} ^{*3}	V _{GS} = -10V, I _D = -0.2A	-	0.9	1.4	Ω
		V _{GS} = -4.5V, I _D = -0.15A	-	1.4	2.1	
		V _{GS} = -4.0V, I _D = -0.15A	-	1.6	2.4	
Transconductance	g _{fs} ^{*3}	V _{DS} = -10V, I _D = -0.15A	0.2	-	-	S
Input capacitance	C _{iss}	V _{GS} = 0V	-	30	-	pF
Output capacitance	C _{oss}	V _{DS} = -10V	-	4	-	
Reverse transfer capacitance	C _{rss}	f = 1MHz	-	5	-	
Turn - on delay time	t _{d(on)} ^{*3}	V _{DD} = -15V, V _{GS} = -10V	-	8	-	ns
Rise time	t _r ^{*3}	I _D = 0.15A	-	5	-	
Turn - off delay time	t _{d(off)} ^{*3}	R _L = 100Ω	-	30	-	
Fall time	t _f ^{*3}	R _G = 10Ω	-	40	-	

●Body diode electrical characteristics (Source-Drain) (T_a = 25°C)

Parameter	Symbol	Conditions	Values			Unit
			Min.	Typ.	Max.	
Forward voltage	V _{SD} ^{*3}	V _{GS} = 0V, I _S = -0.1A	-	-	-1.2	V

*1 P_w ≤ 10μs, Duty cycle ≤ 1%

*2 Each terminal mounted on a recommended land

*3 Pulsed

● Electrical characteristic curves

Fig.1 Typical Capacitance vs. Drain - Source Voltage

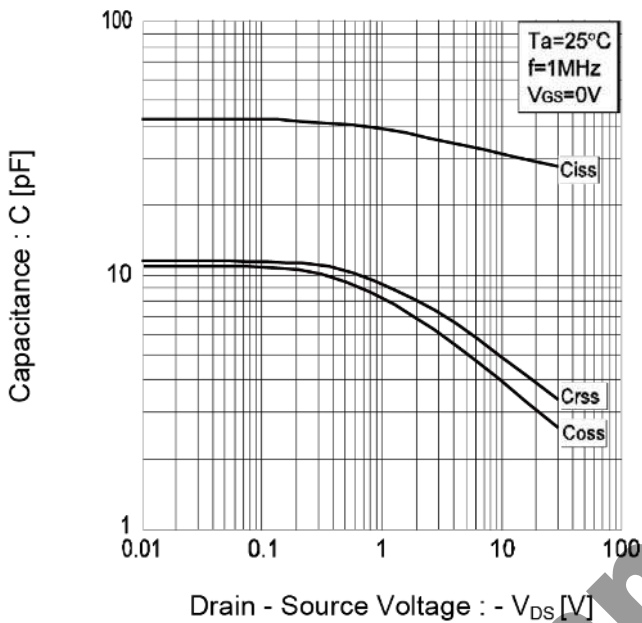


Fig.2 Switching Characteristics

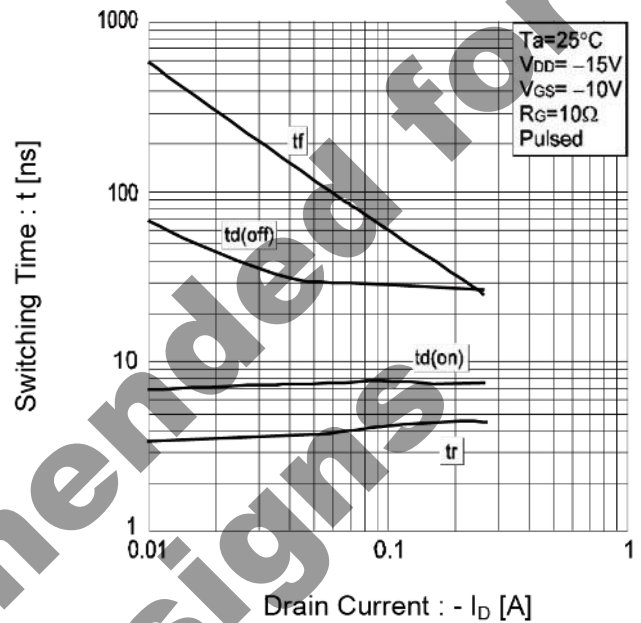


Fig.3 Dynamic Input Characteristics

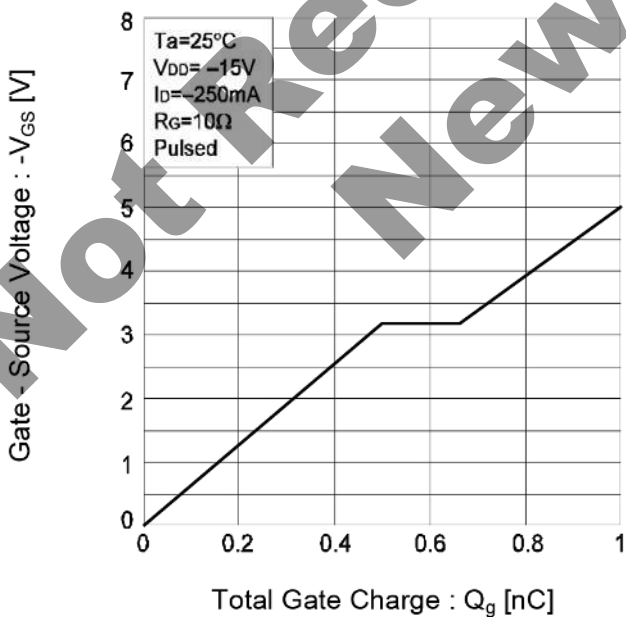
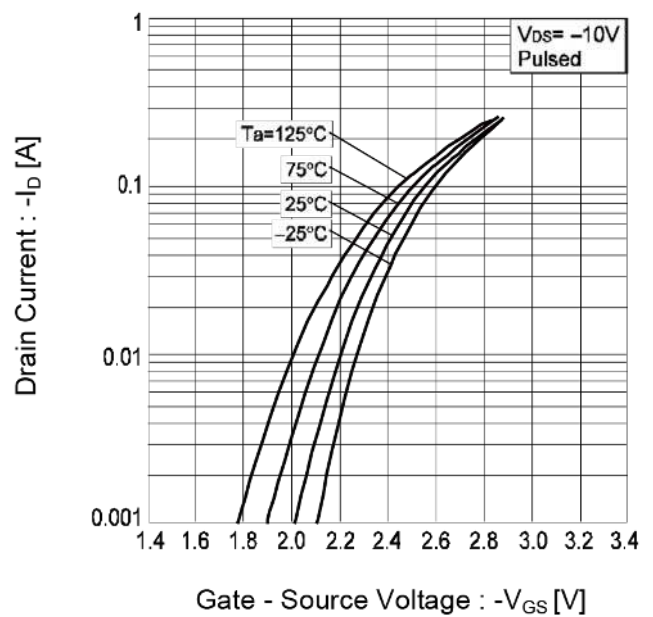


Fig.4 Typical Transfer Characteristics



● Electrical characteristic curves

Fig.5 Static Drain - Source On - State Resistance vs. Gate Source Voltage

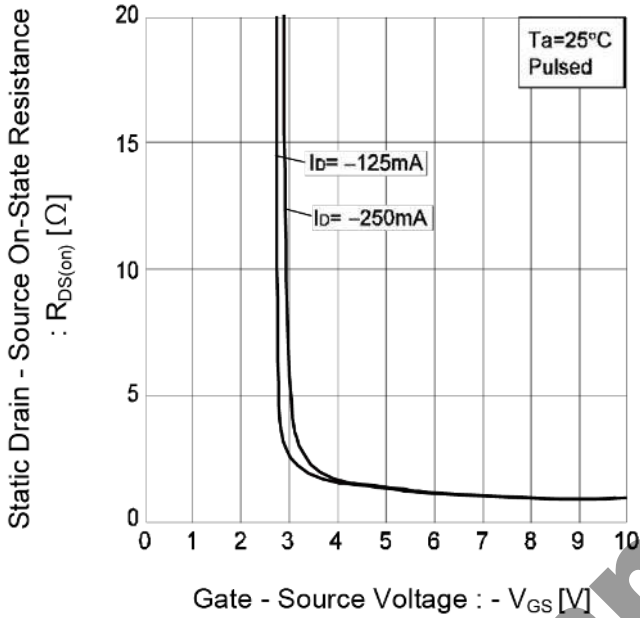


Fig.6 Reverse Drain Current vs. Source-Drain Voltage

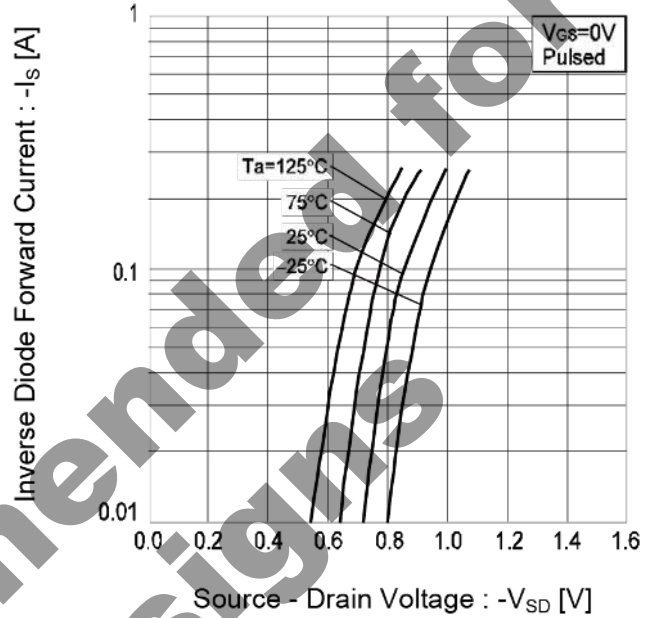


Fig.7 Static Drain - Source On - State Resistance vs. Drain Current (I)

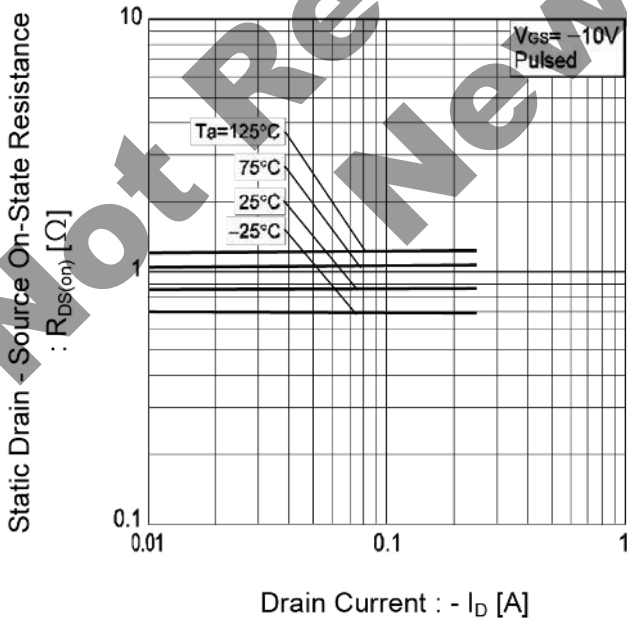
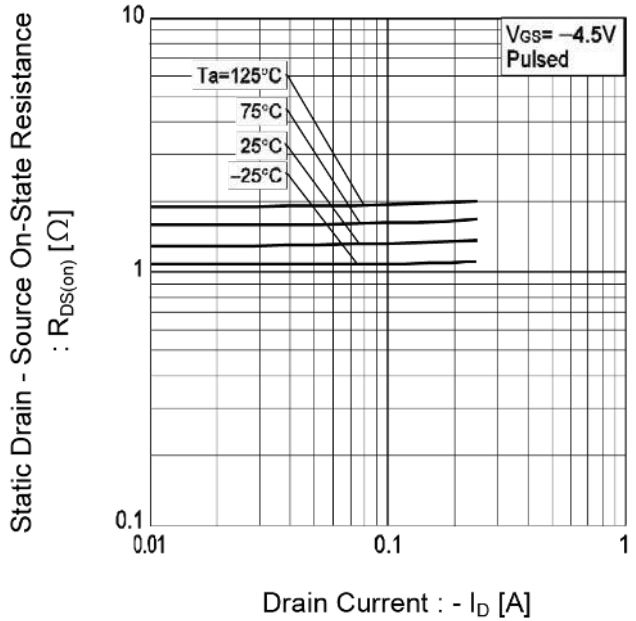


Fig.8 Static Drain - Source On - State Resistance vs. Drain Current (II)



● Electrical characteristic curves

Fig.9 Static Drain - Source On - State Resistance vs. Drain Current (III)

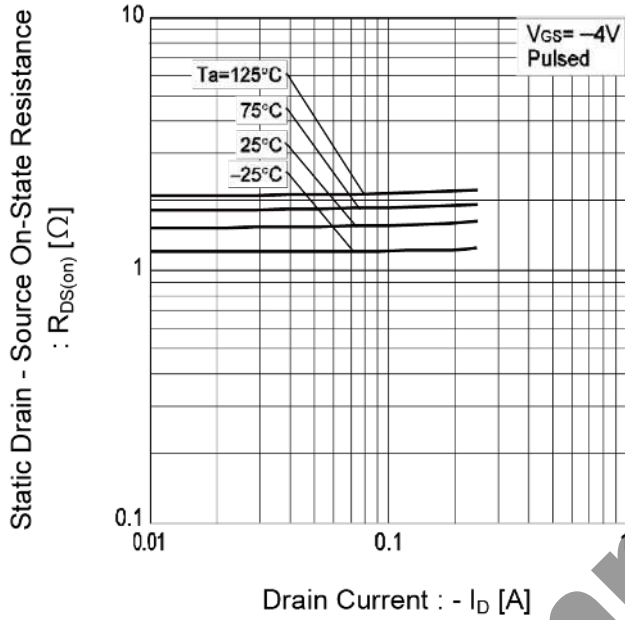
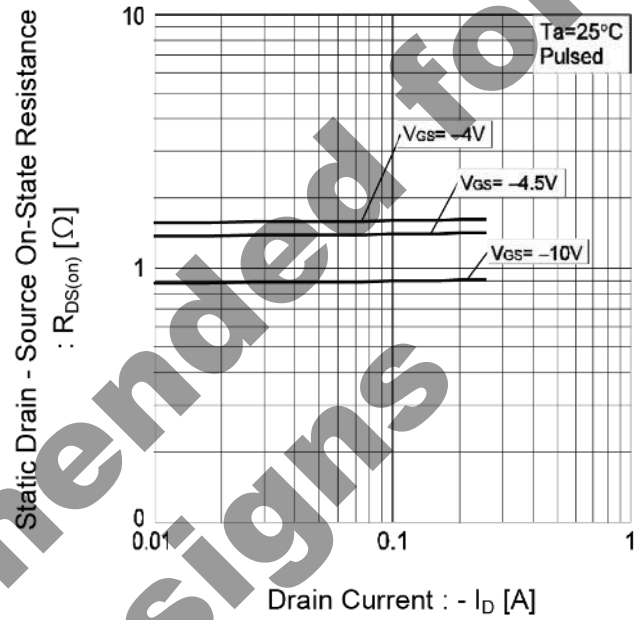


Fig.10 Static Drain - Source On - State Resistance vs. Drain Current (IV)



Not Recommended for New Designs

● Measurement circuits

Fig.1-1 Switching Time Measurement Circuit

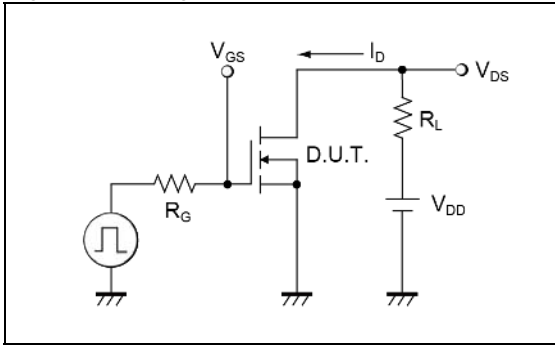
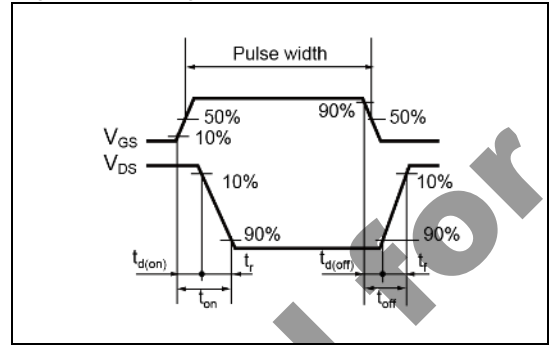


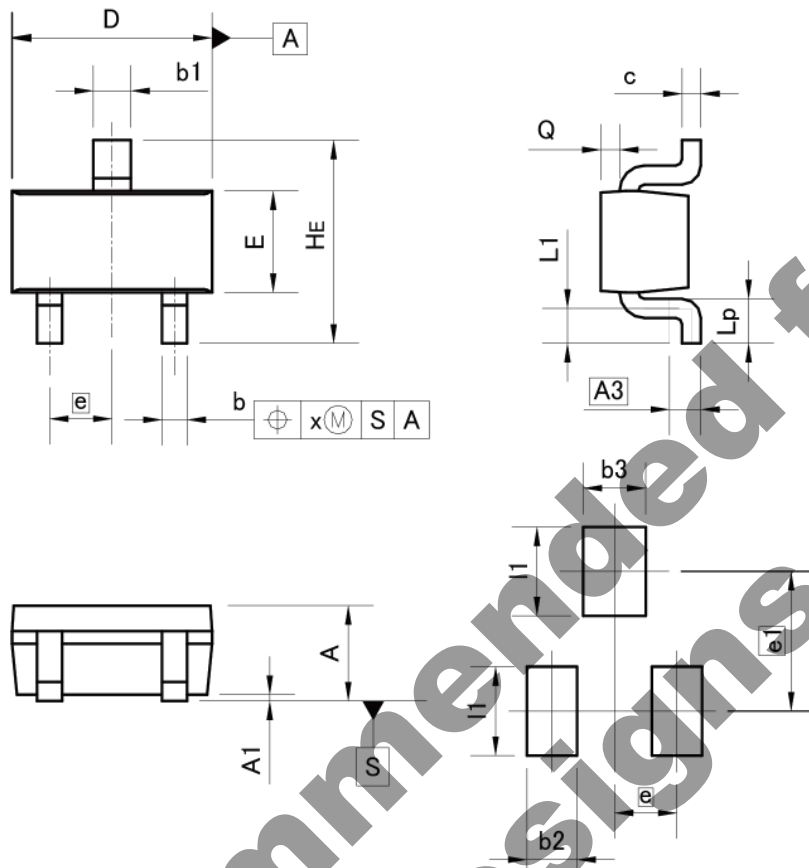
Fig.1-2 Switching Waveforms



Not Recommended for New Designs

●Dimensions

EMT3



Pattern of terminal position areas
[Not a recommended pattern of soldering pads]

DIM	MILIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	0.60	0.80	0.024	0.031
A1	0.00	0.10	0.000	0.004
A3	0.25		0.010	
b	0.15	0.30	0.006	0.012
b1	0.25	0.40	0.010	0.016
c	0.10	0.20	0.004	0.008
D	1.50	1.70	0.059	0.067
E	0.70	0.90	0.028	0.035
e	0.50		0.020	
HE	1.40	1.80	0.055	0.071
L1	0.10	-	0.004	-
Lp	0.15	-	0.006	-
Q	0.05	0.25	0.002	0.010
x	-	0.10	-	0.004

DIM	MILIMETERS		INCHES	
	MIN	MAX	MIN	MAX
b2	-	0.40	-	0.016
b3	-	0.50	-	0.020
e1	1.10		0.043	
l1	-	0.70	-	0.028

Dimension in mm/inches

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