

P-Channel Enhancement Mode Field Effect Transistor

General Description

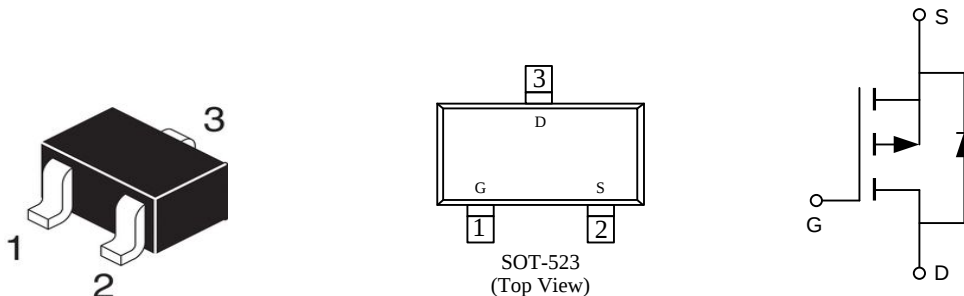
Product Summary		
V_{DSS}	I_D	$R_{DS(ON)}(m\Omega)TYP$
-20V	-0.45A	300 @ $V_{GS}=-4.5V$
	-0.35A	450 @ $V_{GS}=-2.5V$

Features

- Super high dense cell design for low $R_{DS(ON)}$
- Rugged and reliable
- Simple drive requirement
- 2.5V drive
- SOT-523 package

Package

- SOT-523



Ordering Information

Part Number	Storage Temperature	Package	Devices Per Reel
LN2307B	-55°C to +150°C	SOT-523	3000

Absolute Maximum Ratings

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

parameter		symbol	limit	unit
Drain-source voltage		V_{DSS}	-20	V
Gate-source voltage		V_{GSS}	± 12	V
Coutinuous drain current ($T_j=150^\circ\text{C}$)	$T_A=25^\circ\text{C}$	I_D	-1.1	A
	$T_A=80^\circ\text{C}$		-0.9	A
Pulsed drain current		I_{DM}	-2.4	A
Drain-source Diode forward current		I_S	-0.26	A
Power dissipation	$T_A=25^\circ\text{C}$	P_D	0.27	W
	$T_A=70^\circ\text{C}$		0.16	
Operating junction Temperature range		T_j	-55—150	$^\circ\text{C}$

■ Electrical Characteristics

(TA=25°C unless otherwise noted)

Parameter	Symbol	Condition	Min	Typ	Max	Unit
Static						
Drain-source breakdown voltage	$V_{(BR)DSS}$	$V_{GS}=0V, I_D=-250\mu A$	-20			V
Gate threshold voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=-250\mu A$	-0.35		-1.0	V
Gate leakage current	I_{GSS}	$V_{DS}=0V, V_{GS}=\pm 12V$			± 100	nA
Zero gate voltage drain current	I_{DSS}	$V_{DS}=-20V, V_{GS}=0V$			-1	μA
		$V_{DS}=-20V, V_{GS}=0V$ $T_j=55^\circ C$			-5	
On-state drain current	$I_{D(ON)}$	$V_{DS}\leq -4.5V, V_{GS}=-5V$	-0.7			A
Drain-source on-state resistance	$R_{DS(ON)}$	$V_{GS}=-4.5V, I_D=-0.45A$		0.23	0.30	Ω
		$V_{GS}=-2.5V, I_D=-0.35A$		0.37	0.45	
		$V_{GS}=-1.8V, I_D=-0.25A$		0.51	0.58	
Forward transconductance	g_{fs}	$V_{DS}=-10V, I_D=-0.25A$		1.0		S
Diode forward voltage	V_{SD}	$I_S=-0.15A, V_{GS}=0V$		-0.8	-1.2	V
Dynamic						
Total gate charge	Q_g	$V_{DS}=-10V$ $I_D=-0.6A$ $V_{GS}=-4.5V$		1.5	2.0	nC
Gate-source charge	Q_{gs}			0.3		
Gate-drain charge	Q_{gd}			0.35		
Turn-on delay time	$t_{d(ON)}$	$V_{DD}=-10V$ $V_{GEN}=-4.5V$ $I_D=-0.4A$ $R_L=10\Omega$ $R_G=6\Omega$		5	10	ns
Rise time	t_r			15	25	
Turn-off delay time	$t_{d(OFF)}$			8	15	
Fall time	t_f			1.4	1.8	

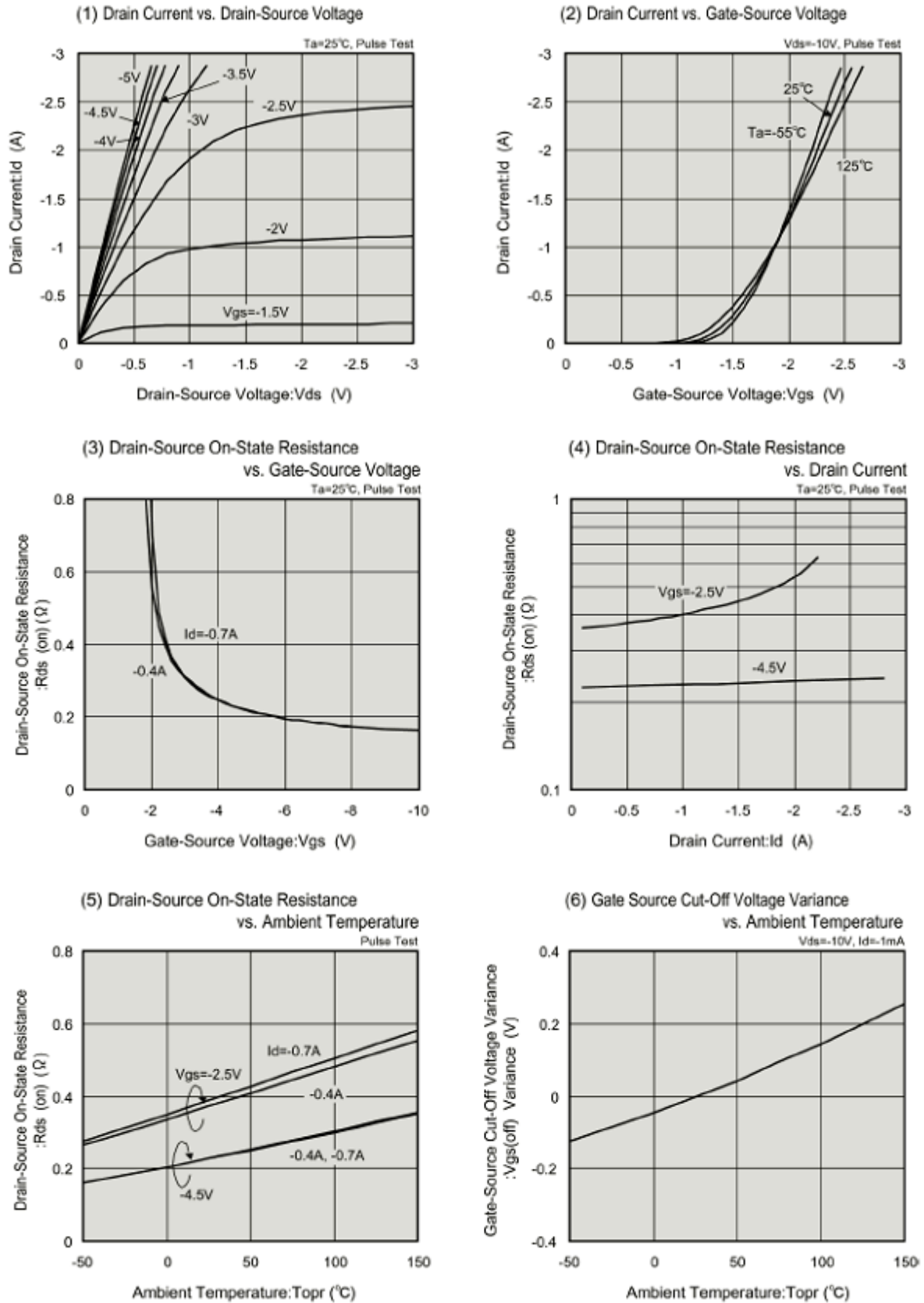
Notes:

- surface mounted on FR4 board, $t \leq 10\text{sec}$
- pulse test: pulse width $\leq 300\mu s$, duty $\leq 2\%$
- guaranteed by design, not subject to production testing

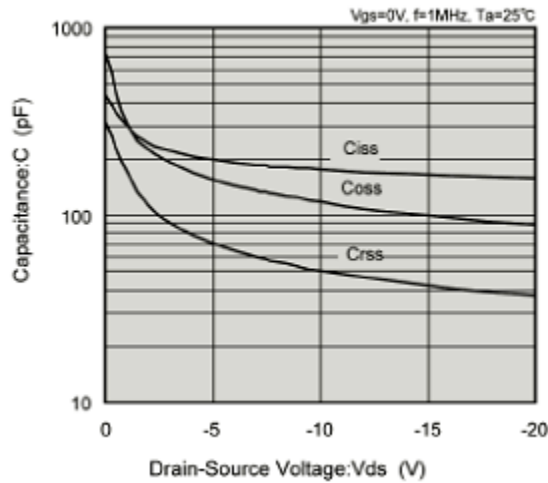
■ Thermal Characteristics

Thermal Resistance junction-to ambient	$R_{th JA}$	100	$^\circ C/W$
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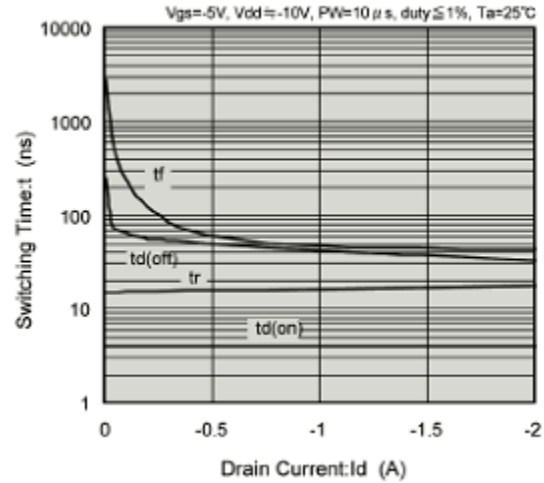
Typical Performance Characteristics



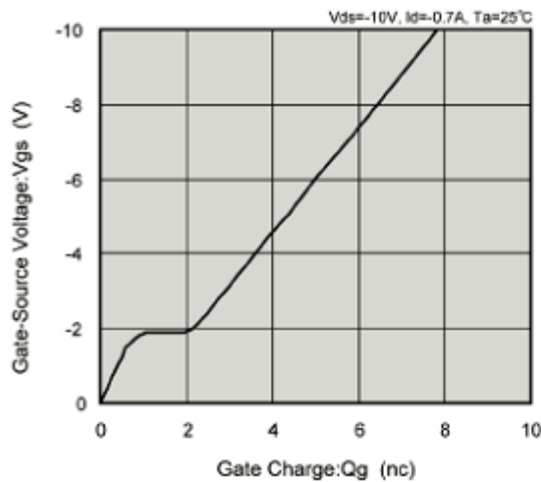
(7) Capacitance vs. Drain-Source Voltage



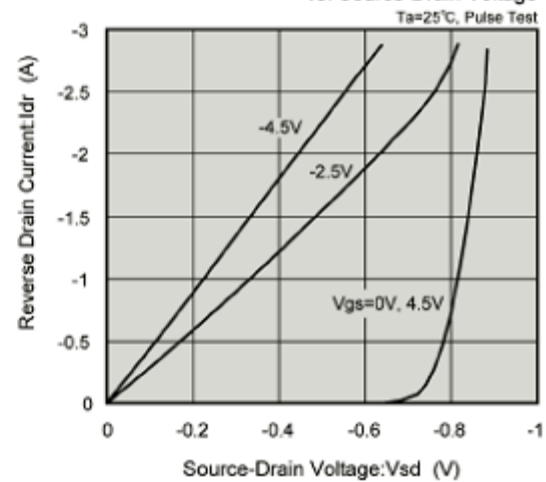
(8) SwitchingTime vs. Drain Current



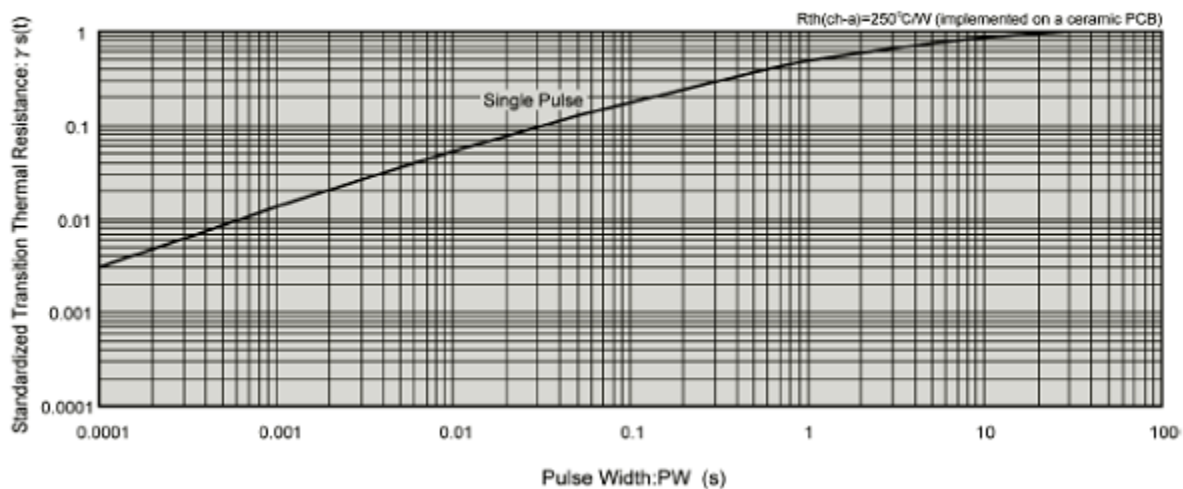
(9) Gate-Source Voltage vs. Gate Charge



(10) Reverse Drain Current vs. Source-Drain Voltage

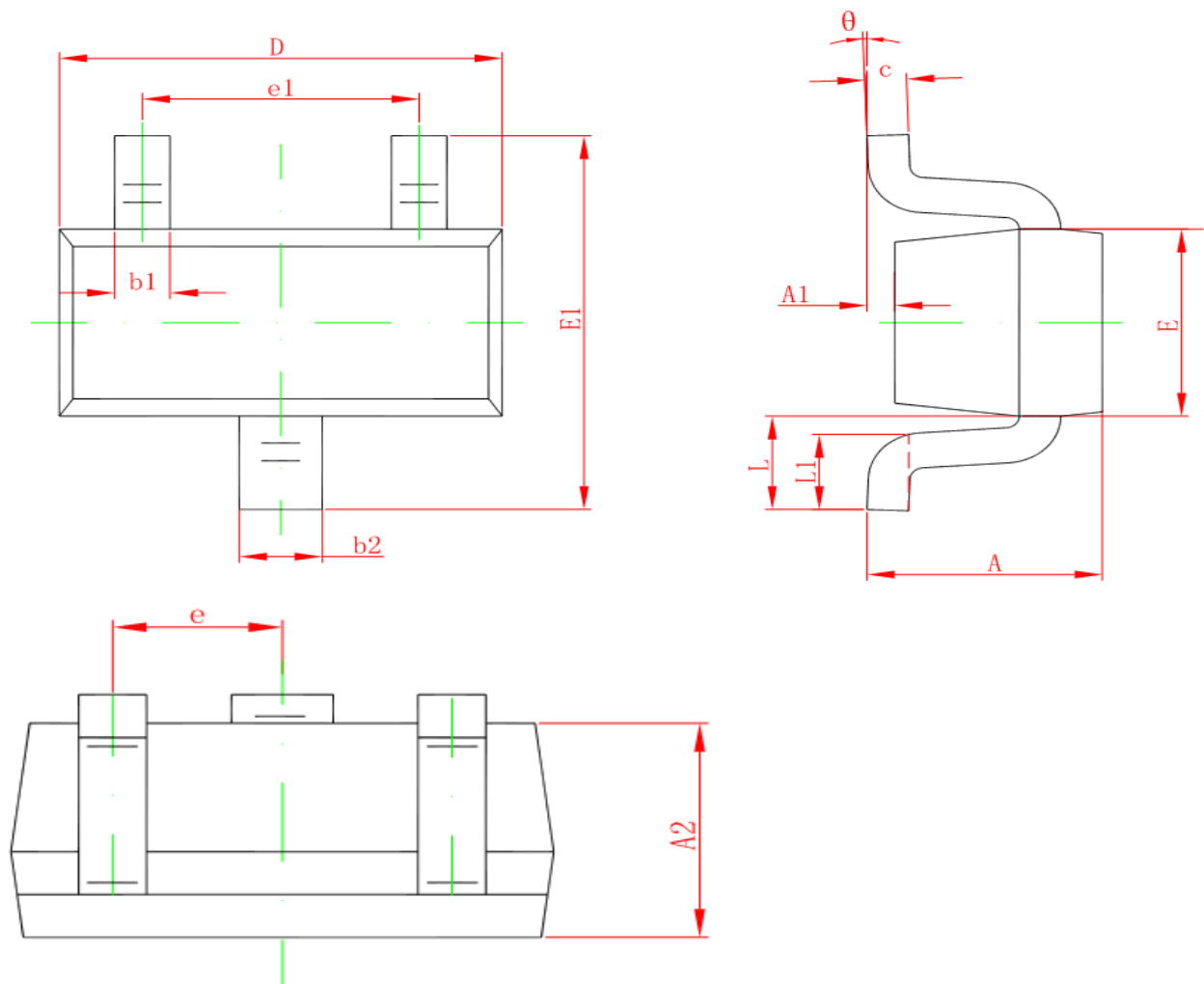


(11) Standardized Transition Thermal Resistance vs. Pulse Width



Package Information

- SOT-523



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	0.700	0.900	0.028	0.035
A1	0.000	0.100	0.000	0.004
A2	0.700	0.800	0.028	0.031
b1	0.150	0.250	0.006	0.010
b2	0.250	0.350	0.010	0.014
c	0.100	0.200	0.004	0.008
D	1.500	1.700	0.059	0.067
E	0.700	0.900	0.028	0.035
E1	1.450	1.750	0.057	0.069
e	0.500 TYP.		0.020 TYP.	
e1	0.900	1.100	0.035	0.043
L	0.400 REF.		0.016 REF.	
L1	0.260	0.460	0.010	0.018
θ	0°	8°	0°	8°