

**SE2312**

**Complementary Enhancement Mode Field Effect Transistor**

Revision:A

**Features**

- N-channel,  
 $V_{DS} = 20\text{ V}$   
 $R_{DS(ON)} = 60\text{m}\Omega @ V_{GS}=4.50\text{V} @ I_{DS}=2.8\text{A}$   
 $R_{DS(ON)} = 115\text{m}\Omega @ V_{GS}=2.50\text{V} @ I_{DS}=2.0\text{A}$
- P-channel,  
 $V_{DS} = -20\text{ V}$   
 $R_{DS(ON)} = 100\text{m}\Omega @ V_{GS}=-4.50\text{V} @ I_{DS}=-2.8\text{A}$   
 $R_{DS(ON)} = 150\text{m}\Omega @ V_{GS}=-2.50\text{V} @ I_{DS}=-2.0\text{A}$

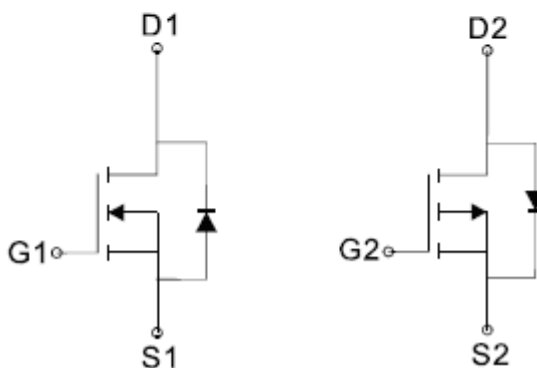
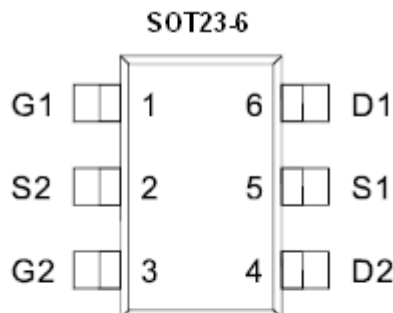
**Applications**

- Power Management in Desktop or DC/DC LCD display Converters

**Construction**

- Silicon epitaxial planer

**PIN CONFIGURATION.**



**Absolute maximum ratings (Ta=25°C)**

Parameter	Symbol	Max n-channel	Max P-channel	Unit
Drain-Source Voltage	$V_{DS}$	20	-20	V
Gate-Source Voltage	$V_{GSS}$	±8	±8	V
Drain Current-Continuous@ Current-Pulsed (Note 1)	$I_D$	3	-2.8	A
	$I_{DM}$	9	-8	A
Maximum Power Dissipation	$P_D$	3	0.9	W
Operating Junction and Storage Temperature Range	$T_J, T_{STG}$	-55 To 150	-55 To 150	°C

**THERMAL CHARACTERISTICS**

Thermal Resistance, Junction-to-Ambient (Note 2)	$R_{\theta JA}$	62.5	62.5	°C/W
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**N-Channel Electrical Characteristics (T<sub>J</sub>=25°C unless otherwise noted)**

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
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**OFF/ON CHARACTERISTICS**

Drain-Source Breakdown Voltage	$BV_{DSS}$	$I_D=250\ \mu\text{A}, V_{GS}=0\text{ V}$	20			V
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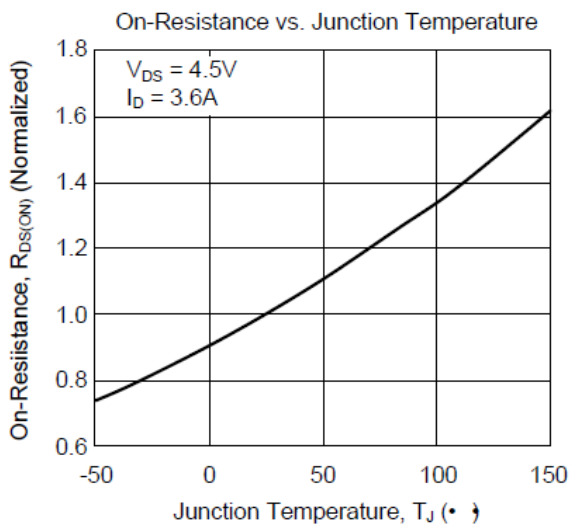
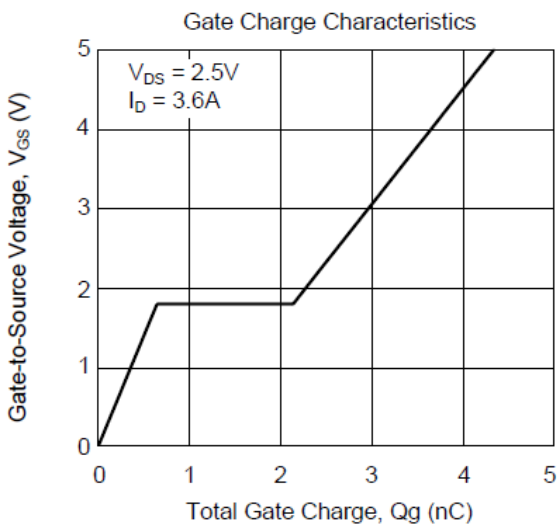
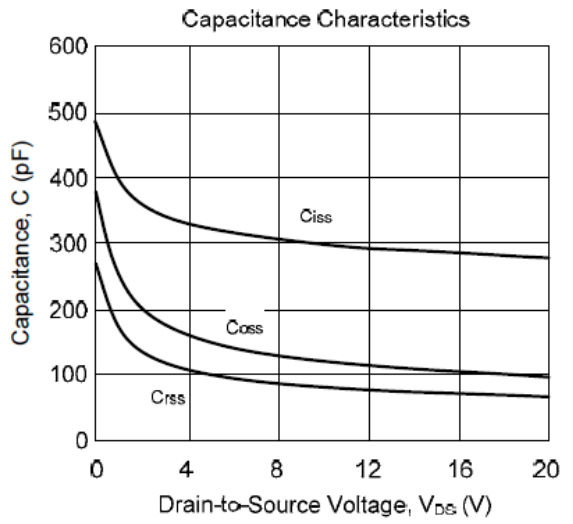
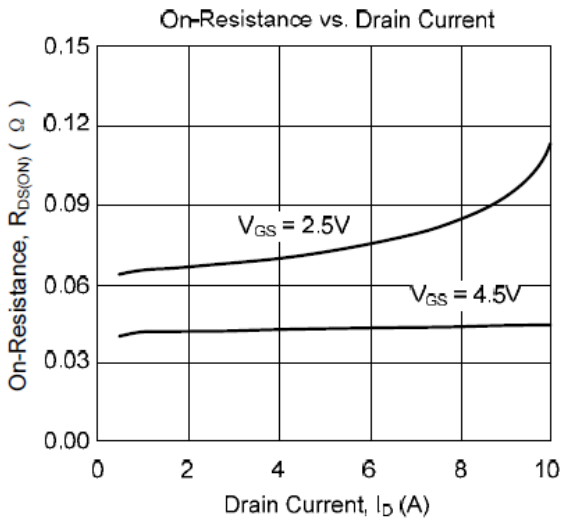
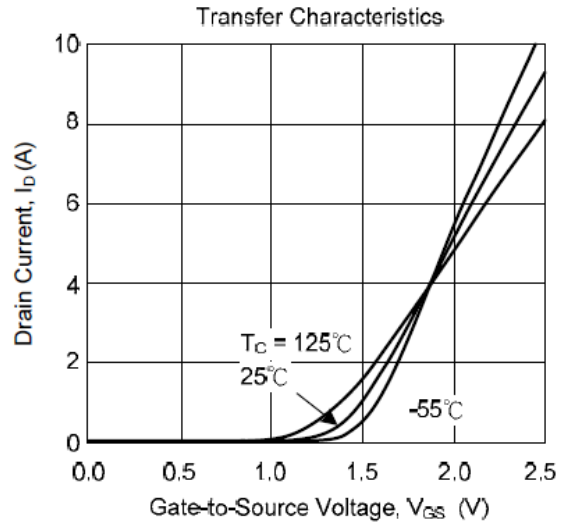
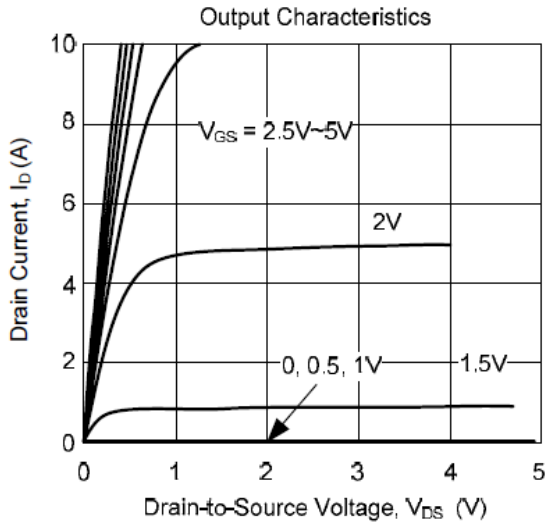
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Zero Gate Voltage Drain Current	$I_{DSS}$	$V_{DS}=20\text{ V}, V_{GS}=0\text{ V}$			1	$\mu\text{ A}$
Gate-Body Leakage Current	$I_{GSS}$	$V_{GS}=\pm 8\text{ V}, V_{DS}=0\text{ V}$			$\pm 100$	nA
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=250\mu\text{ A}$	0.6		1.2	V
Drain-Source On-State Resistance	$R_{DS(ON)}$	$V_{GS}=4.5\text{ V}, I_D=2.8\text{ A}$	-	43	60	$\text{m}\Omega$
		$V_{GS}=2.5\text{ V}, I_D=2.0\text{ A}$		52	115	$\text{m}\Omega$
		$V_{GS}=1.8\text{ V}, I_D=2.0\text{ A}$		80	130	$\text{m}\Omega$
<b>DYNAMIC CHARACTERISTICS (Note4)</b>						
Input Capacitance	$C_{iss}$			450		pF
Output Capacitance	$C_{oss}$	$V_{GS}=0\text{ V}, V_{DS}=10\text{ V}, f=1\text{ MHz}$		70		pF
Reverse Transfer Capacitance	$C_{rss}$			43		pF
Turn-On Time	$T_{ON}$		$V_{DS}=10\text{ V}, I_D=1\text{ A}, V_{GS}=4.5\text{ V}, R_{GEN}=6\Omega$	-	7	15
Turn-Off Time	$T_{OFF}$	-		16	60	ns
Turn-on Rise Time	$T_r$	-		55	80	ns
Turn-on Fall Time	$T_f$	-		20	25	ns
Total Gate Charge	$Q_g(10)$	$V_{DS}=10\text{ V}, I_D=3.6\text{ A}, V_{GS}=4.5\text{ V}$			5.2	10
Gate-Source Charge	$Q_{gs}$			0.65	.	nC
Gate-Drain Charge	$Q_{gd}$			1.5		nC
Drain-Source Diode Forward Voltage	$V_{SD}$	$V_{GS}=0\text{ V}, I_S=1.0\text{ A}$		0.76	1.2	V
Maximum Continuous rain-Source Diode Forward Current	$I_S$				1.6	A
<b>P-Channel Electrical Characteristics (T<sub>J</sub>=25°C unless otherwise noted)</b>						
Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
<b>OFF/ON CHARACTERISTICS</b>						
Drain-Source Breakdown Voltage	$BV_{DSS}$	$I_D=-250\mu\text{ A}, V_{GS}=0\text{ V}$	-20			V
Zero Gate Voltage Drain Current	$I_{DSS}$	$V_{DS}=20\text{ V}, V_{GS}=0\text{ V}$			-1	$\mu\text{ A}$
Gate-Body leakage current	$I_{GSS}$	$V_{DS}=0\text{ V}, V_{GS}=\pm 10\text{ V}$			$\pm 0.1$	$\mu\text{ A}$

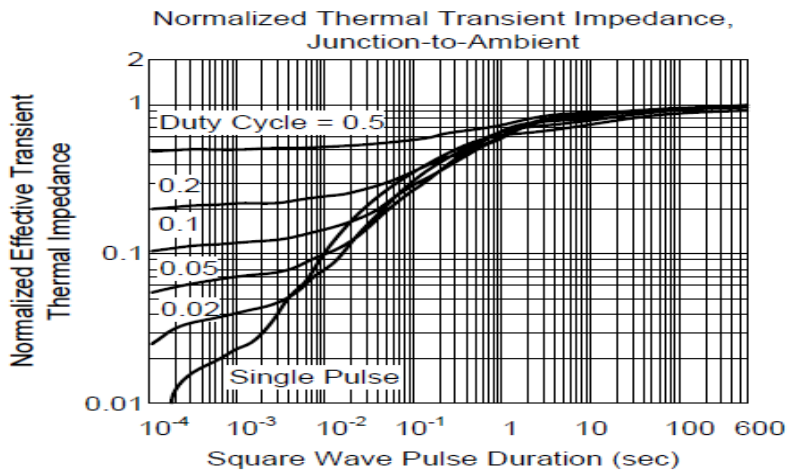
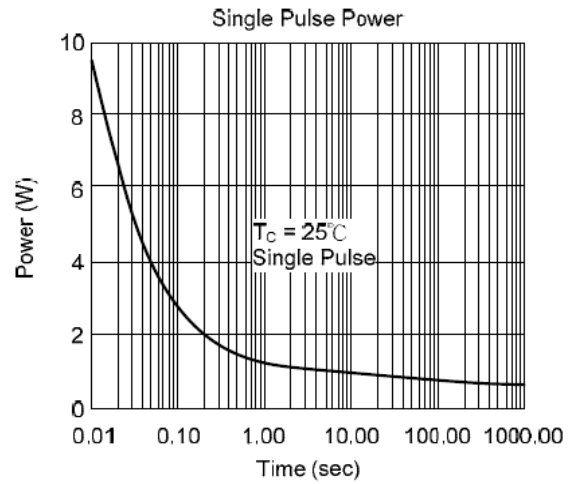
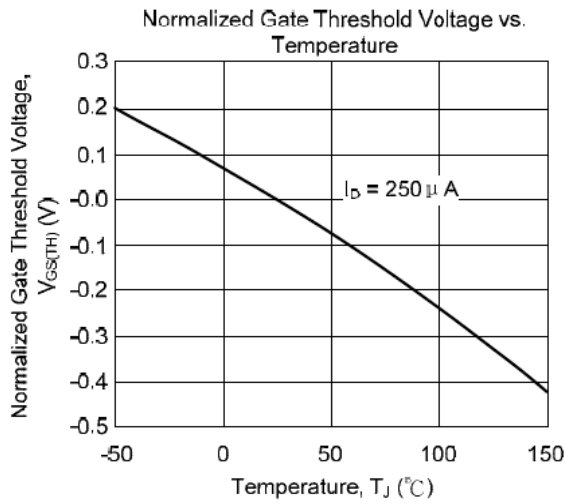
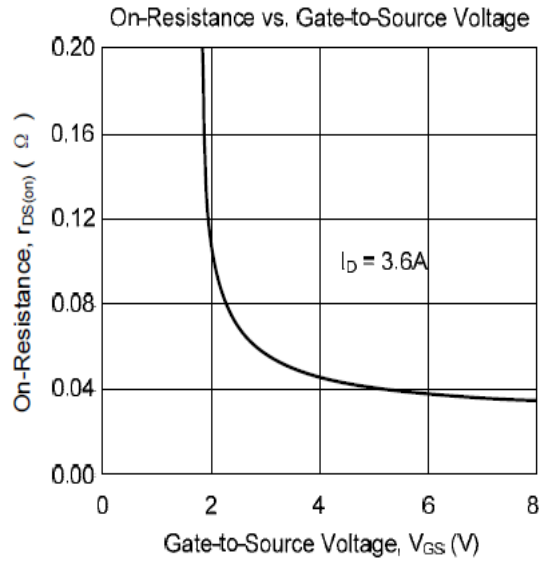
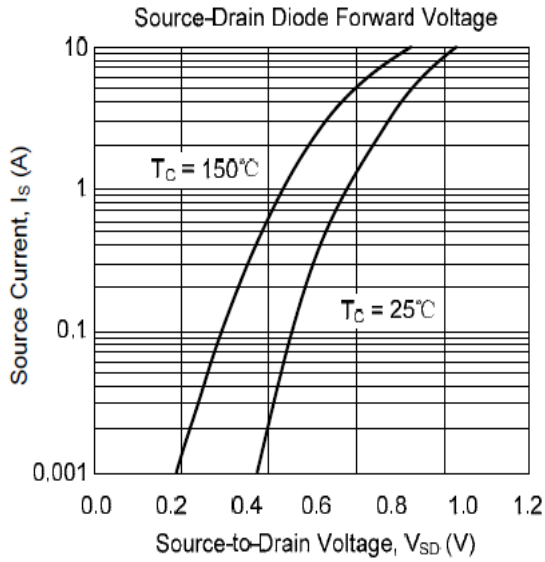
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Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}$ $I_D=-250\ \mu$ A	-0.45			V
Static Drain-Source On-Resistance <sup>2</sup>	$R_{DS(on)}$	$V_{GS}=-4.50V$ , $I_D=-2.8$ A	-	69	100	$m\ \Omega$
		$V_{GS}=-2.5V$ , $I_D=-2A$		83	150	$m\Omega$
<b>DYNAMIC CHARACTERISTICS (Note4)</b>						
Input Capacitance	$C_{iss}$			373		pF
Output Capacitance	$C_{oss}$	$V_{GS}=0V$ , $V_{DS}=10V$ , $f=1MHz$		138		pF
Reverse Transfer Capacitance	$C_{rss}$			52		pF
Total Gate Charge <sup>2</sup>	$Q_g$			15.2		nC
Gate Source Charge	$Q_{gs}$	$V_{GS}=-4.5V$ , $V_{DS}$ $=-6V$ , $I_D=-2.8A$		5.5		nC
Gate Drain Charge	$Q_{gd}$			2.7		nC
Turn-On DelayTime <sup>2</sup>	$t_{d(on)}$	$V_{GS}=-4.5V$ , $V_{DD}=-6V$ , $R_L=6\ \Omega$ , $R_G=6\ \Omega$ $I_D=-1A$			17.3	ns
Turn-Off DelayTime	$t_{d(off)}$				36.0	
Turn-On Rise Time	$t_{d(r)}$				3.7	
Turn-Off Fall Time	$t_{d(f)}$				3.2	

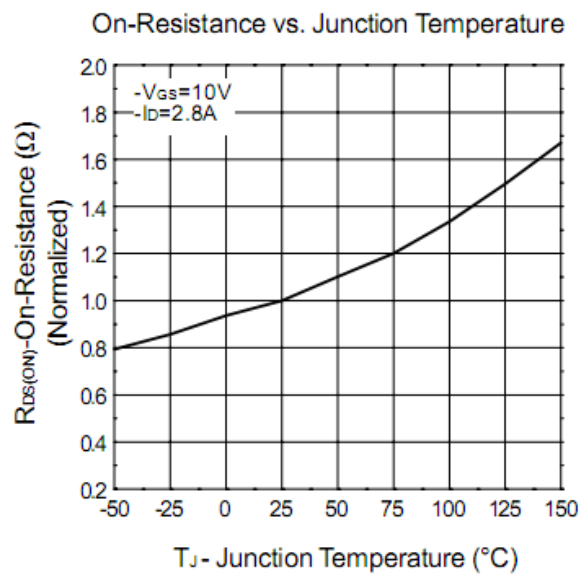
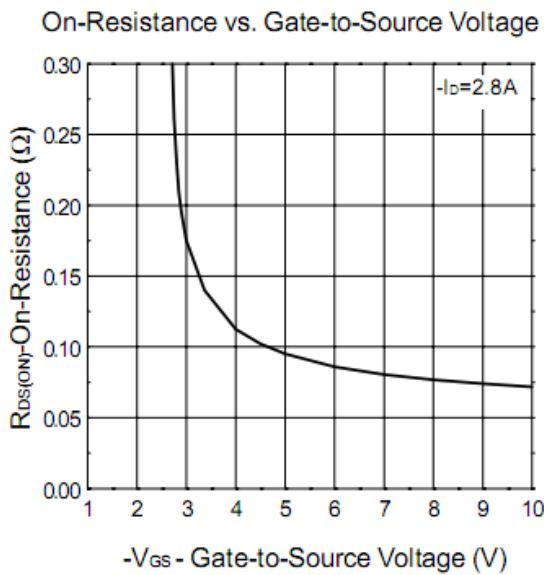
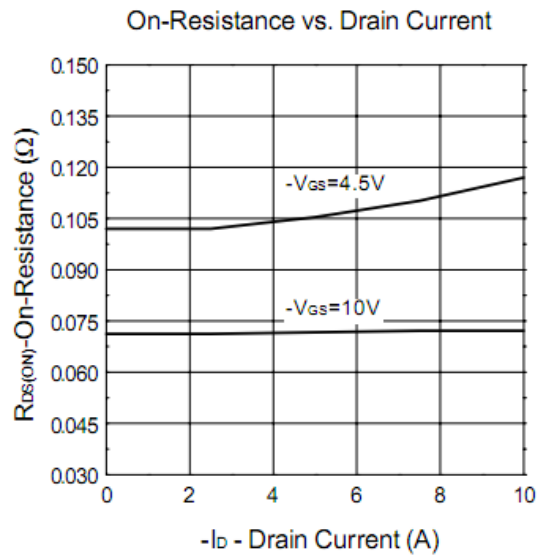
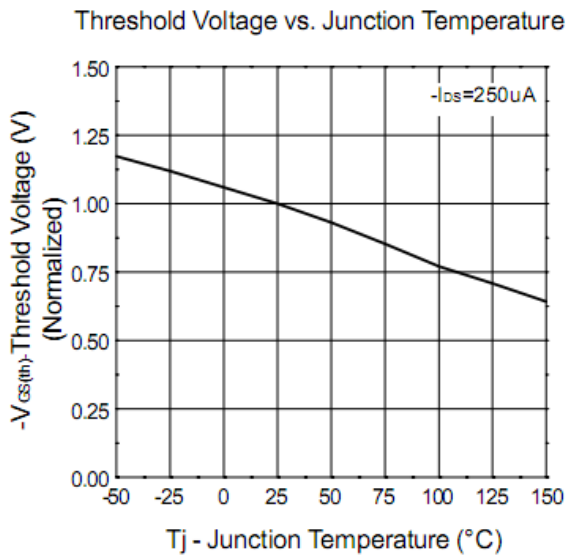
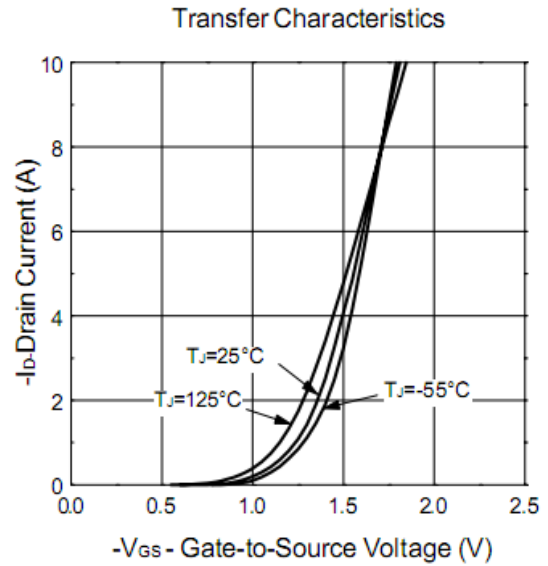
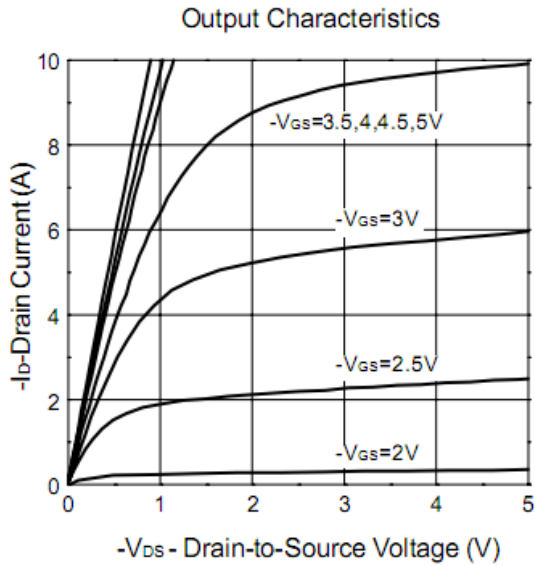
**N-CHANNEL TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS**

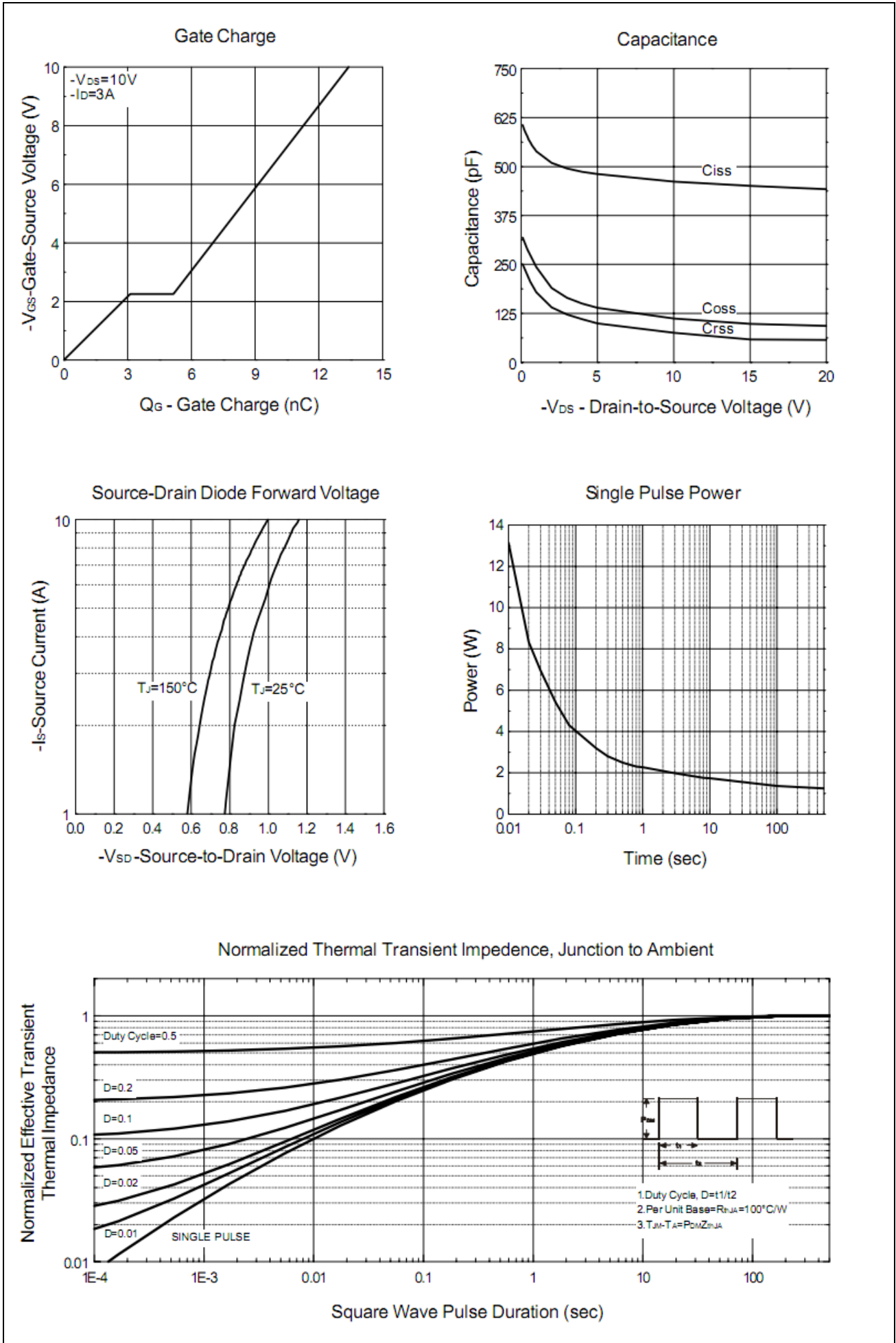


**N-CHANNEL TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS**



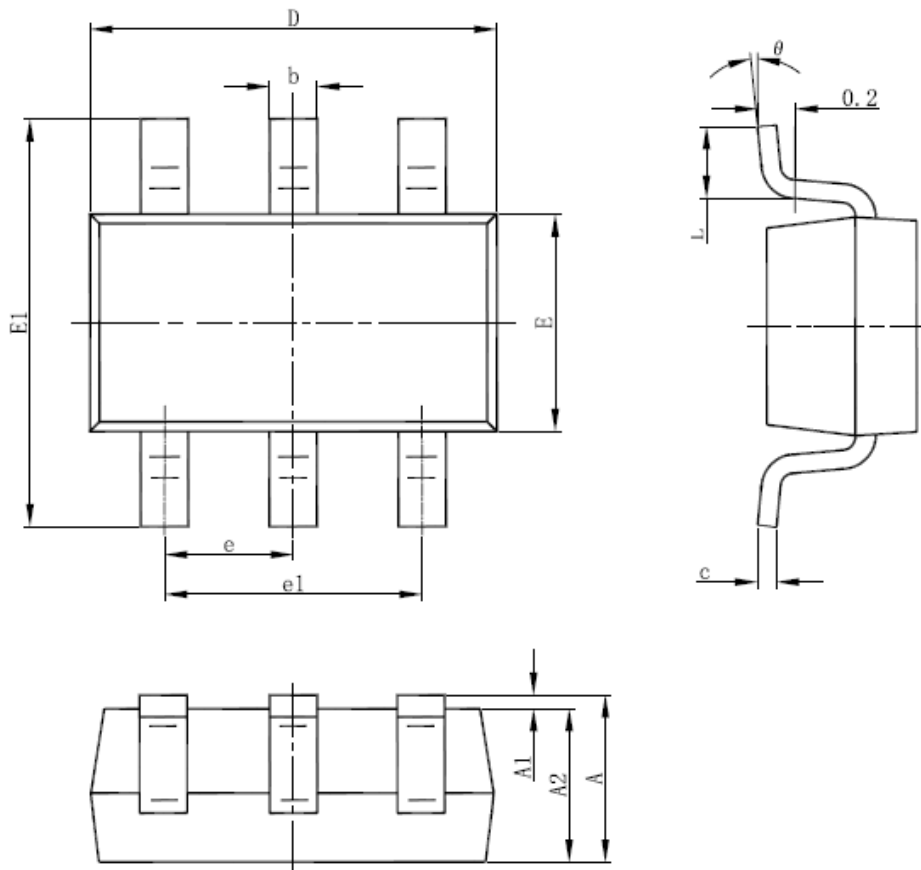
P-CHANNEL TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS





# SE2312

## SOT-23-6 PACKAGE OUTLINE DIMENSIONS



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	1.050	1.250	0.041	0.049
A1	0.000	0.100	0.000	0.004
A2	1.050	1.150	0.041	0.045
b	0.300	0.500	0.012	0.020
c	0.100	0.200	0.004	0.008
D	2.820	3.020	0.111	0.119
E	1.500	1.700	0.059	0.067
E1	2.650	2.950	0.104	0.116
e	0.950(BSC)		0.037(BSC)	
e1	1.800	2.000	0.071	0.079
L	0.300	0.600	0.012	0.024
$\theta$	0°	8°	0°	8°



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