General Features

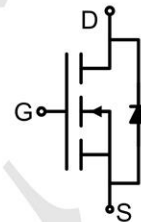| $V_{(BR)DSS}$	$R_{DS(on)}$MAX	I_D
60 V	105mΩ@10V	3A
	125mΩ@4.5V	

Application

Load/Power Switching
Interfacing Switching
Battery Management for Ultra Small Portable
Logic Level Shift

Package and Pin Configuration

SOT23
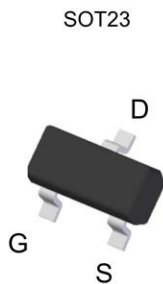
Circuit diagram

Marking:

E8

Absolute Maximum Ratings (T_A=25℃ unless otherwise noted)

Parameter	Symbol	Value	Unit
Drain-Source Voltage	V_{DS}	60	V
Gate-Source Voltage	V_{GS}	±20	V
Continuous Drain Current	I_D	3	A
Pulsed Drain Current (note 1)	I_{DM}	10	A
Power Dissipation	P_D	0.35	W
Thermal Resistance from Junction to Ambient (note 2)	$R_{\theta JA}$	357	℃/W
Junction Temperature	T_J	150	℃
Storage Temperature	T_{STG}	-55~+150	℃

Electrical Characteristics (T$_A$=25℃ unless otherwise noted)

Parameter	Symbol	Test Condition	Min	Typ	Max	Unit
STATIC CHARACTERISTICS						
Drain-source breakdown voltage	V$_{(BR)DSS}$	V$_{GS}$ = 0V, I$_D$ =250µA	60			V
Zero gate voltage drain current	I$_{DSS}$	V$_{DS}$ =60V, V$_{GS}$ = 0V			1	µA
Gate-body leakage current	I$_{GSS}$	V$_{GS}$ =±20V, V$_{DS}$ = 0V			±100	nA
Gate threshold voltage (note 3)	V$_{GS(th)}$	V$_{DS}$ =V$_{GS}$, I$_D$ =250µA	0.5		2	V
Drain-source on-resistance (note 3)	R$_{DS(on)}$	V$_{GS}$ =10V, I$_D$ =3A			105	mΩ
		V$_{GS}$ =4.5V, I$_D$ =3A			125	mΩ
Forward tranconductance (note 3)	g$_{FS}$	V$_{DS}$ =15V, I$_D$ =2A	1.4			S
Diode forward voltage (note 3)	V$_{SD}$	I$_S$=3A, V$_{GS}$ = 0V			1.2	V
DYNAMIC CHARACTERISTICS (note 4)						
Input Capacitance	C$_{iss}$	V$_{DS}$ =30V, V$_{GS}$ =0V, f =1MHz		247		pF
Output Capacitance	C$_{oss}$			34		pF
Reverse Transfer Capacitance	C$_{rss}$			19.5		pF
SWITCHING CHARACTERISTICS (note 4)						
Turn-on delay time	t$_{d(on)}$	V$_{GS}$=10V, V$_{DD}$=30V, I$_D$=1.5A, R$_{GEN}$=1Ω		6		ns
Turn-on rise time	t$_r$			15		ns
Turn-off delay time	t$_{d(off)}$			15		ns
Turn-off fall time	t$_f$			10		ns
Total Gate Charge	Q$_g$	V$_{DS}$ =30V, V$_{GS}$ =4.5V, I$_D$ =3A		6		nC
Gate-Source Charge	Q$_{gs}$			1		nC
Gate-Drain Charge	Q$_{gd}$			1.3		nC

Typical Electrical and Thermal Characteristics (Curves)
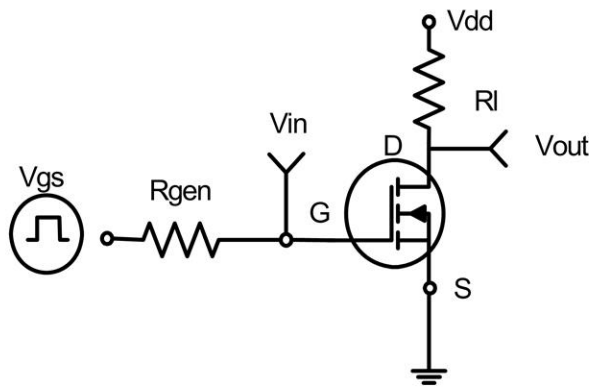
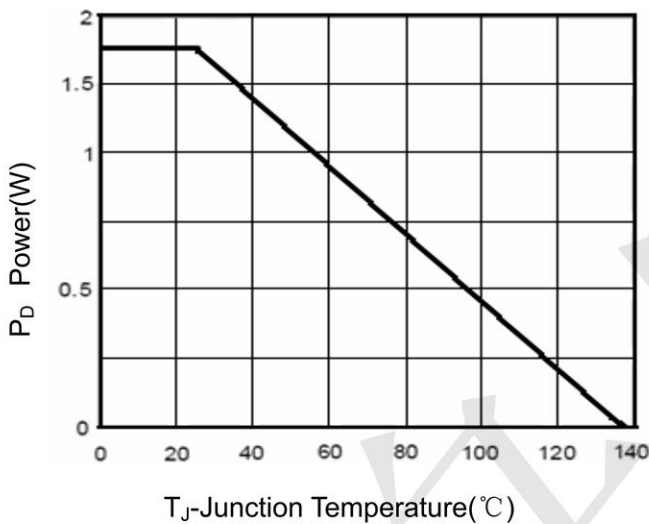**Figure 1:Switching Test Circuit**
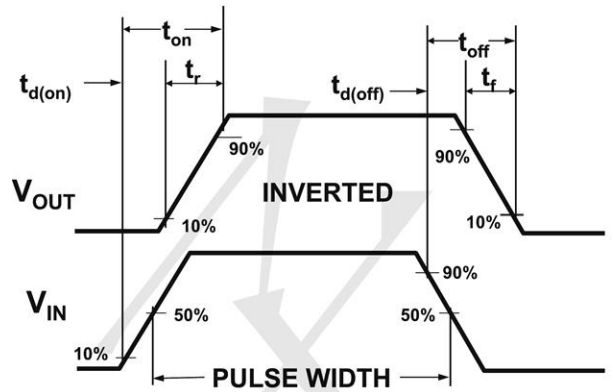
Figure 2:Switching Waveforms

T$_J$-Junction Temperature(℃)
Figure 3 Power Dissipation

T$_J$-Junction Temperature(℃)
Figure 4 Drain Current
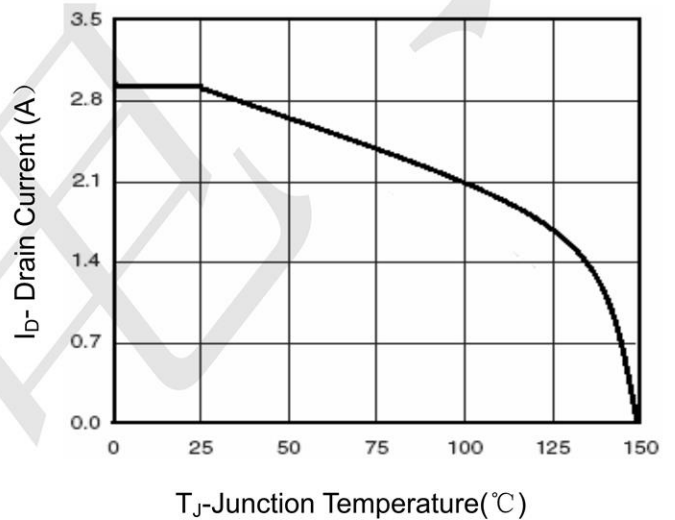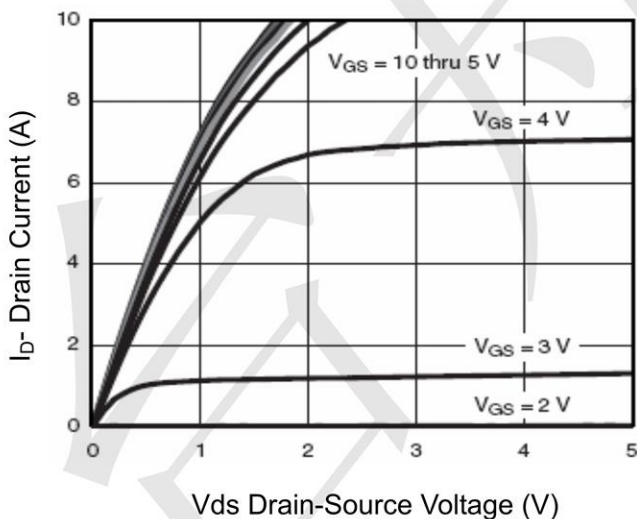
Vds Drain-Source Voltage (V)
Figure 5 Output Characteristics
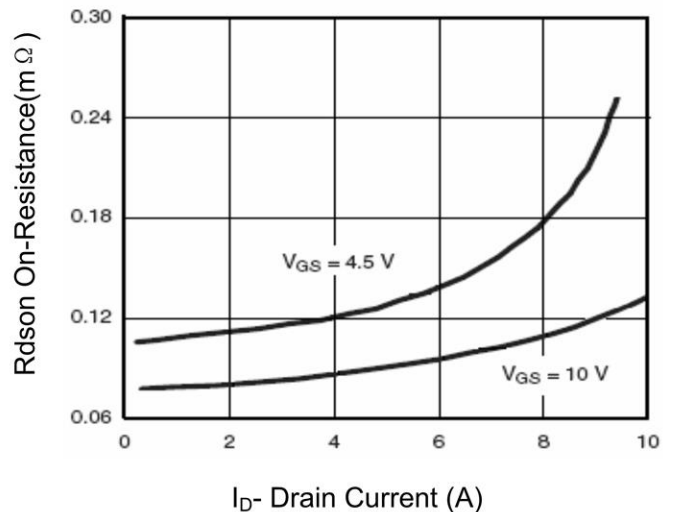
I$_D$- Drain Current (A)
Figure 6 Drain-Source On-Resistance

Typical Electrical and Thermal Characteristics (Curves)
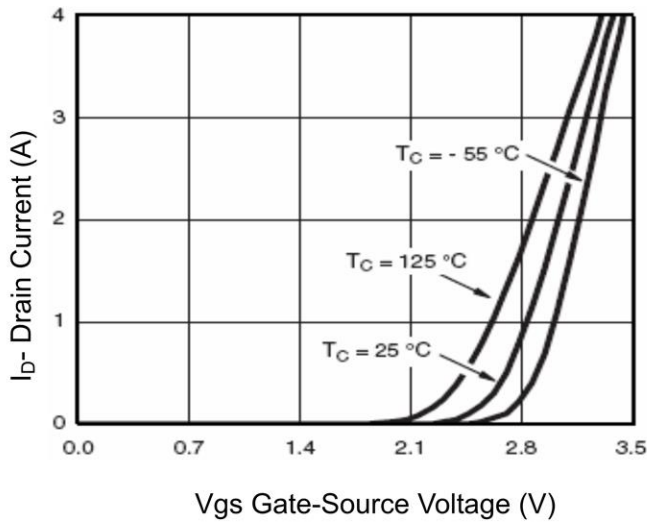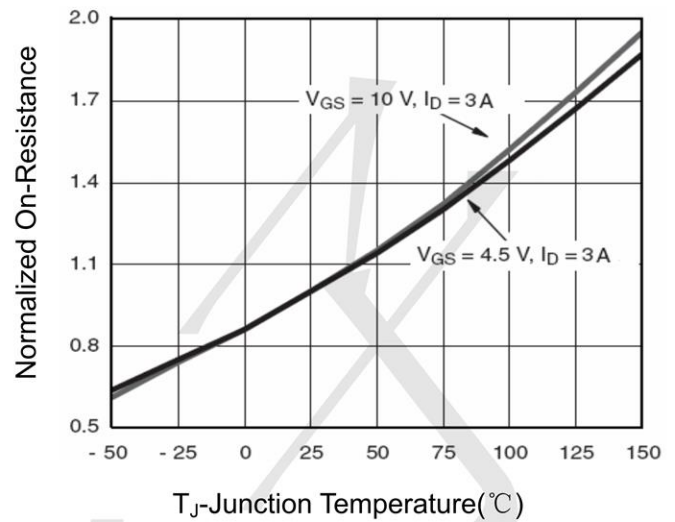
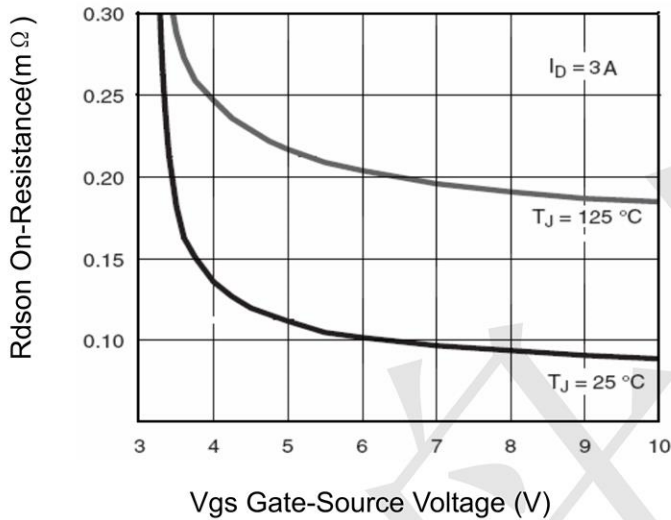**Figure 7 Transfer Characteristics**

Figure 8 Drain-Source On-Resistance
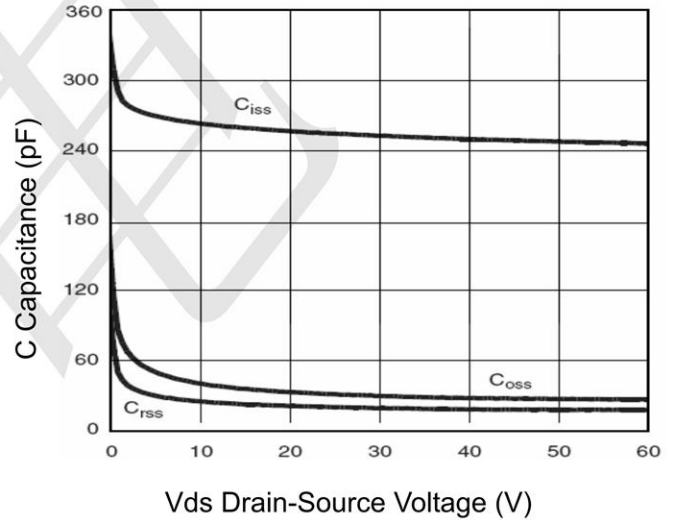
Figure 9 Rdson vs Vgs

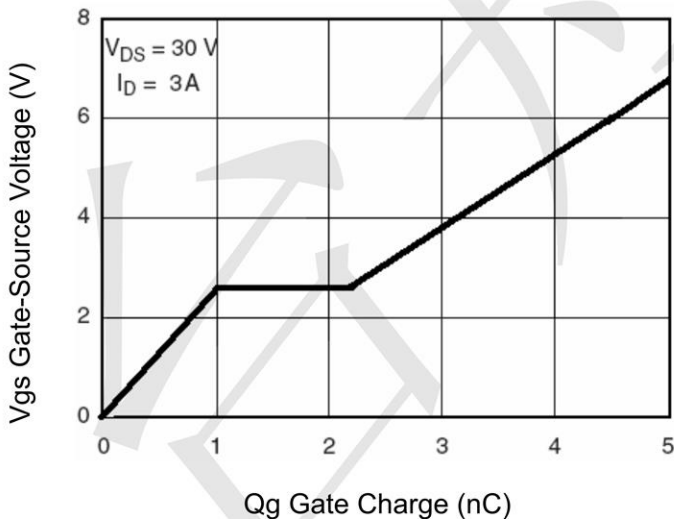**Figure 10 Capacitance vs Vds**

Figure 11 Gate Charge

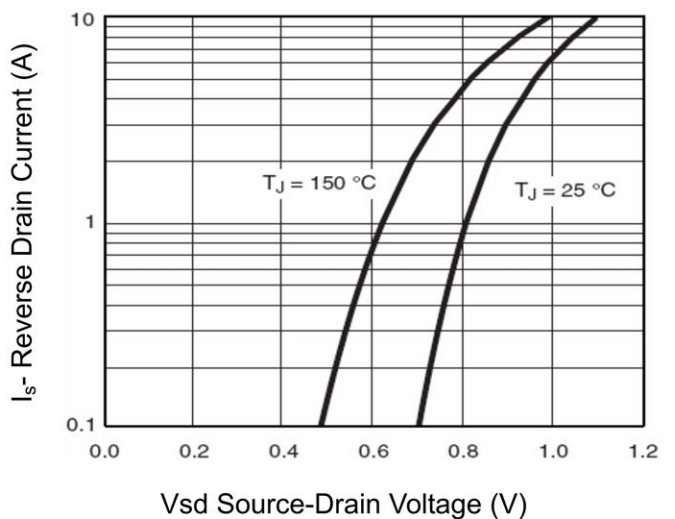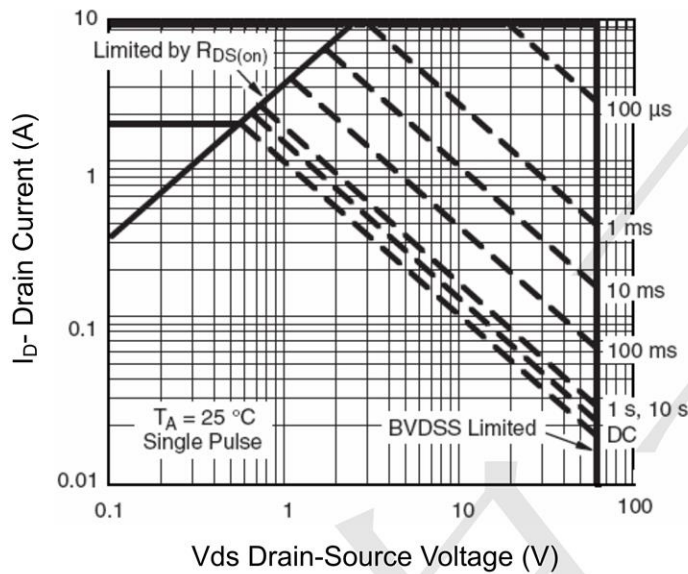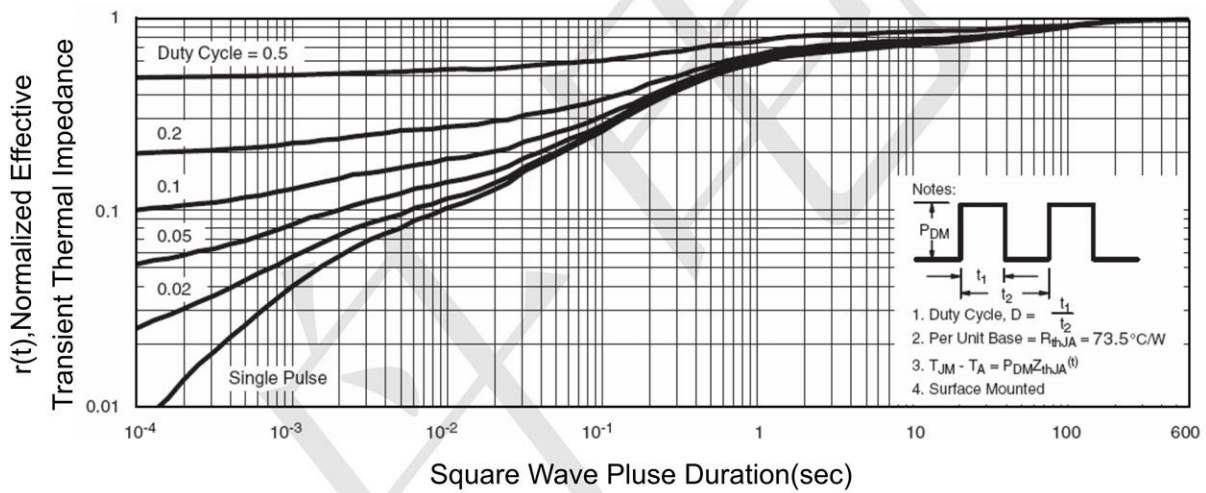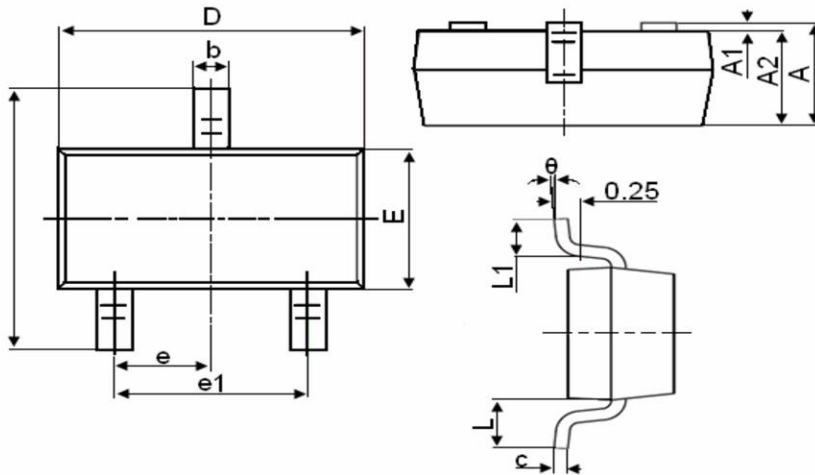**Figure 12 Source- Drain Diode Forward**

Figure 13 Safe Operation Area

Figure 14 Normalized Maximum Transient Thermal Impedance

Package Outline Dimensions (SOT-23)

Symbol	Dimensions in Millimeters	
	MIN.	MAX.
A	0.900	1.150
A1	0.000	0.100
A2	0.900	1.050
b	0.300	0.500
c	0.080	0.150
D	2.800	3.000
E	1.200	1.400
E1	2.250	2.550
e	0.950TYP	
e1	1.800	2.000
L	0.550REF	
L1	0.300	0.500
θ	0°	8°

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