MOSPEC **4Z5NP30S6**

30V N+P Channel MOSFET

DESCRIPTION：

V_{DS}	30V	-30V
I_D	6.0A	-4.5A
$R_{DS(ON)\_Typ.}$ @V_{GS}=±10V	33mΩ	46mΩ

·N+P Channel

·Very Low on-resistance

·SOT23-6L Package

·Pb−Free, RoHS Compliant

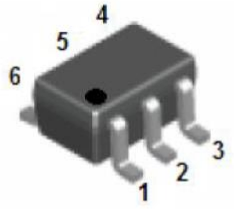
TYPICAL APPLICATIONS：

·DC−DC Conversion Circuits

·Load/Power Switching with Level Shift

·Switching circuits

·Power supply converter



SOT-23-6L

ABSOLUTE MAXIMUM RATINGS (at T_C = 25 °C, unless otherwise specified)

Characteristic	Condition	Symbol	N MOS	P MOS	Unit
Gate-Source Voltage		V_{GS}	±20	±20	V
Drain-Source Breakdown Voltage		$V_{(BR)DSS}$	30	-30	V
Diode Continuous Forward Current		I_S	6.0	-4.5	A
Pulsed Drain Current [(1)]		I_{DM}	30	-25	A
Continuous Drain Current	Tc=25℃ Tc=70℃	I_D	6.0 4.8	-4.5 -3.6	A
Power dissipation	T_C=25℃ T_A=70℃	P_D	1.56 1.0		W
Thermal Resistance from Junction to Ambient		Eth_{JA}	80		℃/W
Junction & Storage temperature Range		T_J, T_{STG}	-55~150		℃

Notes： 1. Pulse width limited by maximum allowable junction temperature.

ELECTRICAL CHARATERISTICS (at T_J = 25 °C, unless otherwise specified) -N-Channel

Characteristic	Symbol	Min.	Typ.	Max.	Unit
Drain-Source Breakdown Voltage VGS = 0V, ID = 250uA	$V_{(BR)DSS}$	30			V
Zero Gate Voltage Drain Current VDS = 30 V, VGS = 0 V, T_j = 25 °C VDS = 24 V, VGS = 0 V, T_j = 125 °C	I_{DSS}			1.0 100	uA
Gate-Source Leakage Current VGS = ±20V, VDS = 0V	I_{GSS}			±100	nA
Gate-Source threshold voltage VDS = VGS, ID = 250uA	$V_{GS(th)}$	1.0	1.6	2.5	V
Drain-Source On-State Resistance VGS = 10V, ID = 3A, VGS = 4.5V, ID = 2A,	$R_{DS(on)}$		33 45	45 60	mΩ
Input capacitance f=1MHz, VDS= 15 V, VGS=0 V	C_{iss}		467		pF
Output capacitance f=1MHz, VDS= 15 V, VGS=0 V	C_{oss}		45		pF
Reverse transfer capacitance f=1MHz, VDS= 15 V, VGS=0 V	C_{rss}		35		pF
Total Gate Charge VDS= 15V, ID= 4A,VGS= 10V	Q_G		10.4		nC
Gate to Source Charge VDS= 15V, ID= 4A,VGS= 10V	Q_{GS}		1.6		nC
Gate to Drain Charge VDS= 15V, ID= 4A,VGS= 10V	Q_{GD}		2.1		nC
Turn-on delay time VDD= 15 V, VGS= 10V, ID= 1A, R_G =3.3Ω	$t_{d\ (ON)}$		4.4		ns
Rise time VDD= 15 V, VGS= 10V, ID= 1A, R_G =3.3Ω	tr		2.6		ns
Turn-off delay time VDD= 15 V, VGS= 10V, ID= 1A, R_G =3.3Ω	$t_{d\ (OFF)}$		25.5		ns
Fall time VDD= 15 V, VGS= 10V, ID= 1A, R_G =3.3Ω	tf		3.3		ns
Diode Forward Voltage VGS = 0V, I_S = 2A	V_{SD}			1.2	V

ELECTRICAL CHARATERISTICS (at T_J = 25 °C, unless otherwise specified) -P-Channel

Characteristic	Symbol	Min.	Typ.	Max.	Unit
Drain-Source Breakdown Voltage VGS = 0V, ID = -250uA	$V_{(BR)DSS}$	-30			V
Zero Gate Voltage Drain Current VDS = -30 V, VGS = 0 V, T_j = 25 °C VDS = -24 V, VGS = 0 V, T_j = 125 °C	I_{DSS}			-1.0 -100	uA
Gate-Source Leakage Current VGS = ±20V, VDS = 0V	I_{GSS}			±100	nA
Gate-Source threshold voltage VDS = VGS, ID = -250uA	$V_{GS(th)}$	-1.0	-1.4	-2.5	V
Drain-Source On-State Resistance VGS = -10V, ID = -3A, VGS = -4.5V, ID = -2A,	$R_{DS(on)}$		46 63	60 80	mΩ
Input capacitance f=1MHz, VDS= -15 V, VGS=0 V	C_{iss}		563		pF
Output capacitance f=1MHz, VDS= -15 V, VGS=0 V	C_{oss}		67		pF
Reverse transfer capacitance f=1MHz, VDS= -15 V, VGS=0 V	C_{rss}		57		pF
Total Gate Charge VDS= -15V, ID= -4A,VGS= -10V	Q_G		8.2		nC
Gate to Source Charge VDS= -15V, ID= -4A,VGS= -10V	Q_{GS}		1.4		nC
Gate to Drain Charge VDS= -15V, ID= -4A,VGS= -10V	Q_{GD}		2.7		nC
Turn-on delay time VDD= -15 V, VGS= -10V, ID= -1.5A, R_G =3.3Ω	$t_{d\ (ON)}$		10		ns
Rise time VDD= -15 V, VGS= -10V, ID= -1.5A, R_G =3.3Ω	tr		29		ns
Turn-off delay time VDD= -15 V, VGS= -10V, ID= -1.5A, R_G =3.3Ω	$t_{d\ (OFF)}$		23		ns
Fall time VDD= -15 V, VGS= -10V, ID= -1.5A, R_G =3.3Ω	tf		38		ns
Diode Forward Voltage VGS = 0V, I_{SD} = -2A	V_{SD}			-1.2	V

Typical Performance Characteristics- N-Channel

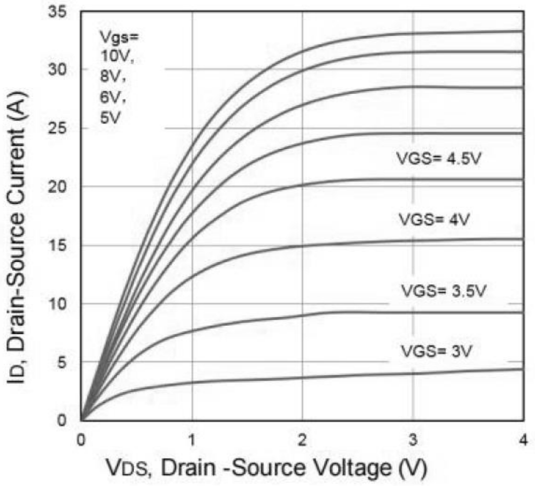


Figure 1 Output Characteristics

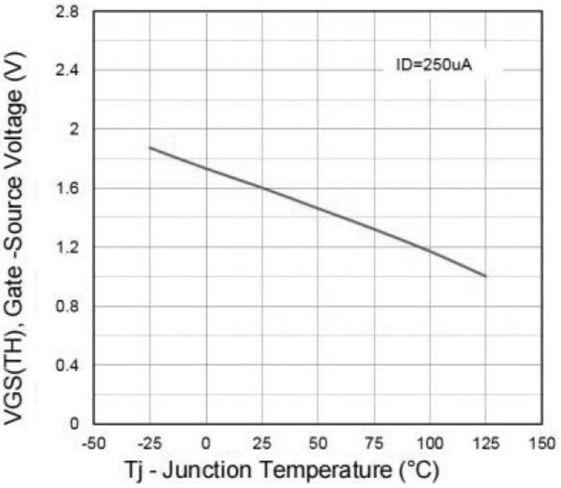


Figure 2. Normalized Threshold Voltage Vs. Temp.

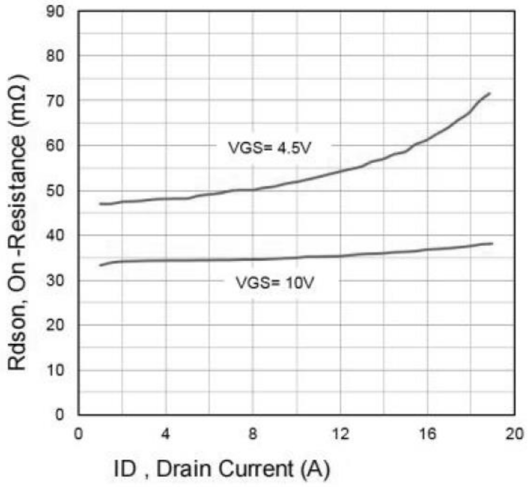


Figure 3. On-Resistance vs. Drain Current and Gate

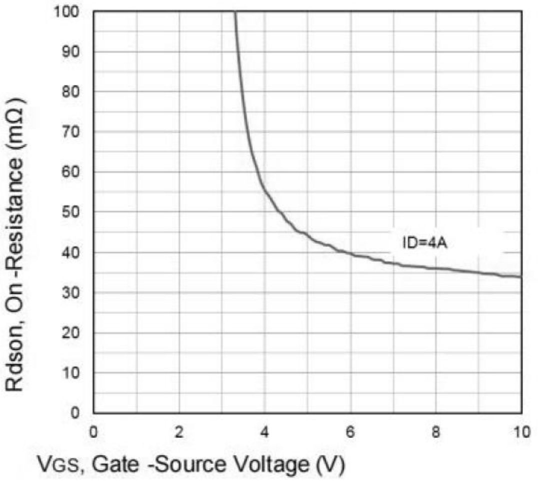


Figure 4. On-Resistance vs. Gate Source Voltage

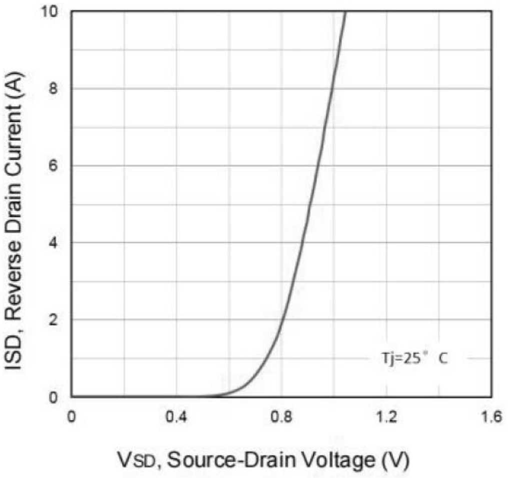


Figure 5. Source-Drain Diode Forward Voltage

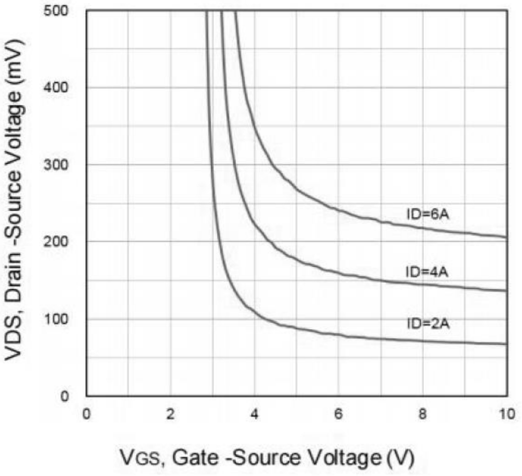


Figure 6. Drain-Source Voltage vs Gate-Source Voltage

Typical Performance Characteristics

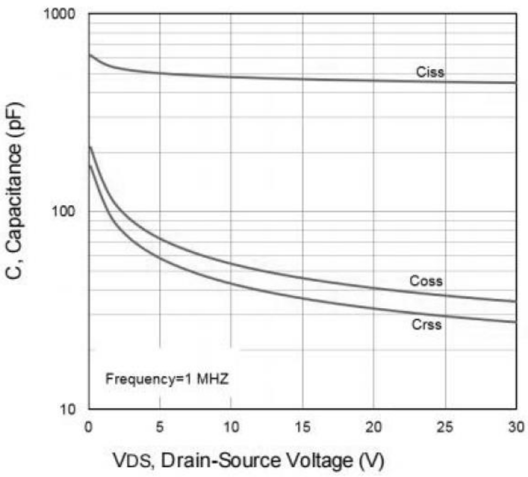


Figure 7. Capacitance Vs. Drain-Source Voltage

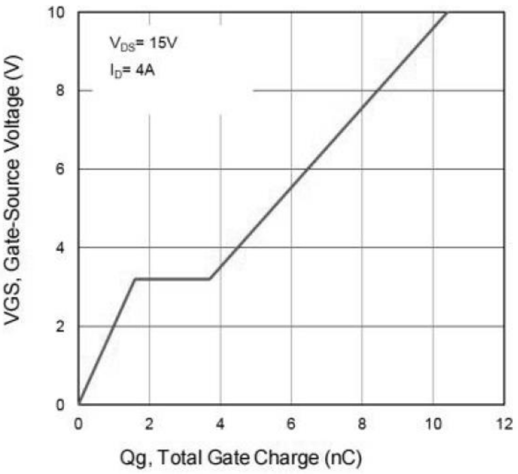


Figure 8. Gate Charge Vs. Gate-Source Voltage

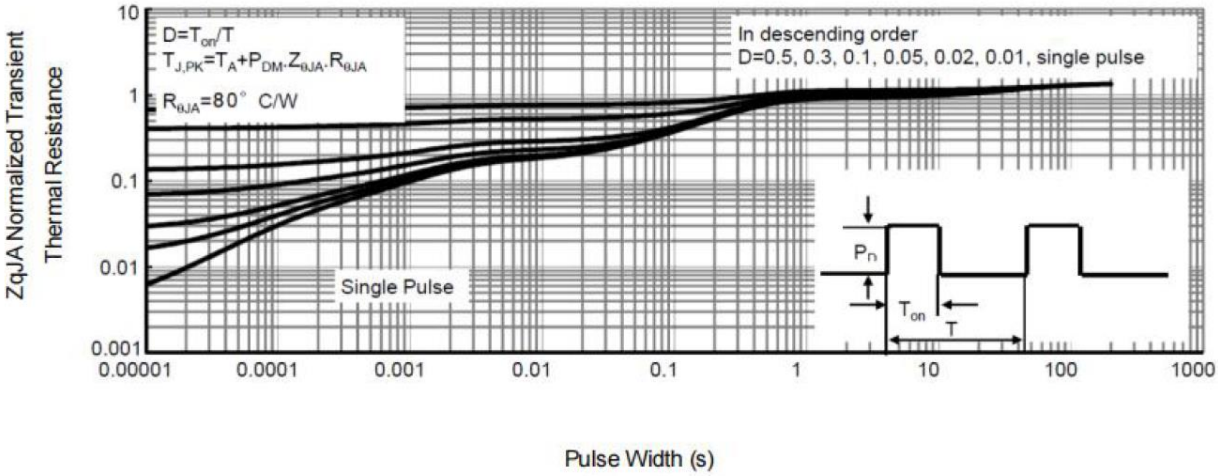


Figure 9. Normalized Maximum Transient Thermal Impedance

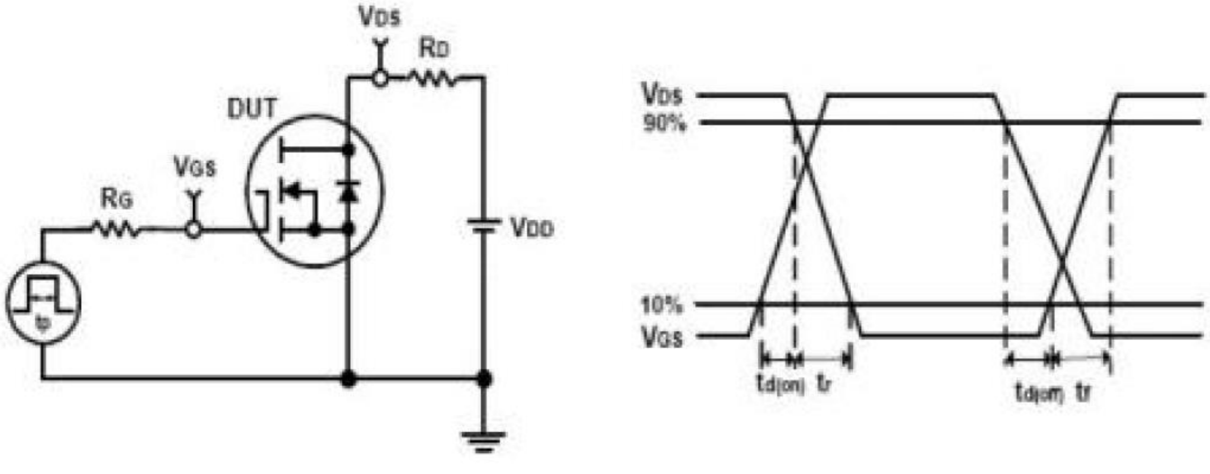


Figure 10. Switching Time Test Circuit and Waveforms

Typical Performance Characteristics- P-Channel

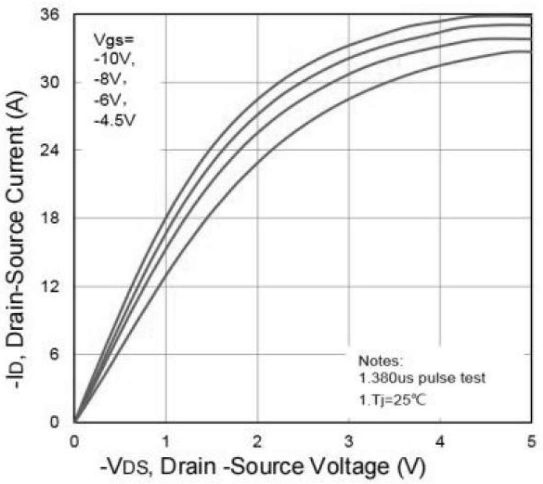


Figure 1 Output Characteristics

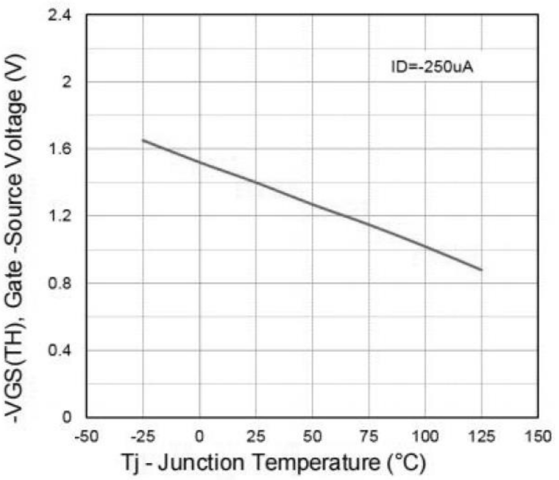


Figure 2. Normalized Threshold Voltage Vs. Temp.

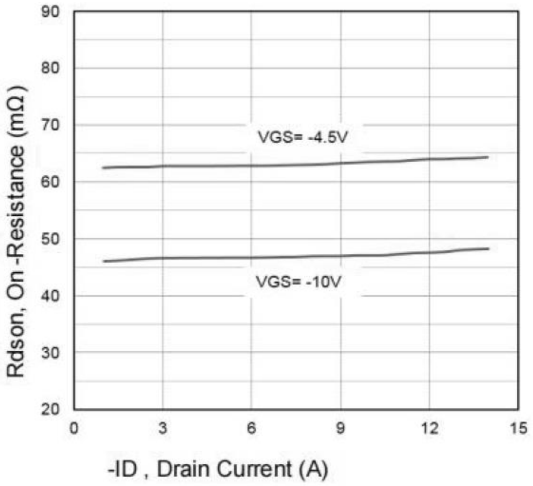


Figure 3. On-Resistance vs. Drain Current and Gate

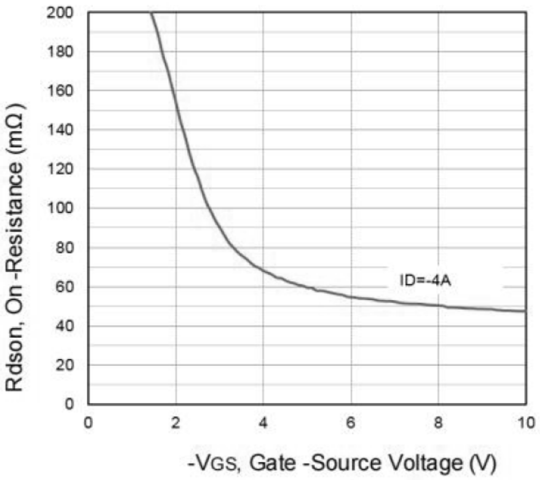


Figure 4. On-Resistance vs.Gate Source Voltage

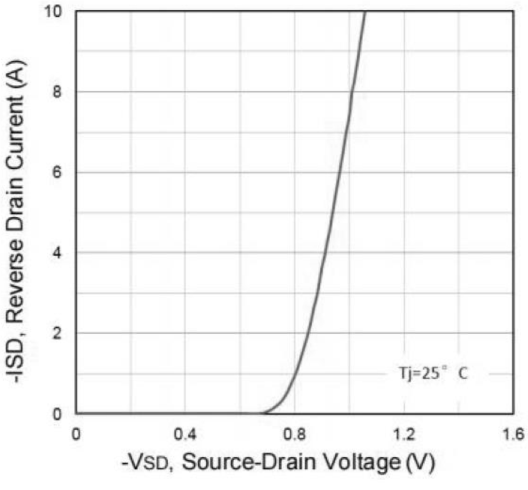


Figure 5. Source-Drain Diode Forward Voltage

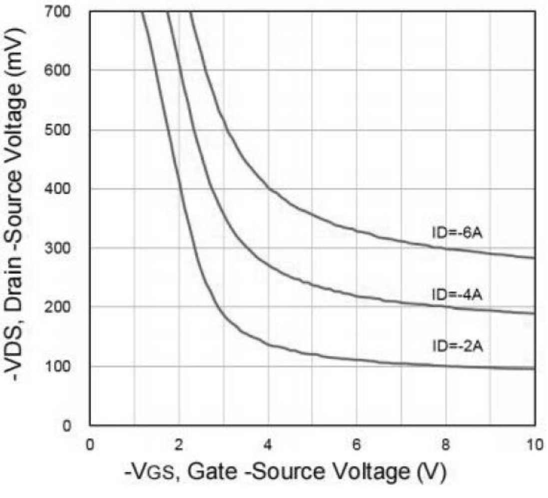


Figure 6. Drain-Source Voltage vs Gate-Source Voltage

Typical Performance Characteristics- P-Channel

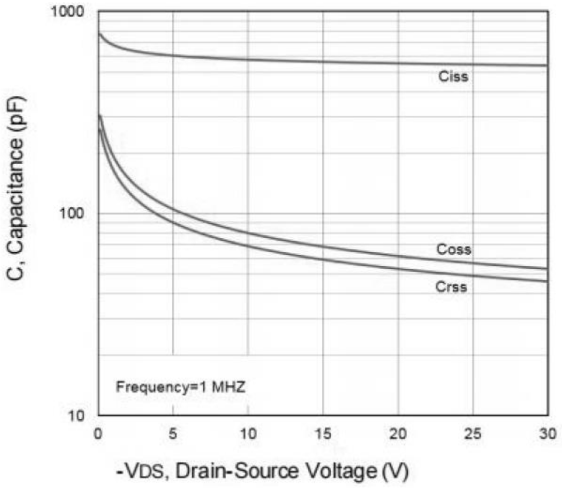


Figure 7. Capacitance Vs. Drain-Source Voltage

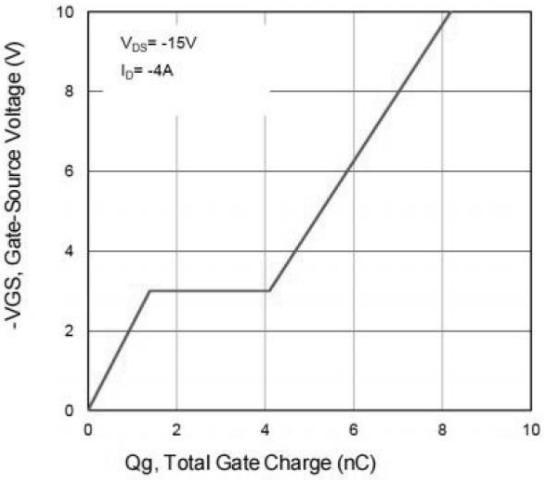


Figure 8. Gate Charge Vs. Gate-Source Voltage

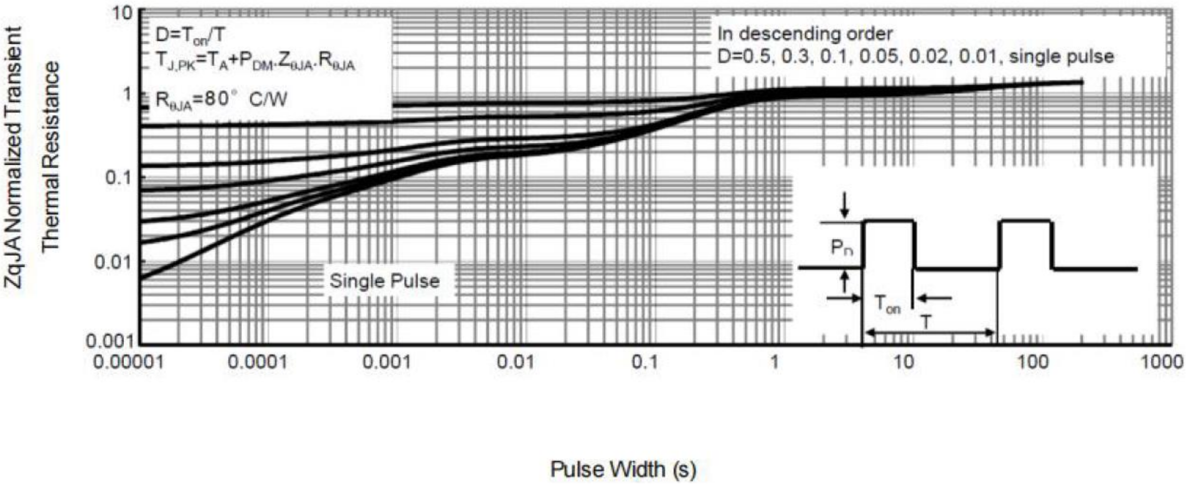


Figure 9. Normalized Maximum Transient Thermal Impedance

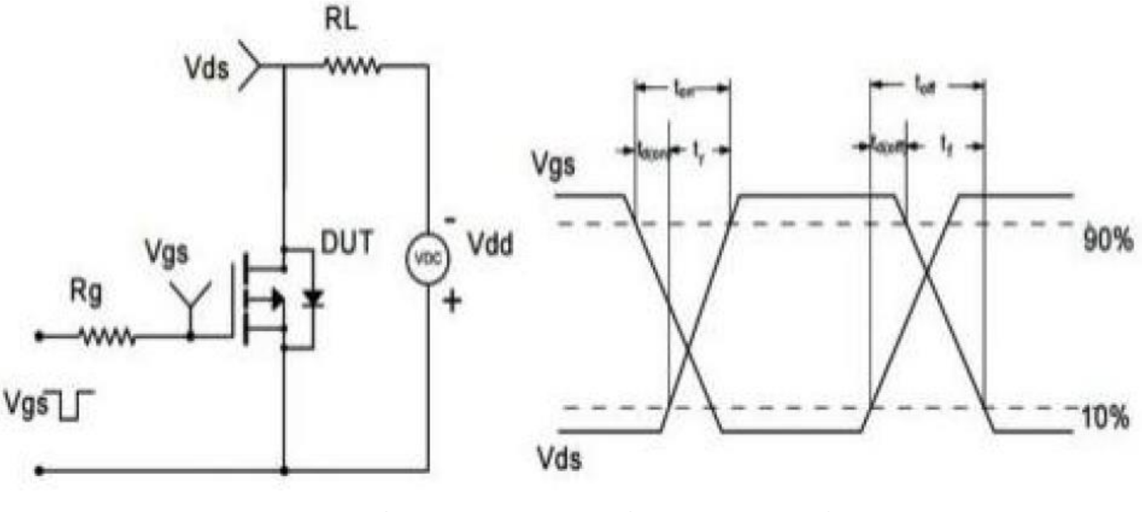
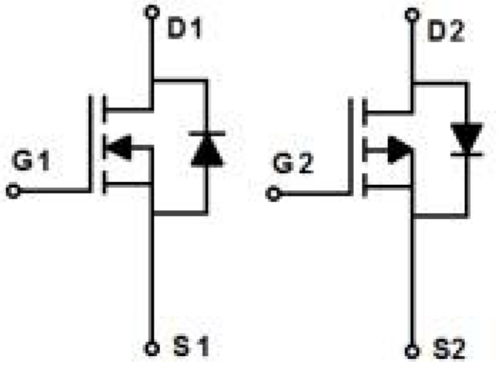
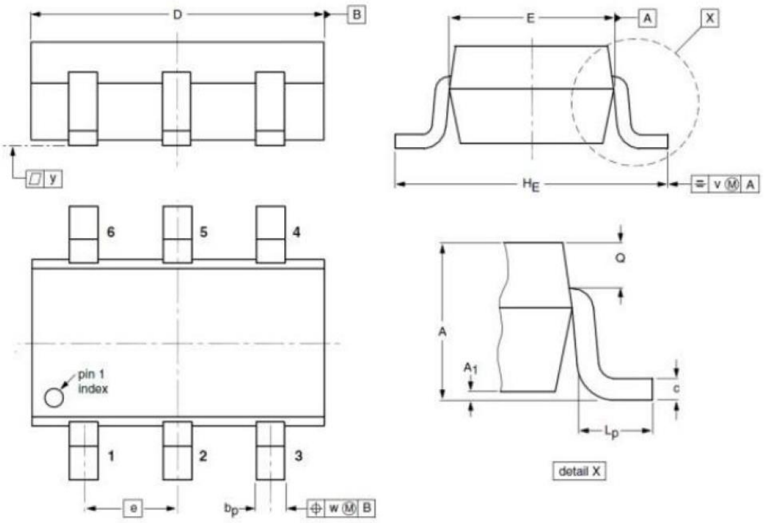


Figure 10. Switching Time Test Circuit and Waveforms

·Circuit diagram



·Package outlines : Dimensions in (mm)



Symbol	Min.	Max.
A	0.90	1.25
A1	0.01	0.10
bp	0.25	0.40
c	0.10	0.26
D	2.70	3.10
E	1.30	1.70
e	0.95 TYP	
HE	2.50	3.00
Lp	0.20	0.60
Q	0.23	0.33
v	0.20 TYP	
w	0.20 TYP	
y	0.10 TYP	

Notice

MOSPEC reserves the rights to make changes of the content herein the document anytime without notification. MOSPEC or anyone on its behalf, assumes no responsibility or liability for any errors or inaccuracies. Please refer to MOSPEC website for the last document.

MOSPEC disclaims any and all liability arising out of the application or use of any product including damages incidentally and consequentially incurred.

Application shown on the herein document are examples of standard use and operation. Customers are responsible for comprehending suitable use in particular applications. MOSPEC makes no representation or warranty that such application will be suitable for the specified use without further testing or modification.

The information contained herein is presented only as a guide for the applications of our products. No responsibility is assumed by MOSPEC for any infringements of patents or other rights of the third parties which may result from its use. No license is granted by implication or otherwise under any patent or patent rights of MOSPEC or others.

These MOSPEC products are intended for usage in general electronic equipment. Please make sure to consult with MOSPEC before you use these MOSPEC products in equipment which require specialized quality and/or reliability, and in equipment which could have major impact to the welfare of human life (atomic energy control, aeronautics , traffic control, combustion control, safety devices etc.)