SamHop Microelectronics Corp.

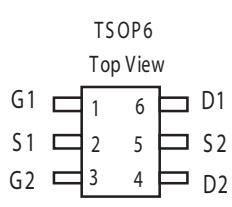
STS2620

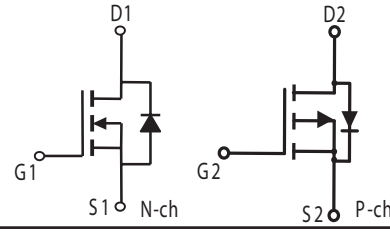
Feb,25 2005 Ver1.1

Dual Enhancement Mode Field Effect Transistor (N and P Channel)

PRODUCT SUMMARY (N-Channel)		
V_{DSS}	I_D	$R_{DS(ON)}$ (mΩ) Max
20V	2.5A	80 @ V_{GS} = 4.5V
		110 @ V_{GS} = 2.5V

PRODUCT SUMMARY (P-Channel)		
V_{DSS}	I_D	$R_{DS(ON)}$ (mΩ) Max
-20V	-2A	130 @ V_{GS} = -4.5V
		190 @ V_{GS} = -2.5V





ABSOLUTE MAXIMUM RATINGS (T_A=25°C unless otherwise noted)

Parameter	Symbol	N-Channel	P-Channel	Unit
Drain-Source Voltage	V_{DS}	20	-20	V
Gate-Source Voltage	V_{GS}	±10	±10	V
Drain Current-Continuous [a] @ Tc=25°C	I_D	2.5	-2	A
-Pulsed [b]	I_{DM}	8	-7	A
Drain-Source Diode Forward Current [a]	I_S	1.25	-1.25	A
Maximum Power Dissipation [a]	P_D	1.0		W
Operating Junction and Storage Temperature Range	T_J, T_{STG}	-55 to 150		°C

THERMAL CHARACTERISTICS

Thermal Resistance, Junction-to-Ambient [a]	$R_{\theta JA}$	125	°C/W

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N-Channel ELECTRICAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)

Parameter	Symbol	Condition	Min	Typ [c]	Max	Unit
OFF CHARACTERISTICS						
Drain-Source Breakdown Voltage	BV_{DSS}	V_{GS}=0V, I_D=250uA	20			V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS}=16V, V_{GS}=0V			1	uA
Gate-Body Leakage	I_{GSS}	V_{GS}=± 10V, V_{DS}=0V			±100	nA
ON CHARACTERISTICS [b]						
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS}=V_{GS}, I_D=250uA	0.5	0.8	1.5	V
Drain-Source On-State Resistance	$R_{DS(ON)}$	V_{GS}=4.5V, I_D=2.5A		65	80	m-ohm
		V_{GS}=2.5V, I_D=2A		90	110	m-ohm
On-State Drain Current	$I_{D(ON)}$	V_{DS}=5V, V_{GS}=4.5V	6			A
Forward Transconductance	g_{FS}	V_{DS}=5V, I_D=2.5A		7		S
DYNAMIC CHARACTERISTICS [c]						
Input Capacitance	C_{ISS}	V_{DS}=10V, V_{GS}=0V f=1.0MHz		223		pF
Output Capacitance	C_{OSS}			68		pF
Reverse Transfer Capacitance	C_{RSS}			53		pF
SWITCHING CHARACTERISTICS [c]						
Turn-On Delay Time	$t_{D(ON)}$	V_{DD}=10V, I_D=1A, V_{GS}=4.5V, R_{GEN}=6 ohm		10.5		ns
Rise Time	t_r			9.8		ns
Turn-Off Delay Time	$t_{D(OFF)}$			15.2		ns
Fall Time	t_f			11.8		ns
Total Gate Charge	Q_g	V_{DS}=10V, I_D=2.5A, V_{GS}=4.5V		3.9		nC
Gate-Source Charge	Q_{gs}			1.3		nC
Gate-Drain Charge	Q_{gd}			0.8		nC

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P-Channel ELECTRICAL CHARACTERISTICS (T_A=25°C unless otherwise noted)

Parameter	Symbol	Condition	Min	Typ [c]	Max	Unit
OFF CHARACTERISTICS						
Drain-Source Breakdown Voltage	BV_{DSS}	V_{GS}=0V, I_D=-250uA	-20			V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS}=-16V, V_{GS}=0V			1	uA
Gate-Body Leakage	I_{GSS}	V_{GS}=± 10V, V_{DS}=0V			±100	nA
ON CHARACTERISTICS [b]						
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS}=V_{GS}, I_D=-250uA	-0.5	-0.8	-1.5	V
Drain-Source On-State Resistance	$R_{DS(ON)}$	V_{GS}=-4.5V, I_D= -2.0A		115	130	m-ohm
		V_{GS}= -2.5V, I_D= -1.0A		175	190	m-ohm
On-State Drain Current	$I_{D(ON)}$	V_{DS}= -5V, V_{GS}= -4.5V	-5			A
Forward Transconductance	g_{FS}	V_{DS}= -5V, I_D=-2.0A		6		S
DYNAMIC CHARACTERISTICS [c]						
Input Capacitance	C_{ISS}	V_{DS}= -20V, V_{GS}= 0V f=1.0MHz		293		pF
Output Capacitance	C_{OSS}			65		pF
Reverse Transfer Capacitance	C_{RSS}			50		pF
SWITCHING CHARACTERISTICS [c]						
Turn-On Delay Time	$t_{D(ON)}$	V_{DD}= -10V, I_D= -1A, V_{GS}= -4.5V, R_{GEN}= 6 ohm		12.6		ns
Rise Time	t_r			13.7		ns
Turn-Off Delay Time	$t_{D(OFF)}$			81.5		ns
Fall Time	t_f			42.1		ns
Total Gate Charge	Q_g	V_{DS}= -10V, I_D= -2A, V_{GS}= -4.5V		3.4		nC
Gate-Source Charge	Q_{gs}			0.8		nC
Gate-Drain Charge	Q_{gd}			1		nC

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ELECTRICAL CHARACTERISTICS (T_A=25°C unless otherwise noted)

Parameter	Symbol	Condition		Min	Typ [c]	Max	Unit
DRAIN-SOURCE DIODE CHARACTERISTICS [b]							
Diode Forward Voltage	V_{SD}	V_{GS} = 0V, Is =1.25A	N-Ch		0.84	1.2	V
		V_{GS} = 0V, Is =-1.25A	P-Ch		-0.85	-1.2	

Notes

a.Surface Mounted on FR4 Board, t≤10sec.
b.Pulse Test:Pulse Width≤300 μs, Duty Cycle≤2%.
c.Guaranteed by design, not subject to production testing.
N-Channel

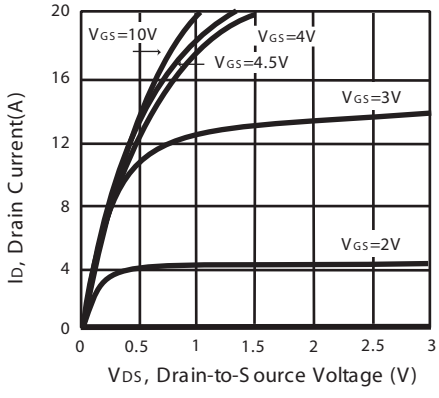

Figure 1. Output Characteristics

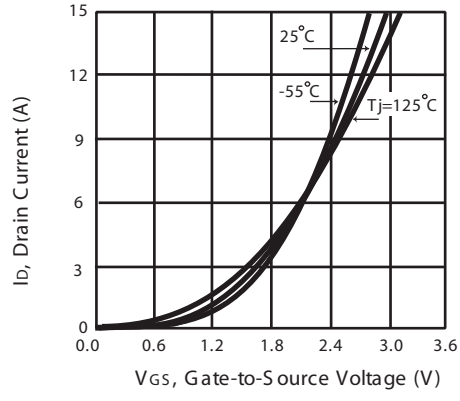

Figure 2. Transfer Characteristics

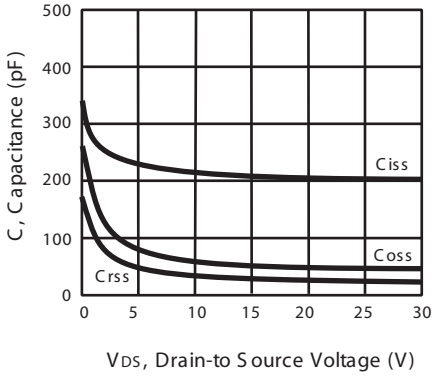

Figure 3. Capacitance

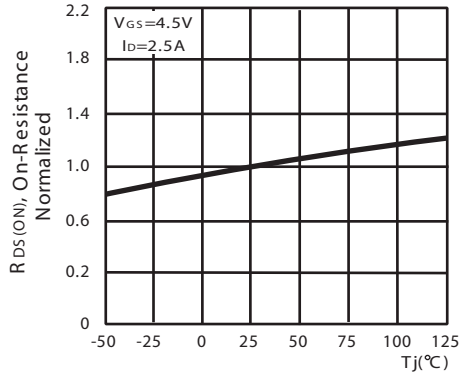

Figure 4. On-Resistance Variation with Temperature

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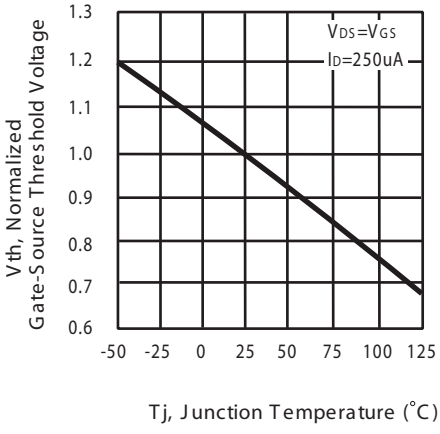
N-Channel



with Temperature

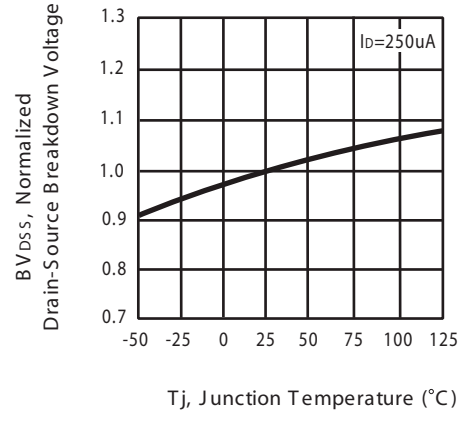


Figure 6. Breakdown Voltage Variation with Temperature

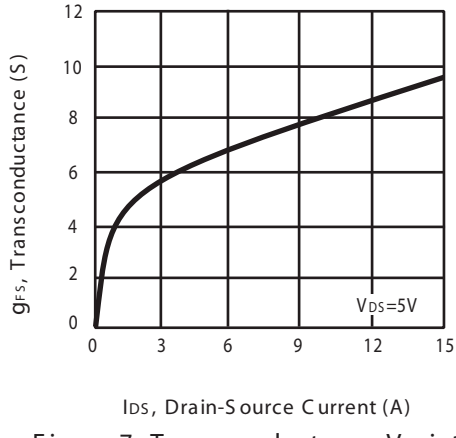


Figure 7. Transconductance Variation with Drain Current

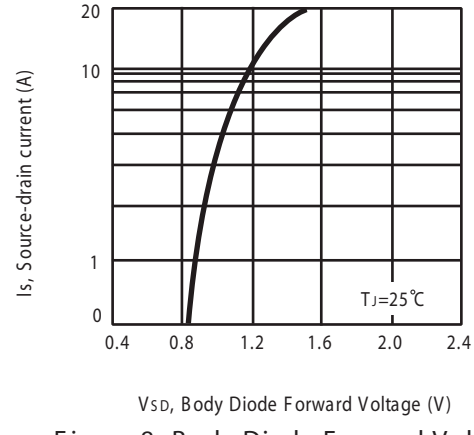


Figure 8. Body Diode Forward Voltage Variation with Source Current

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P-Channel

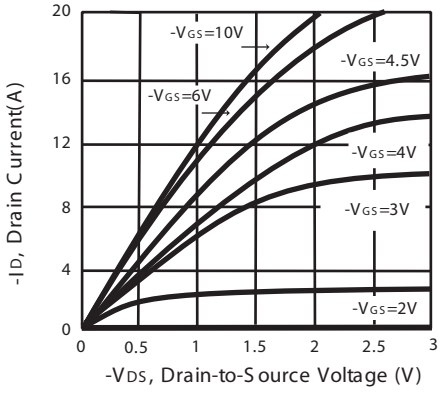


Figure 1. Output Characteristics

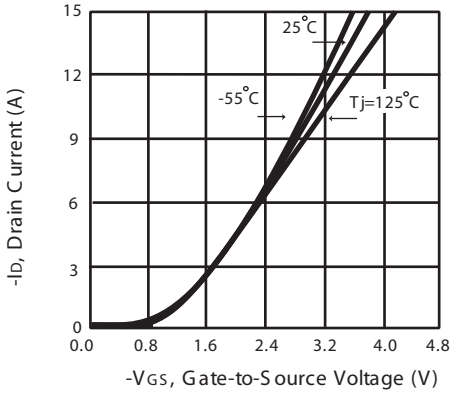


Figure 2. Transfer Characteristics

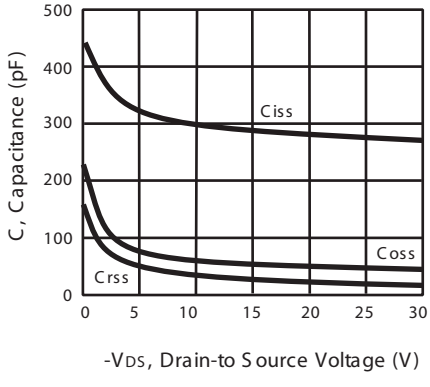


Figure 3. Capacitance

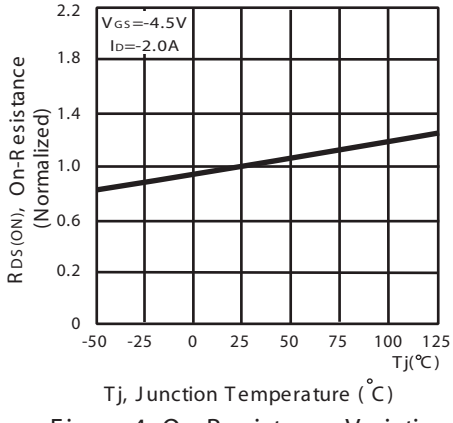
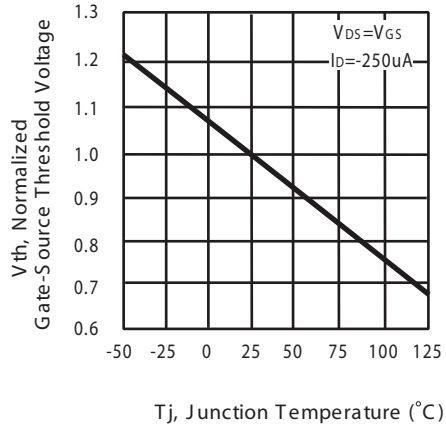


Figure 4. On-Resistance Variation with Temperature

P-Channel



with Temperature

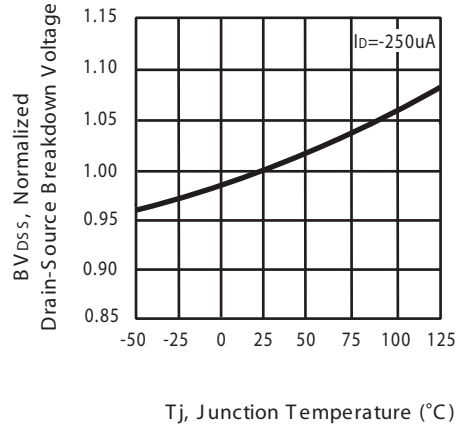


Figure 6. Breakdown Voltage Variation with Temperature

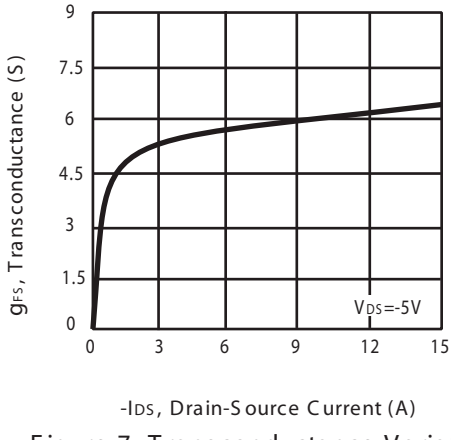


Figure 7. Transconductance Variation with Drain Current

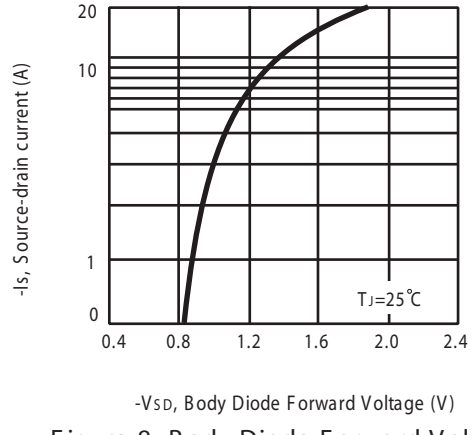


Figure 8. Body Diode Forward Voltage Variation with Source Current

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N-Channel

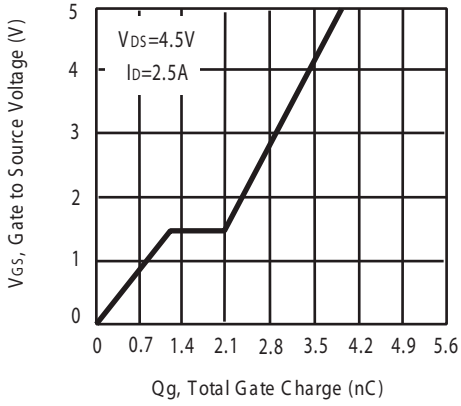


Figure 9. Gate Charge

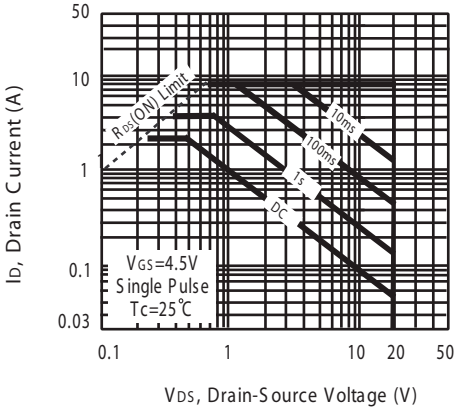
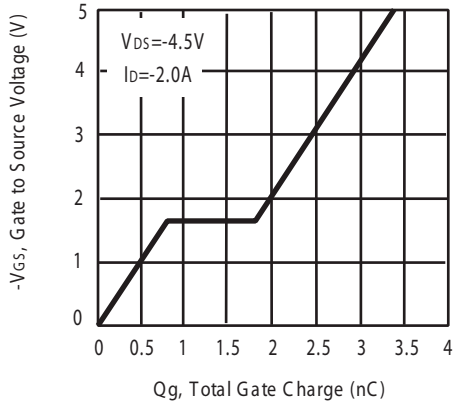


Figure 10. Maximum Safe Operating Area

P-Channel



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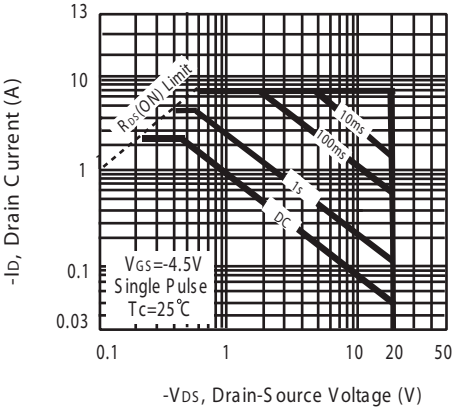

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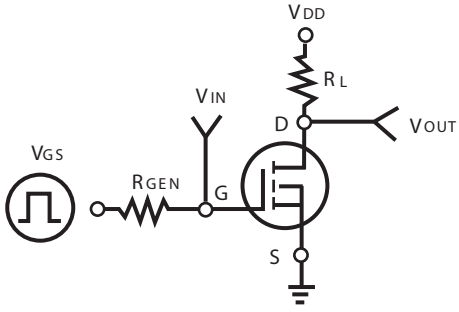


Figure 11. Switching Test Circuit

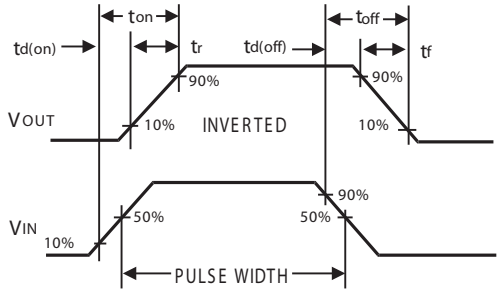
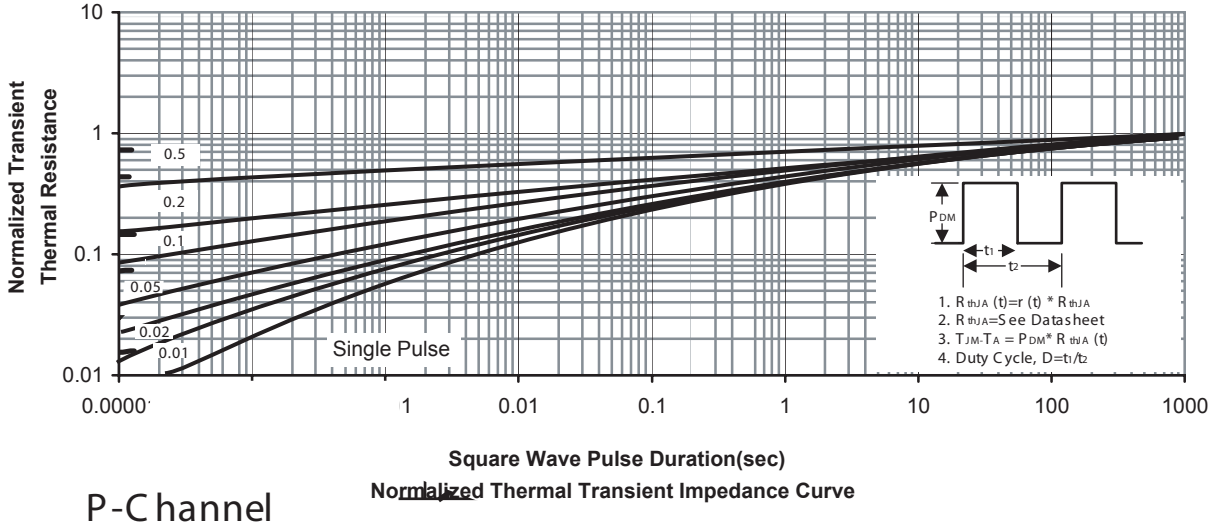


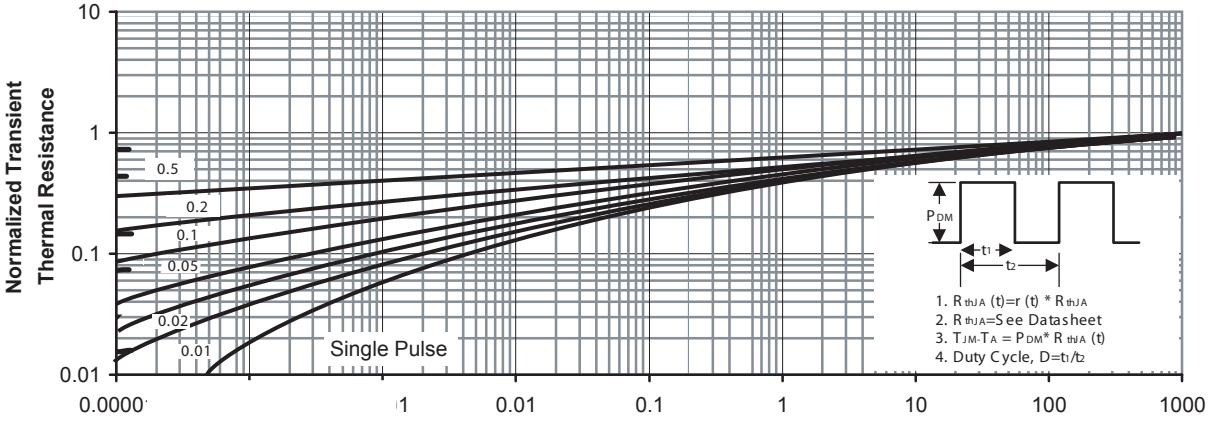
Figure 12. Switching Waveforms

N-Channel



Normalized Thermal Transient Impedance Curve

P-Channel



Normalized Thermal Transient Impedance Curve

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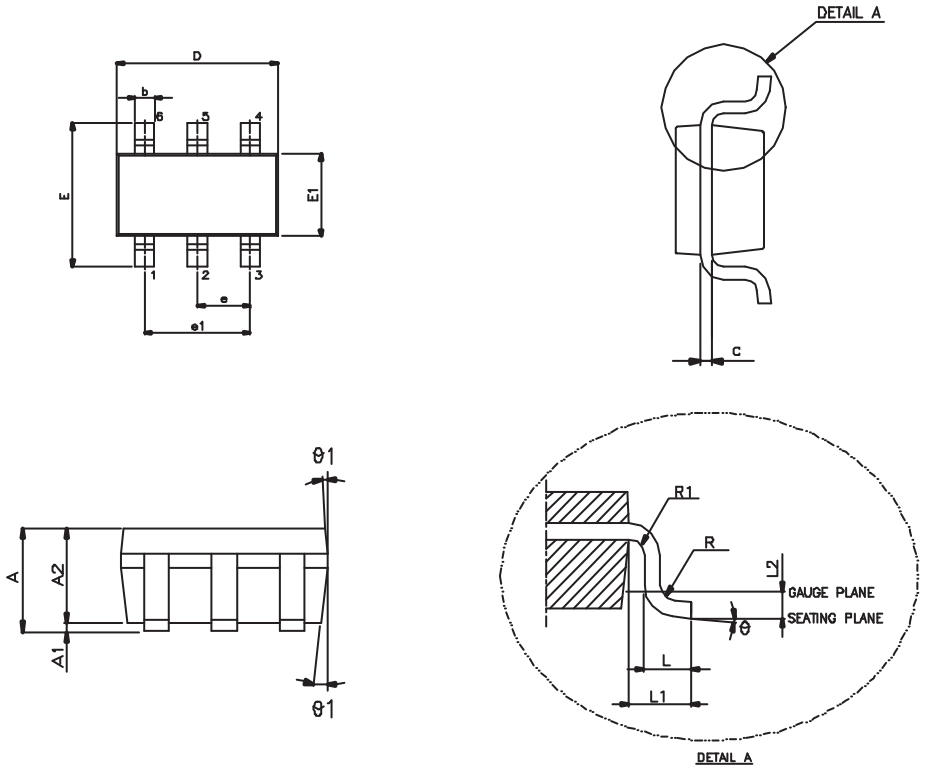
PACKAGE OUTLINE DIMENSIONS

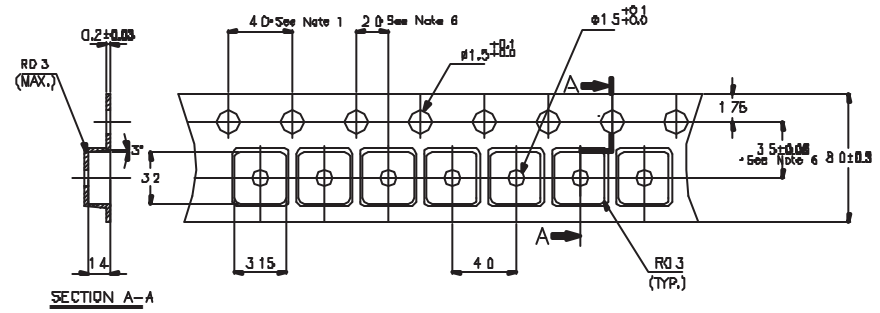
TSOP6



SYMBOL	MIN.	NOM.	MAX.
A	–	–	1.45
A1	–	–	0.15
A2	0.90	1.15	1.30
b	0.30	–	0.50
c	0.08	–	0.22
D		2.90 BSC.	
E		2.80 BSC.	
E1		1.60 BSC.	
e		0.95 BSC	
e1		1.90 BSC.	
L	0.30	0.45	0.60
L1		0.60 REF.	
L2		0.25 BSC.	
R	0 10	–	–
R1	0 10	–	0.25
θ	0°	4°	8°
θ1	5°	10°	15°

TSOP6 Tape and Reel Data

TSOP6 Carrier Tape



TSOP6 Reel