

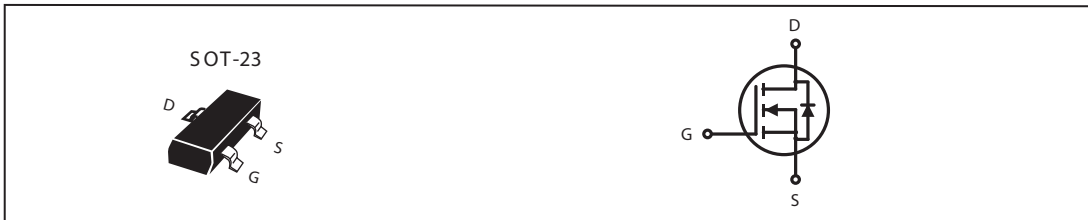


N-Channel Enhancement Mode Field Effect Transistor

PRODUCT SUMMARY		
V _{DSS}	I _D	R _{DS(ON)} (mΩ) Max
40V	3.5A	62 @ V _{GS} = 10V
		80 @ V _{GS} = 4.5V

FEATURES

- Super high dense cell design for low R_{DS(ON)}.
- Rugged and reliable.
- SOT-23 package.



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

Parameter	Symbol	Limit	Unit	
Drain-Source Voltage	V _{DS}	40	V	
Gate-Source Voltage	V _{GS}	±20	V	
Drain Current-Continuous @ T _a	I _D	25°C	3.5	A
		70°C	2.7	A
-Pulsed ^a	I _{DM}	15	A	
Drain-Source Diode Forward Current	I _S	1.25	A	
Maximum Power Dissipation	P _D	T _a =25°C	1.25	W
		T _a =70°C	0.76	
Operating Junction and Storage Temperature Range	T _J , T _{STG}	-55 to 150	°C	

THERMAL CHARACTERISTICS

Thermal Resistance, Junction-to-Ambient ^a	R _{θJA}	100	°C/W
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ELECTRICAL CHARACTERISTICS ($T_A = 25^\circ\text{C}$ unless otherwise noted)

Parameter	Symbol	Condition	Min	Typ ^c	Max	Unit
OFF CHARACTERISTICS						
Drain-Source Breakdown Voltage	BV_{DS}	$V_{GS} = 0V, I_D = 250\mu A$	40			V
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS} = 32V, V_{GS} = 0V$			1	μA
Gate-Body Leakage	I_{GSS}	$V_{GS} = \pm 20V, V_{DS} = 0V$			± 100	nA
ON CHARACTERISTICS^b						
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = 250\mu A$	1	1.6	3.0	V
Drain-Source On-State Resistance	$R_{DS(on)}$	$V_{GS} = 10V, I_D = 3.5A$		54	62	m-ohm
		$V_{GS} = 4.5V, I_D = 2.8A$		68	80	m-ohm
On-State Drain Current	$I_{D(on)}$	$V_{DS} = 5V, V_{GS} = 4.5V$	10			A
Forward Transconductance	g_{FS}	$V_{DS} = 5V, I_D = 3.5A$		9		S
DYNAMIC CHARACTERISTICS^c						
Input Capacitance	C_{ISS}	$V_{DS} = 15V, V_{GS} = 0V$ $f = 1.0MHz$		320		pF
Output Capacitance	C_{OSS}			55		pF
Reverse Transfer Capacitance	C_{RSS}			32		pF
SWITCHING CHARACTERISTICS^c						
Turn-On Delay Time	$t_{D(on)}$	$V_{DD} = 15V,$ $I_D = 1A,$ $V_{GS} = 10V,$ $R_L = 15\text{ ohm}$ $R_{GEN} = 6\text{ ohm}$		6.6		ns
Rise Time	t_r			3.9		ns
Turn-Off Delay Time	$t_{D(off)}$			15.7		ns
Fall Time	t_f			3.3		ns
Total Gate Charge	Q_g	$V_{DS} = 15V, I_D = 3.5A,$ $V_{GS} = 10V$		6		nC
Gate-Source Charge	Q_{gs}			0.8		nC
Gate-Drain Charge	Q_{gd}			1.5		nC

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ELECTRICAL CHARACTERISTICS ($T_c=25^\circ\text{C}$ unless otherwise noted)

Parameter	Symbol	Condition	Min	Typ	Max	Unit
DRAIN-SOURCE DIODE CHARACTERISTICS ^a						
Diode Forward Voltage	V_{SD}	$V_{GS} = 0V, I_s = 1.25A$		0.82	1.3	V

Notes

a. Pulse Test: Pulse Width $\leq 300\mu s$, Duty Cycle $\leq 2\%$.

b. Guaranteed by design, not subject to production testing.

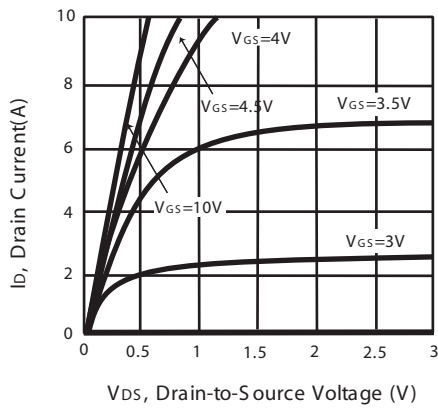


Figure 1. Output Characteristics

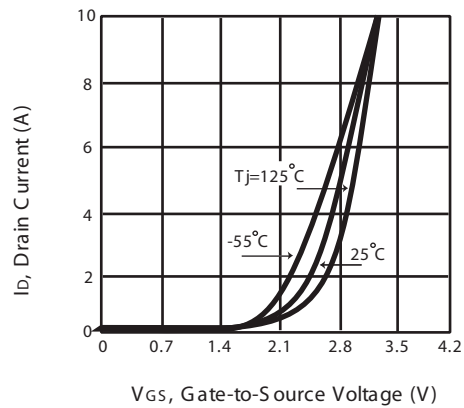


Figure 2. Transfer Characteristics

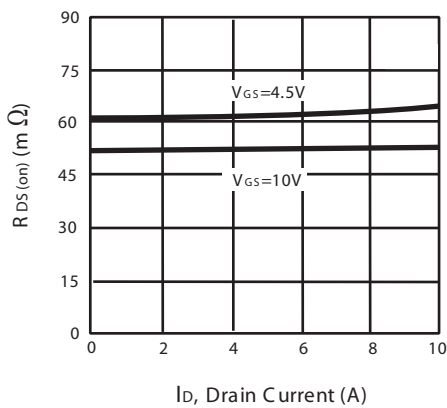


Figure 3. On-Resistance vs. Drain Current and Gate Voltage

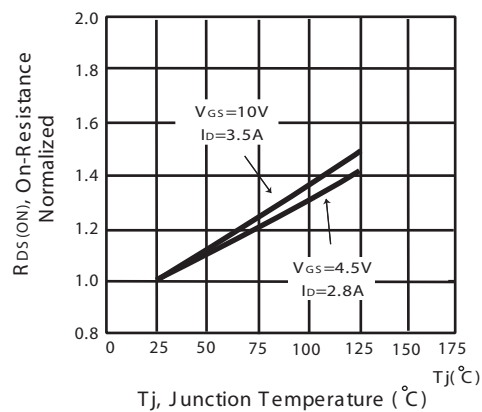


Figure 4. On-Resistance Variation with Drain Current and Temperature

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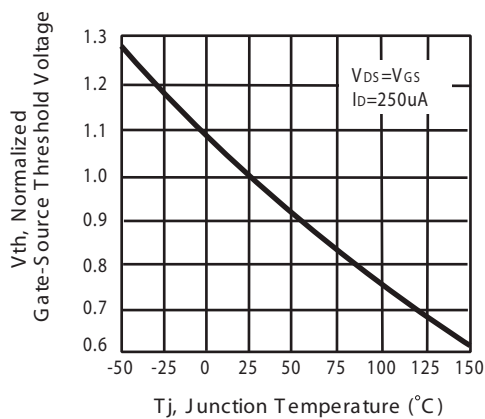


Figure 5. Gate Threshold Variation with Temperature

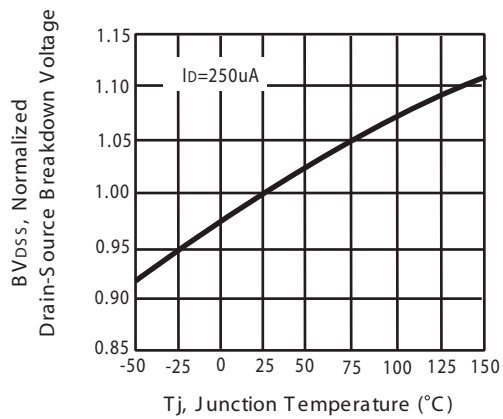


Figure 6. Breakdown Voltage Variation with Temperature

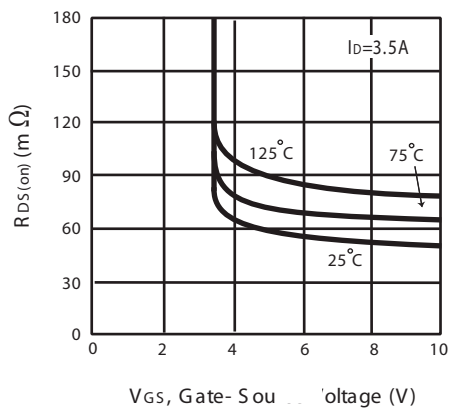


Figure 7. On-Resistance vs. Gate-Source Voltage

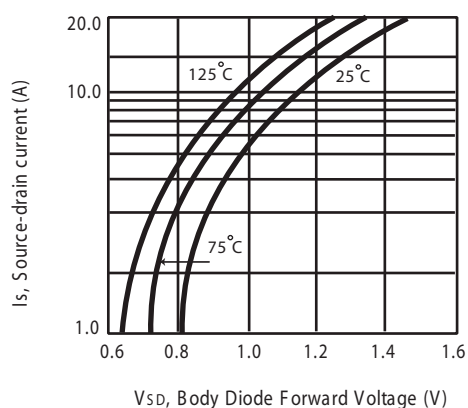
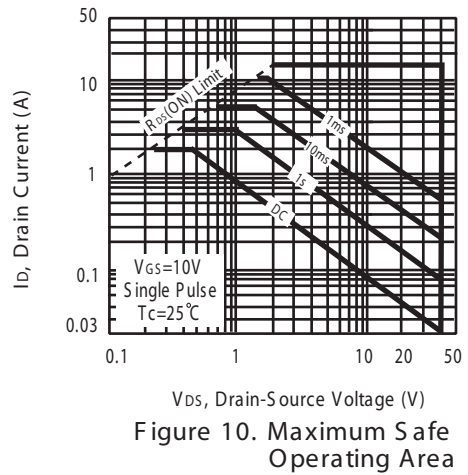
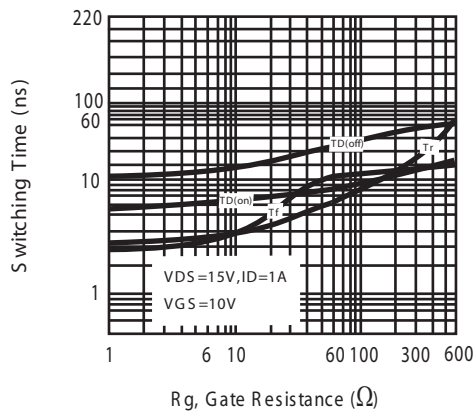
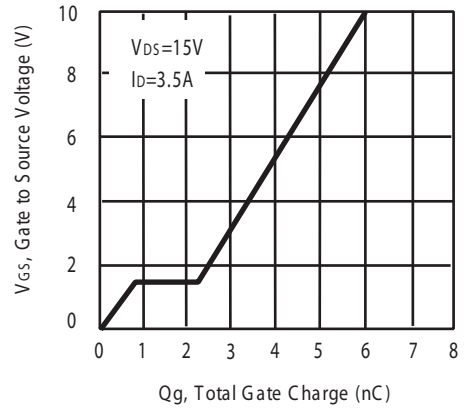
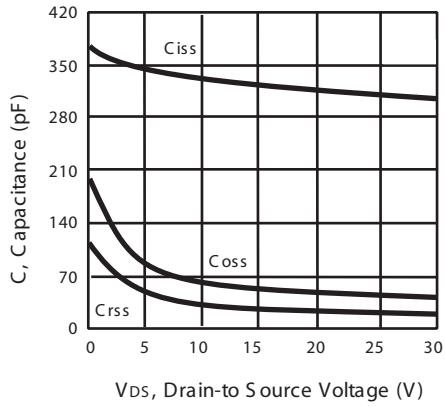


Figure 8. Body Diode Forward Voltage Variation with Source Current

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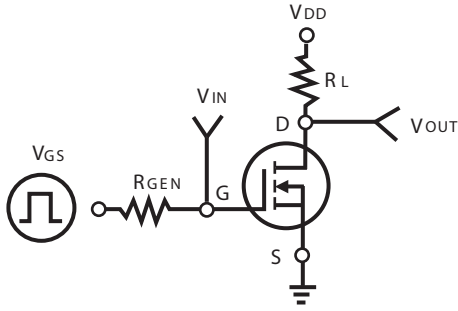


Figure 11. S Switching Test Circuit

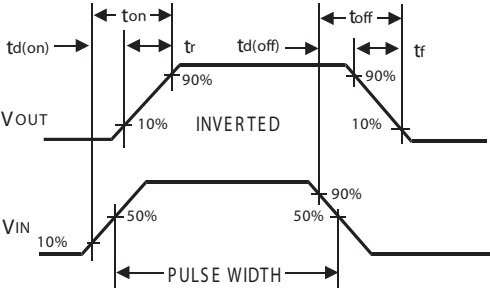
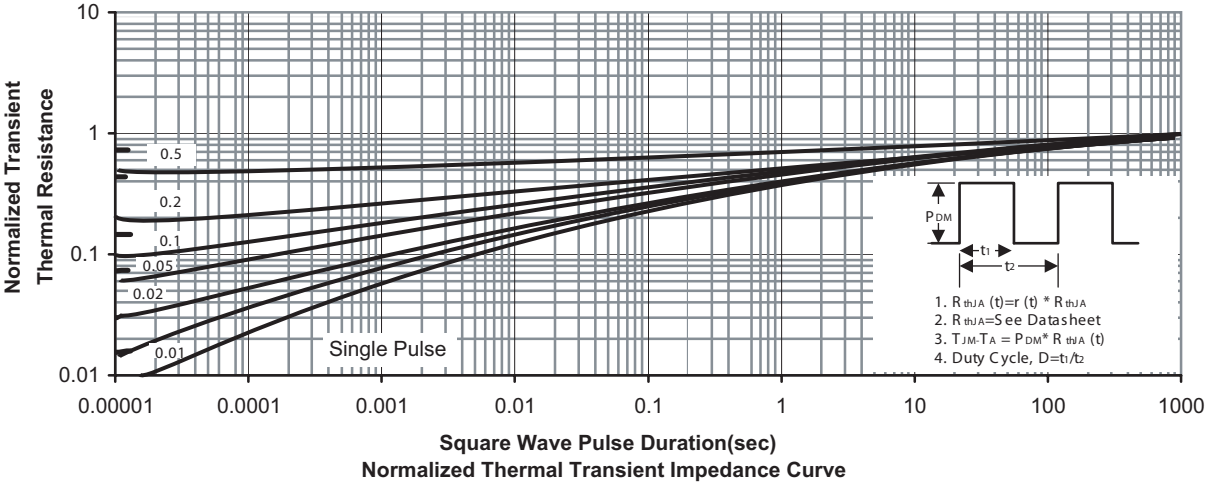


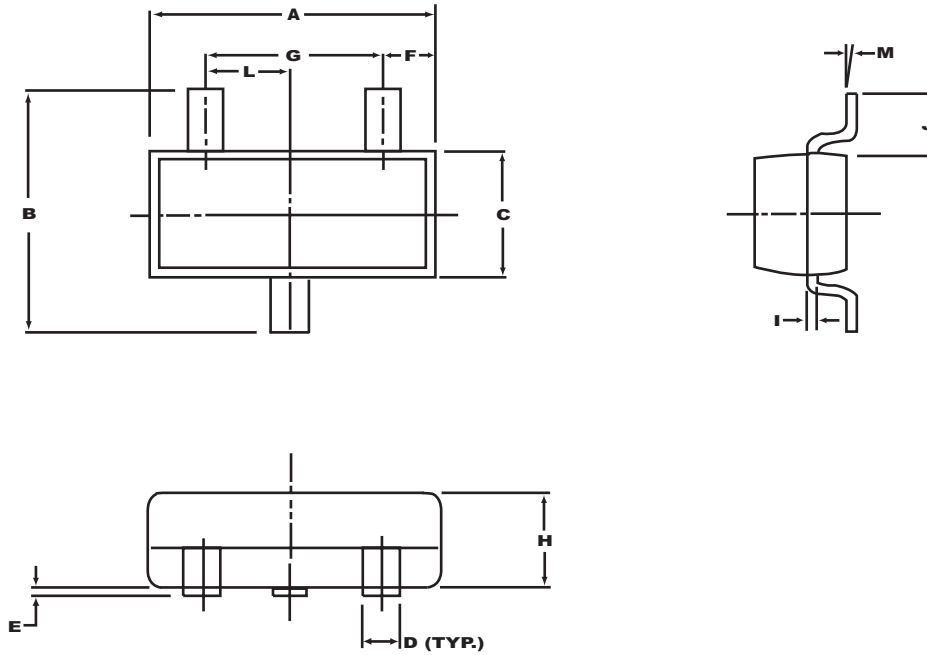
Figure 12. S Switching Waveforms



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PACKAGE OUTLINE DIMENSIONS

SOT-23

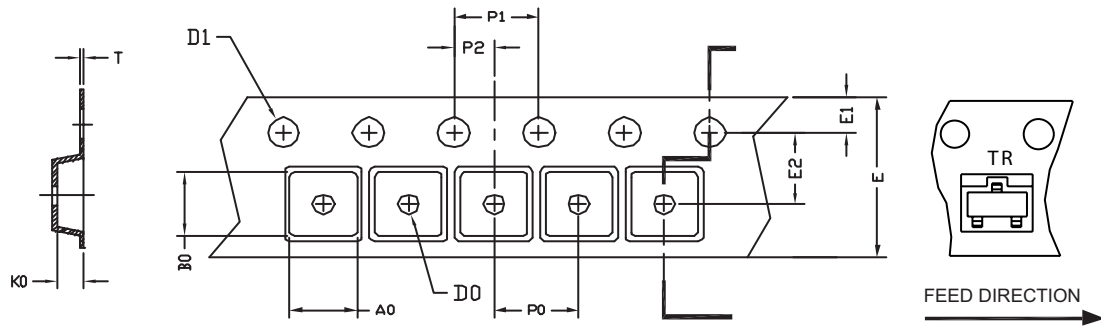


SYMBOLS	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	2.70	3.10	0.106	0.122
B	2.40	2.80	0.094	0.110
C	1.40	1.60	0.055	0.063
D	0.35	0.50	0.014	0.020
E	0	0.10	0	0.004
F	0.45	0.55	0.018	0.022
G	1.90 REF.		0.075 REF.	
H	1.00	1.30	0.039	0.051
I	0.10	0.20	0.004	0.008
J	0.40	-	0.016	-
L	0.45	1.15	0.033	0.045
M	0°	10°	0°	10°

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SOT-23 Tape and Reel Data

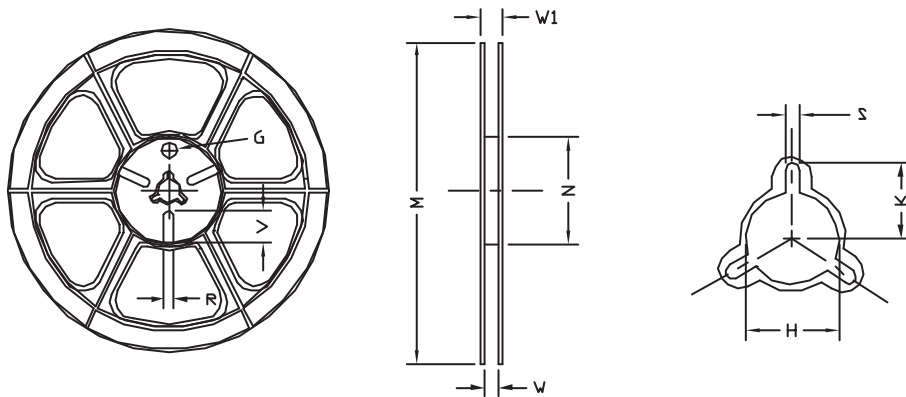
SOT-23 Carrier Tape



UNIT:mm

PACKAGE	A0	B0	K0	D0	D1	E	E1	E2	P0	P1	P2	T
SOT-23	3.20 ± 0.10	3.00 ± 0.10	1.33 ± 0.10	ϕ 1.00 $+0.25$	ϕ 1.50 $+0.10$	8.00 $+0.30$ -0.10	1.75 ± 0.10	3.50 ± 0.05	4.00 ± 0.10	4.00 ± 0.10	2.00 ± 0.05	0.20 ± 0.02

SOT-23 Reel



UNIT:mm

TAPE SIZE	REEL SIZE	M	N	W	W1	H	K	S	G	R	V
8mm	ϕ 178	ϕ 178 ± 1	ϕ 60 ± 1	9.00 ± 0.5	12.00 ± 0.5	ϕ 13.5 ± 0.5	10.5	2.00 ± 0.5	ϕ 10.0	5.00	18.00