



N-Channel Enhancement Mode Field Effect Transistor

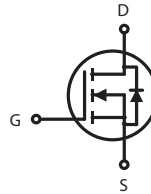
PRODUCT SUMMARY

V_{DS}	I_D	$R_{DS(ON)}$ (m Ω) Max
20V	2.7A	80 @ $V_{GS} = 4.5V$ 110 @ $V_{GS} = 2.5V$

FEATURES

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

SOT-23



ABSOLUTE MAXIMUM RATING ($T_A=25^\circ\text{C}$ unless otherwise noted)

Parameter	Symbol	Limit	Unit
Drain-Source Voltage	V_{DS}	20	V
Gate-Source Voltage	V_{GS}	± 10	V
Drain Current-Continuous ^a @ $T_c=25^\circ\text{C}$ -Pulsed ^b	I_D	2.7	A
	I_{DM}	10	A
Drain-Source Diode Forward Current ^a	I_S	1.25	A
Maximum Power Dissipation ^a	P_D	1.25	W
Operating Junction and Storage Temperature Range	T_J, T_{STG}	-55 to 150	$^\circ\text{C}$

THERMAL CHARACTERISTICS

Thermal Resistance, Junction-to-Ambient ^a	R_{thJA}	100	$^\circ\text{C/W}$
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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 = 2.7A		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 = 2.7A		7		S
DYNAMIC CHARACTERISTICS^c						
Input Capacitance	C _{ISS}	V _{DS} = 10V, V _{GS} = 0V f = 1.0MHz		215		pF
Output Capacitance	C _{OSS}			65		pF
Reverse Transfer Capacitance	C _{RSS}			45		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		7.8		ns
Rise Time	t _r			5.1		ns
Turn-Off Delay Time	t _{D(OFF)}			11.6		ns
Fall Time	t _f			9.3		ns
Total Gate Charge	Q _g	V _{DS} = 10V, I _D = 2.7A, V _{GS} = 4.5V		3.8		nC
Gate-Source Charge	Q _{gs}			1.2		nC
Gate-Drain Charge	Q _{gd}			0.9		nC

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

Parameter	Symbol	Condition	Min	Typ ^c	Max	Unit
DRAIN-SOURCE DIODE CHARACTERISTICS^b						
Diode Forward Voltage	V_{SD}	$V_{GS} = 0V, I_s = 1.25A$		0.84	1.2	V

Notes

- a. Surface Mounted on FR4 Board, $t \leq 10\text{sec}$.
- b. Pulse Test: Pulse Width $\leq 300\mu\text{s}$, Duty Cycle $\leq 2\%$.
- c. Guaranteed by design, not subject to production testing.

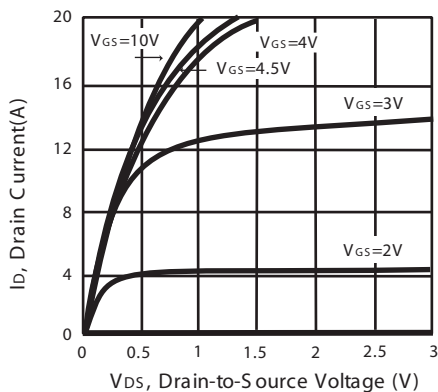


Figure 1. Output Characteristics

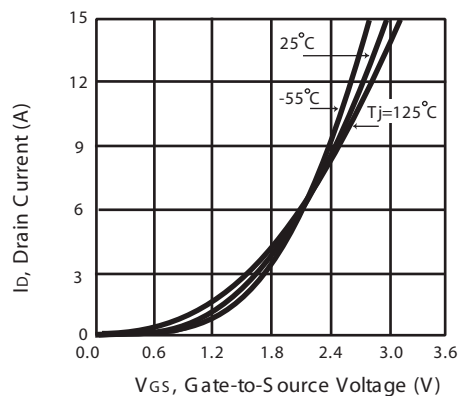


Figure 2. Transfer Characteristics

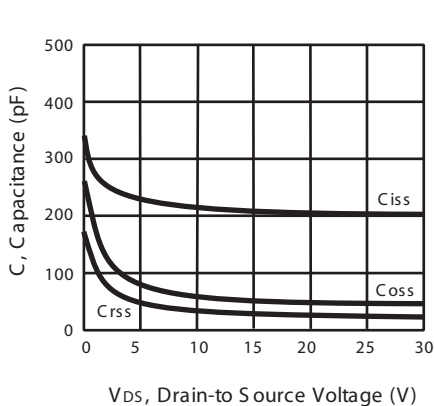


Figure 3. Capacitance

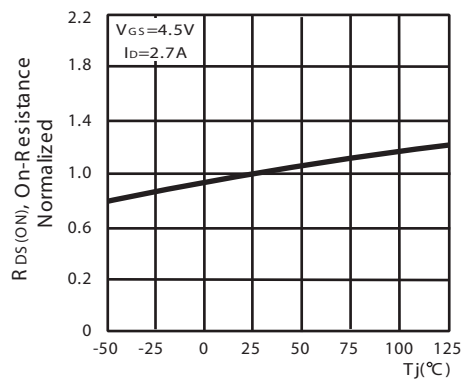
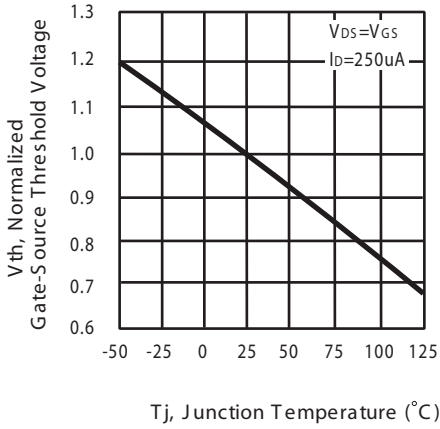


Figure 4. On-Resistance Variation with Temperature

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with Temperature

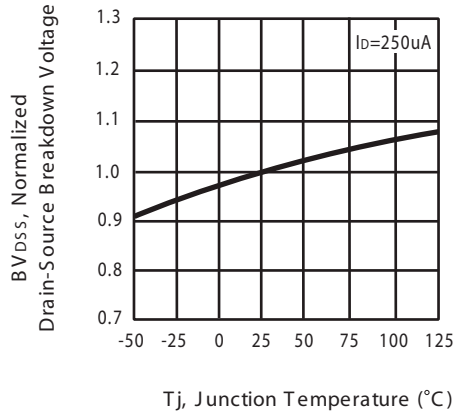


Figure 6. Breakdown Voltage Variation with Temperature

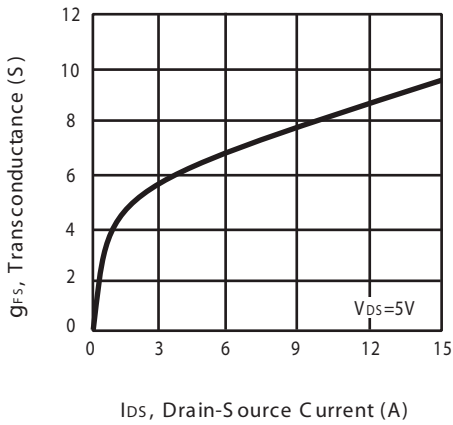


Figure 7. Transconductance Variation with Drain Current

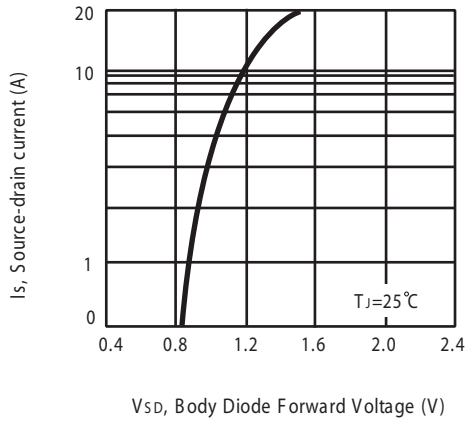


Figure 8. Body Diode Forward Voltage Variation with Source Current

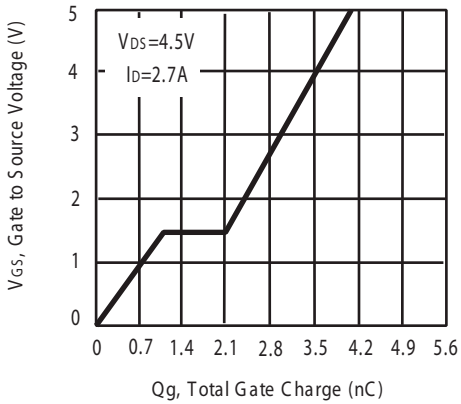


Figure 9. Gate Charge

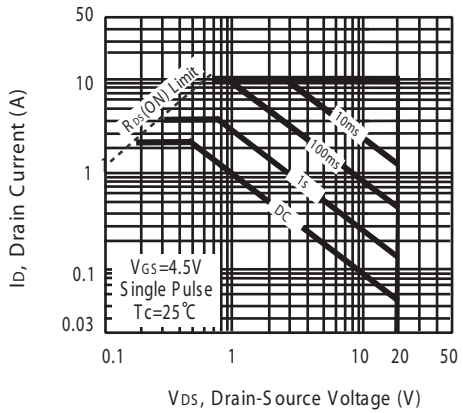


Figure 10. Maximum Safe Operating Area

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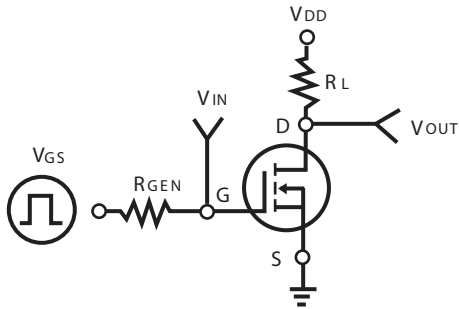


Figure 11. Switching Test Circuit

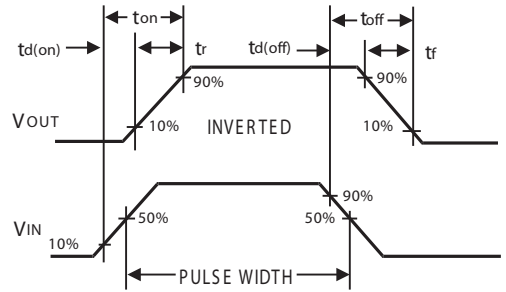
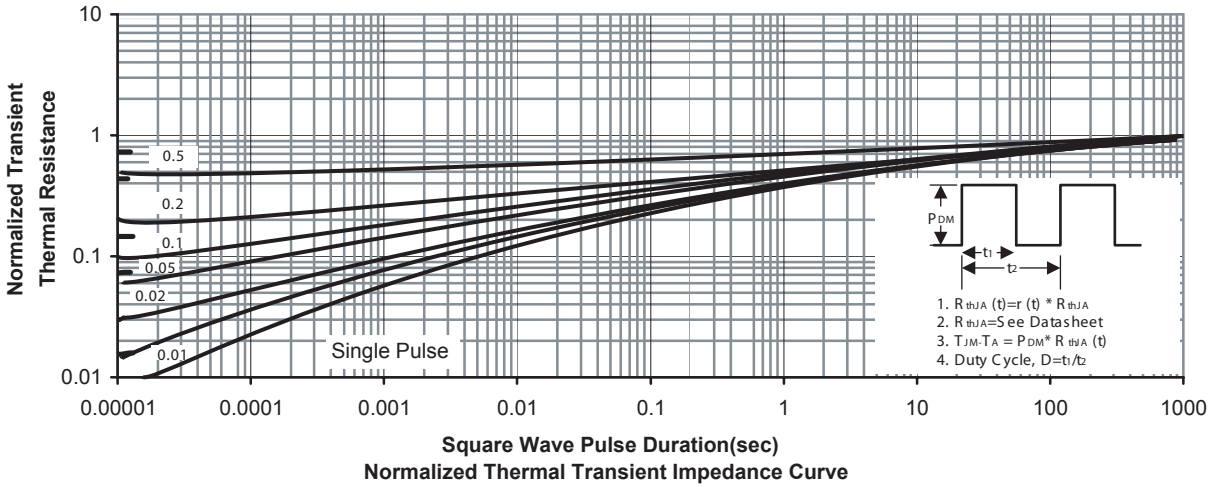


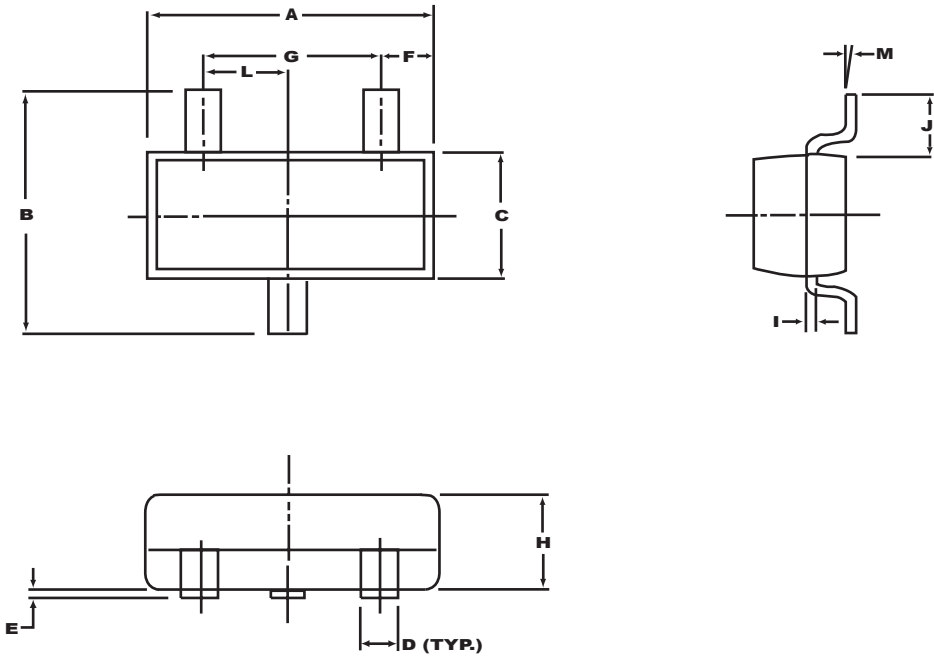
Figure 12. Switching Waveforms



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PACKAGE OUTLINE DIMENSIONS

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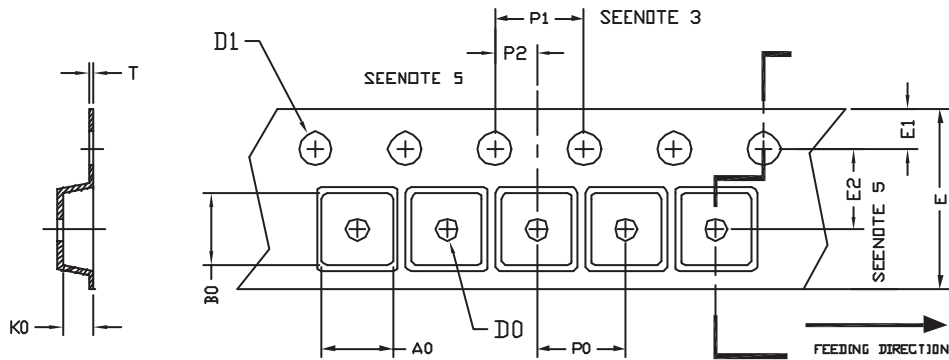


SYMBOLS	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	2.70	3.10	0.106	0.122
B	2.40	2.80	0.094	0.110
C	1.40	1.60	0.055	0.063
D	0.35	0.50	0.014	0.020
E	0	0.10	0	0.004
F	0.45	0.55	0.018	0.022
G	1.90 REF.		0.075 REF.	
H	1.00	1.30	0.039	0.051
I	0.10	0.20	0.004	0.008
J	0.40	-	0.016	-
L	0.45	1.15	0.033	0.045
M	0°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

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SOT-23 Tape and Reel Data

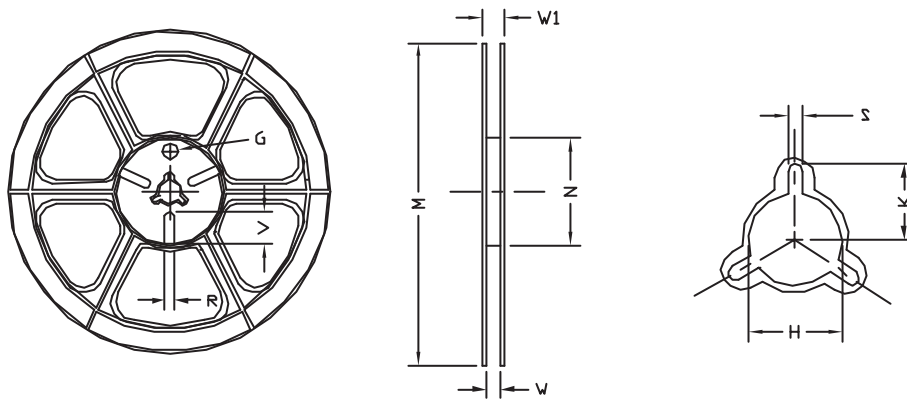
SOT-23 Carrier Tape



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