



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

PRODUCT SUMMARY (N-Channel)		
V _{DSS}	I _D	R _{DS(ON)} (m Ω) Max
55V	4.5A	50 @ V _{GS} = 10V
		75 @ V _{GS} = 4.5V

PRODUCT SUMMARY (P-Channel)		
V _{DSS}	I _D	R _{DS(ON)} (m Ω) Max
-55V	-3A	110 @ V _{GS} = -10V
		145 @ V _{GS} = -4.5V



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

Parameter		Symbol	N-Channel	P-Channel	Unit
Drain-Source Voltage Rating		V _{spike} ^d	60	-60	V
Drain-Source Voltage		V _{DS}	55	-55	V
Gate-Source Voltage		V _{GS}	±20	±20	V
Drain Current-Continuous ^a @ T _a	25°C	I _D	4.5	-3	A
	70°C		3.8	-2.5	A
-Pulsed ^b		I _{DM}	20	-15	A
Drain-Source Diode Forward Current ^a		I _S	1.7	-1.7	A
Maximum Power Dissipation ^a	T _a = 25°C	P _D	2		W
	T _a =70°C		1.44		
Operating Junction and Storage Temperature Range		T _J , T _{STG}	-55 to 150		°C

THERMAL CHARACTERISTICS

Thermal Resistance, Junction-to-Ambient ^a	R _{θJA}	62.5	°C/W
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N-Channel ELECTRICAL CHARACTERISTICS ($T_A = 25\text{ }^{\circ}\text{C}$ unless otherwise noted)

Parameter	Symbol	Condition	Min	Typ ^c	Max	Unit
OFF CHARACTERISTICS						
Drain-Source Breakdown Voltage	BV_{DSS}	$V_{GS} = 0V, I_D = 250\mu A$	55			V
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS} = 44V, V_{GS} = 0V$			1	μA
Gate-Body Leakage	I_{GSS}	$V_{GS} = \pm 20V, V_{DS} = 0V$			± 100	nA
ON CHARACTERISTICS ^b						
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = 250\mu A$	1.4	2	2.5	V
Drain-Source On-State Resistance	$R_{DS(on)}$	$V_{GS} = 10V, I_D = 4.5A$		35	50	m ohm
		$V_{GS} = 4.5V, I_D = 4A$		60	75	m ohm
On-State Drain Current	$I_{D(on)}$	$V_{DS} = 5V, V_{GS} = 10V$	15			A
Forward Transconductance	g_{FS}	$V_{DS} = 5V, I_D = 4.5A$		9		S
DYNAMIC CHARACTERISTICS ^c						
Input Capacitance	C_{ISS}	$V_{DS} = 25V, V_{GS} = 0V$ $f = 1.0MHz$		900	1170	pF
Output Capacitance	C_{OSS}			80	104	pF
Reverse Transfer Capacitance	C_{RSS}			60	78	pF
Gate resistance	R_g	$V_{GS} = 0V, V_{DS} = 0V, f = 1.0MHz$		2		ohm
SWITCHING CHARACTERISTICS ^c						
Turn-On Delay Time	$t_{D(on)}$	$V_{DD} = 30V$ $I_D = 1A$ $V_{GS} = 10V$ $R_{GEN} = 6\text{ ohm}$		15	45	ns
Rise Time	t_r			5	11	ns
Turn-Off Delay Time	$t_{D(off)}$			27	60	ns
Fall Time	t_f			10	23	ns
Total Gate Charge	Q_g	$V_{DS} = 30V, I_D = 4.5A, V_{GS} = 10V$		19	25	nC
		$V_{DS} = 30V, I_D = 4.5A, V_{GS} = 4.5V$		9.5	13	nC
Gate-Source Charge	Q_{gs}	$V_{DS} = 30V, I_D = 4.5A$		4	6	nC
Gate-Drain Charge	Q_{gd}	$V_{GS} = 4.5V$		3.6	5	nC

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P-Channel ELECTRICAL CHARACTERISTICS (TA = 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	-55			V
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} = -44V, V _{GS} = 0V			-1	uA
Gate-Body Leakage	I _{GSS}	V _{GS} = ±20V, V _{DS} = 0V			±100	nA
ON CHARACTERISTICS ^b						
Gate Threshold Voltage	V _{GS(th)}	V _{DS} = V _{GS} , I _D = -250uA	-1.4	-1.6	-2.5	V
Drain-Source On-State Resistance	R _{DS(ON)}	V _{GS} = -10V, I _D = -3A		87	110	m ohm
		V _{GS} = -4.5V, I _D = -2A		125	145	m ohm
On-State Drain Current	I _{D(ON)}	V _{DS} = -5V, V _{GS} = -10V	10			A
Forward Transconductance	g _{FS}	V _{DS} = -5V, I _D = -3A		8		S
DYNAMIC CHARACTERISTICS ^c						
Input Capacitance	C _{ISS}	V _{DS} = -30V, V _{GS} = 0V f = 1.0MHz		970	1261	pF
Output Capacitance	C _{OSS}			60	80	pF
Reverse Transfer Capacitance	C _{RSS}			40	60	pF
Gate resistance	R _g	V _{GS} = 0V, V _{DS} = 0V, f = 1.0MHz		2.5		ohm
SWITCHING CHARACTERISTICS ^c						
Turn-On Delay Time	t _{D(ON)}	V _{DD} = -30V R _L = 15 ohm V _{GS} = -10V R _{GEN} = 6 ohm		20	60	ns
Rise Time	t _r			8	17	ns
Turn-Off Delay Time	t _{D(OFF)}			95	209	ns
Fall Time	t _f			22	50	ns
Total Gate Charge	Q _g	V _{DS} = -30V, I _D = -3A, V _{GS} = -10V		20	26	nC
		V _{DS} = -30V, I _D = -3A, V _{GS} = -4.5V		9	12	nC
Gate-Source Charge	Q _{gs}	V _{DS} = -30V, I _D = -3 A		5	7	nC
Gate-Drain Charge	Q _{gd}	V _{GS} = -4.5V		3	4	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}	$V_{GS} = 0V, I_S = 1.7A$	N-Ch		0.82	1.2	V
		$V_{GS} = 0V, I_S = -1.7A$	P-Ch		-0.84	-1.2	

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.
- d. Guaranteed when external $R_g = 6 \text{ohm}$ and $t_f < t_{f \text{ max}}$

N-Channel

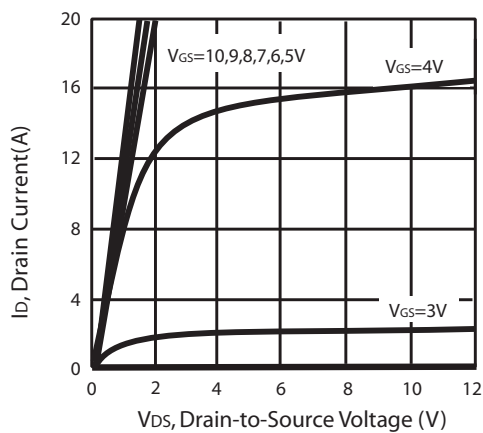


Figure 1. Output Characteristics

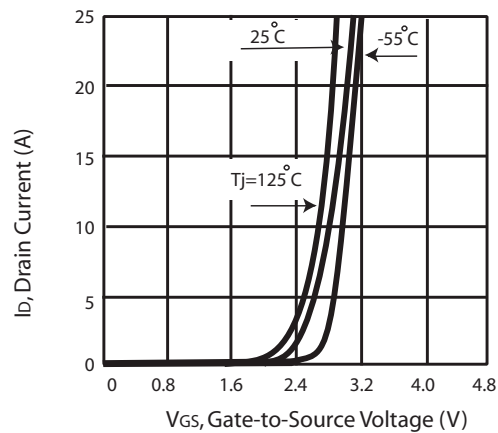


Figure 2. Transfer Characteristics

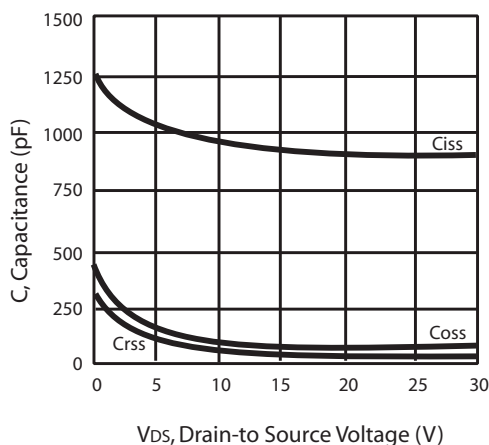


Figure 3. Capacitance

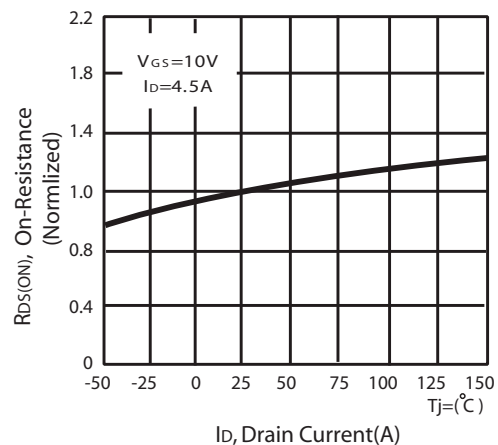


Figure 4. On-Resistance Variation with Drain Current and Temperature

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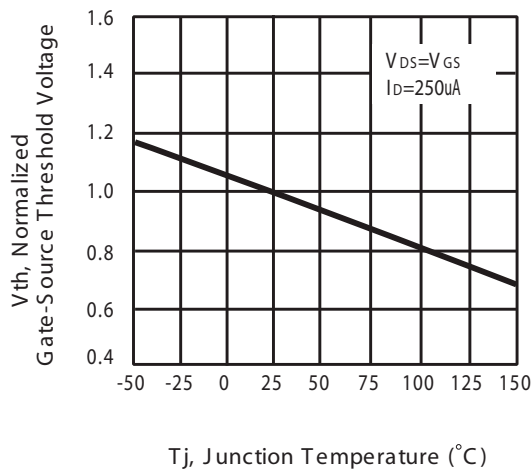


Figure 5. Gate Threshold Voltage Variation with Temperature

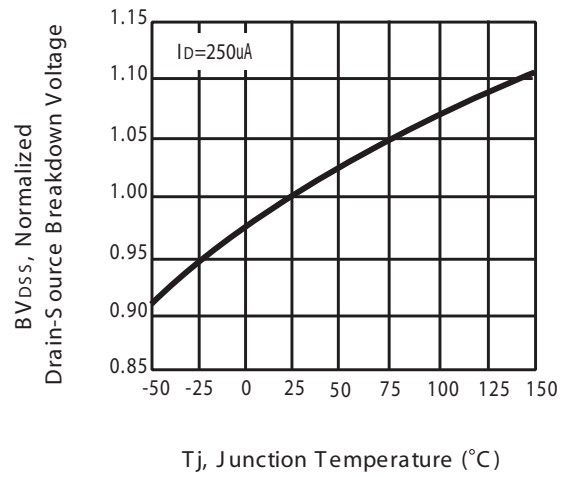


Figure 6. Breakdown Voltage Variation with Temperature

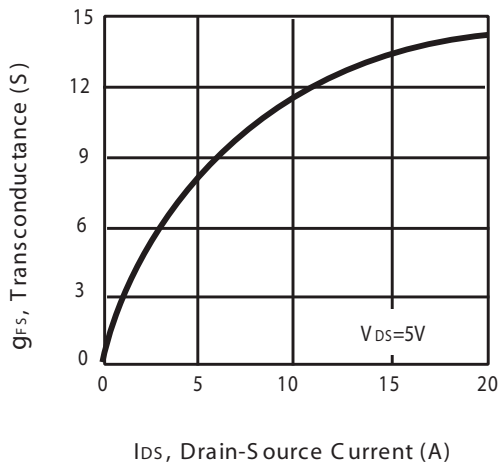


Figure 7. Transconductance Variation with Drain Current

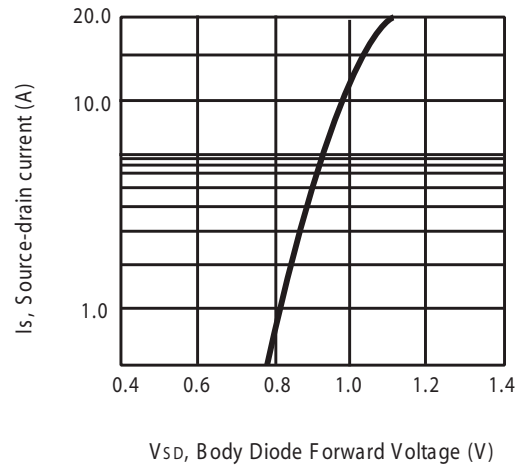


Figure 8. Body Diode Forward Voltage Variation with Source Current

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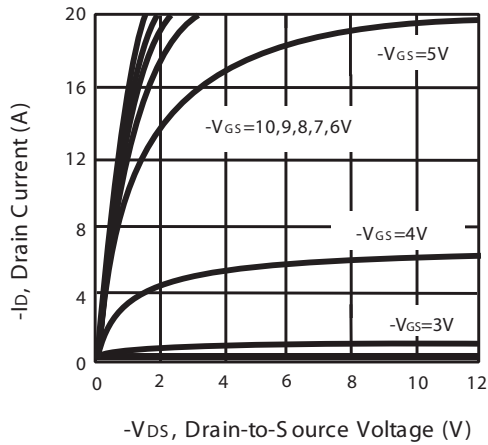


Figure 1. Output Characteristics

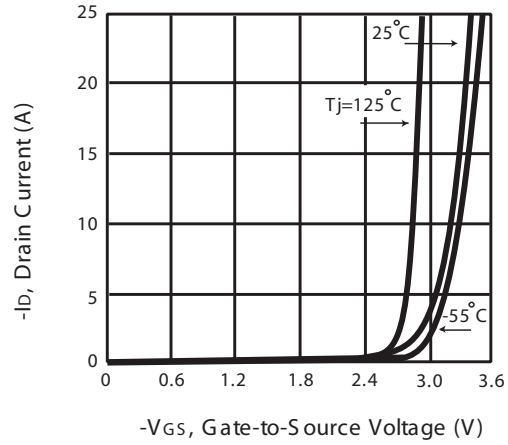


Figure 2. Transfer Characteristics

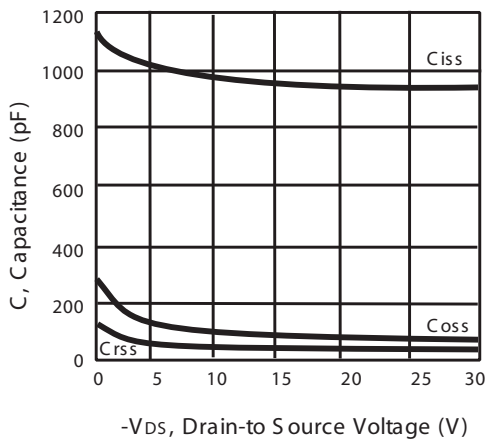


Figure 3. Capacitance

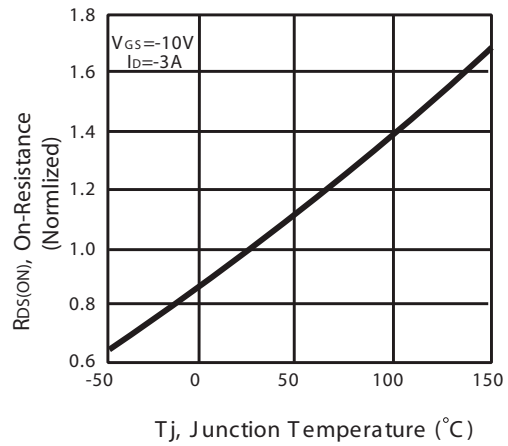


Figure 4. On-Resistance Variation with Temperature

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P-Channel

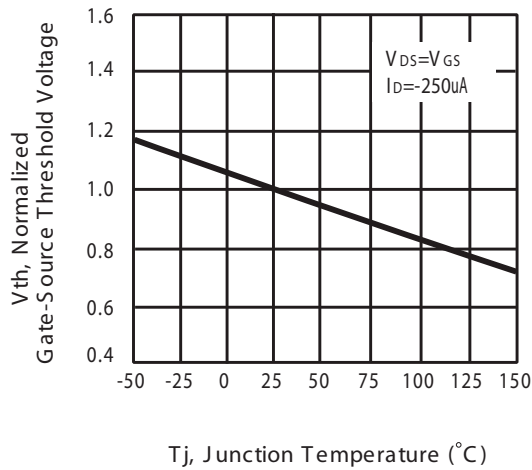


Figure 5. Gate Threshold Voltage Variation with Temperature

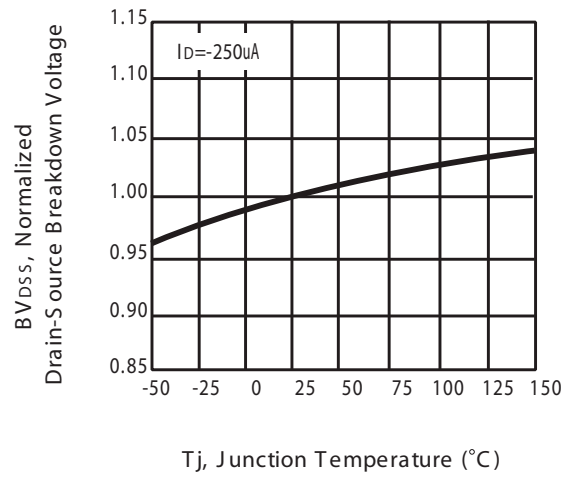


Figure 6. Breakdown Voltage Variation with Temperature

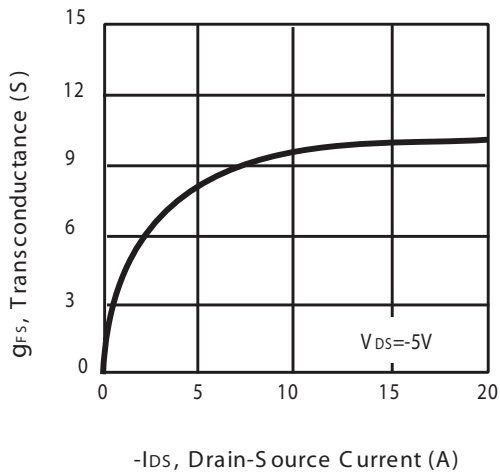


Figure 7. Transconductance Variation with Drain Current

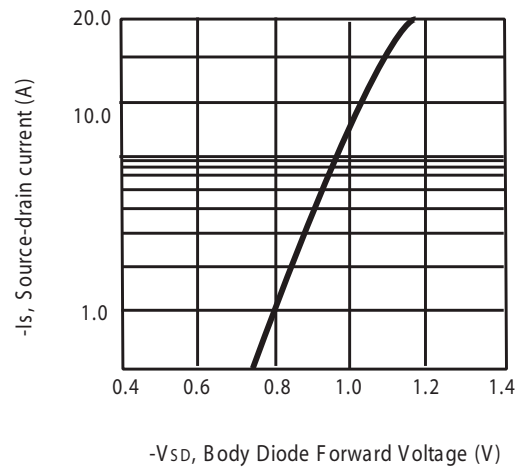
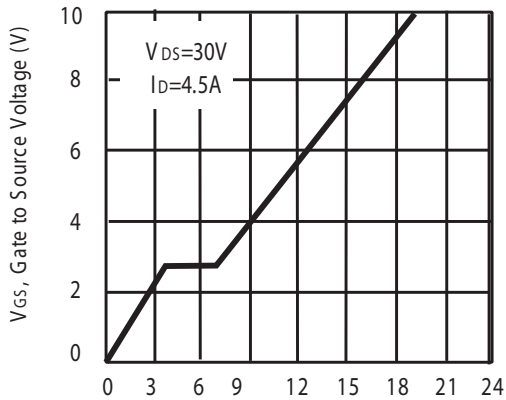


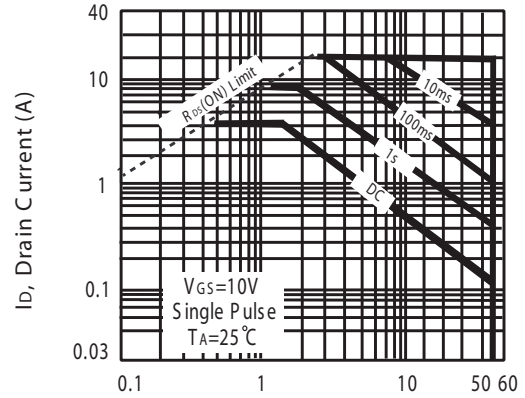
Figure 8. Body Diode Forward Voltage Variation with Source Current

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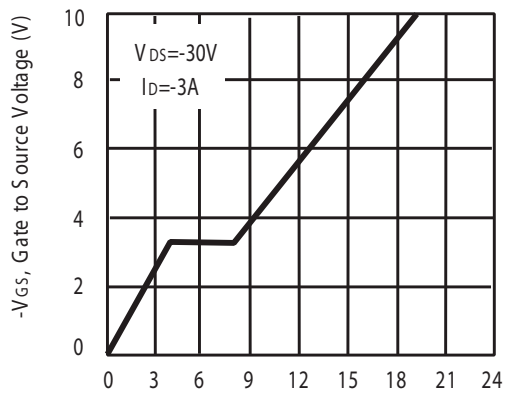


Q_g, Total Gate Charge (nC)
Figure 9. Gate Charge

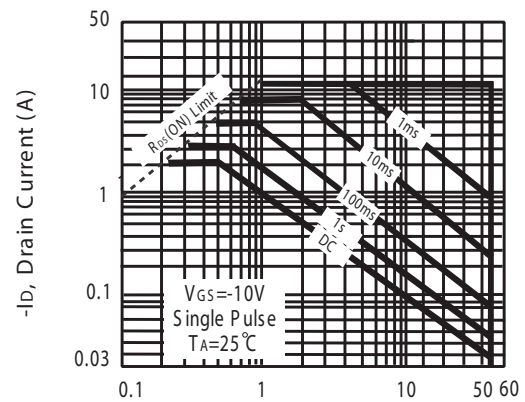


V_{DS}, Drain-Source Voltage (V)
Figure 10. Maximum Safe Operating Area

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Q_g, Total Gate Charge (nC)
Figure 9. Gate Charge



-V_{DS}, Body Diode Forward Voltage (V)
Figure 10. Maximum Safe Operating Area

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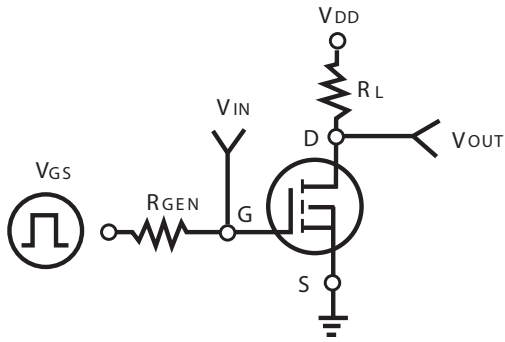


Figure 11. Switching Test Circuit

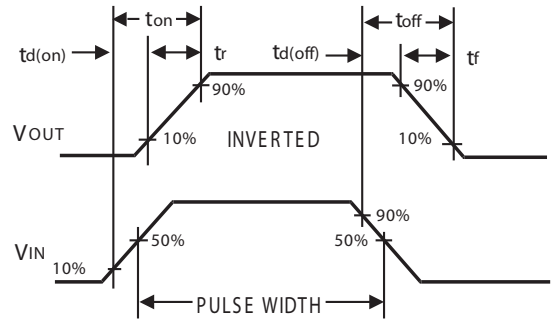
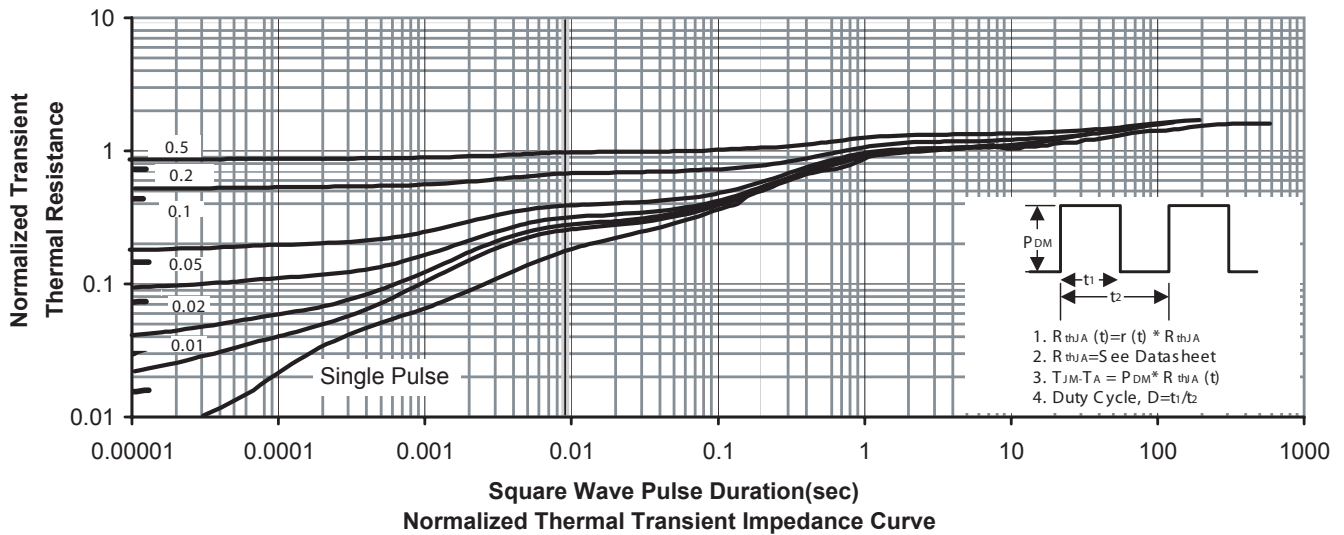
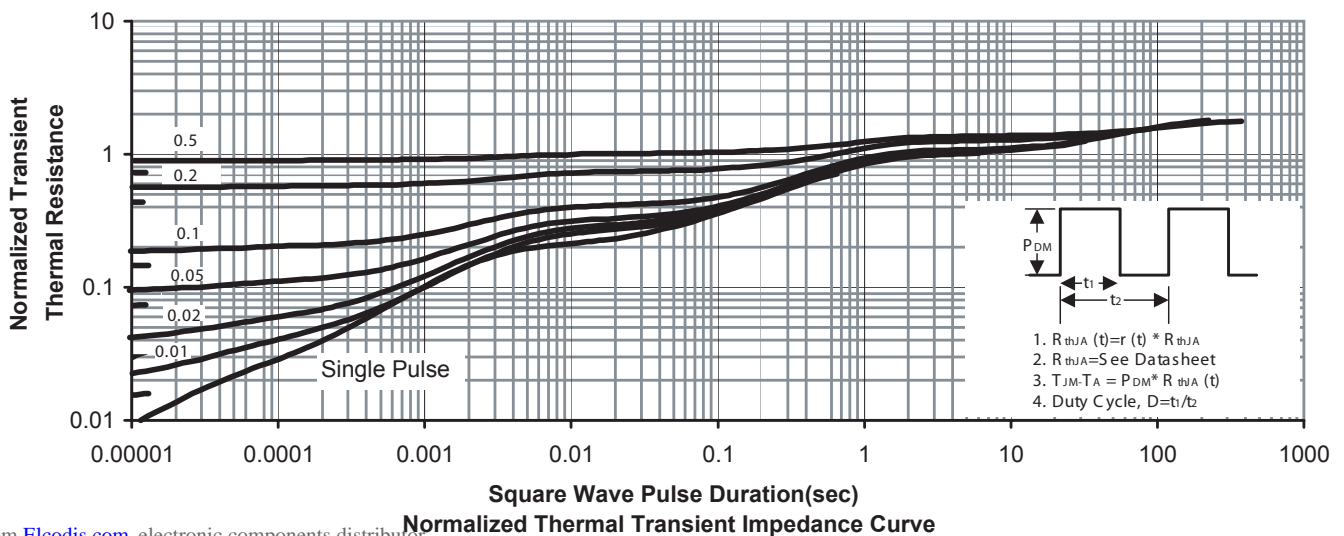


Figure 12. Switching Waveforms

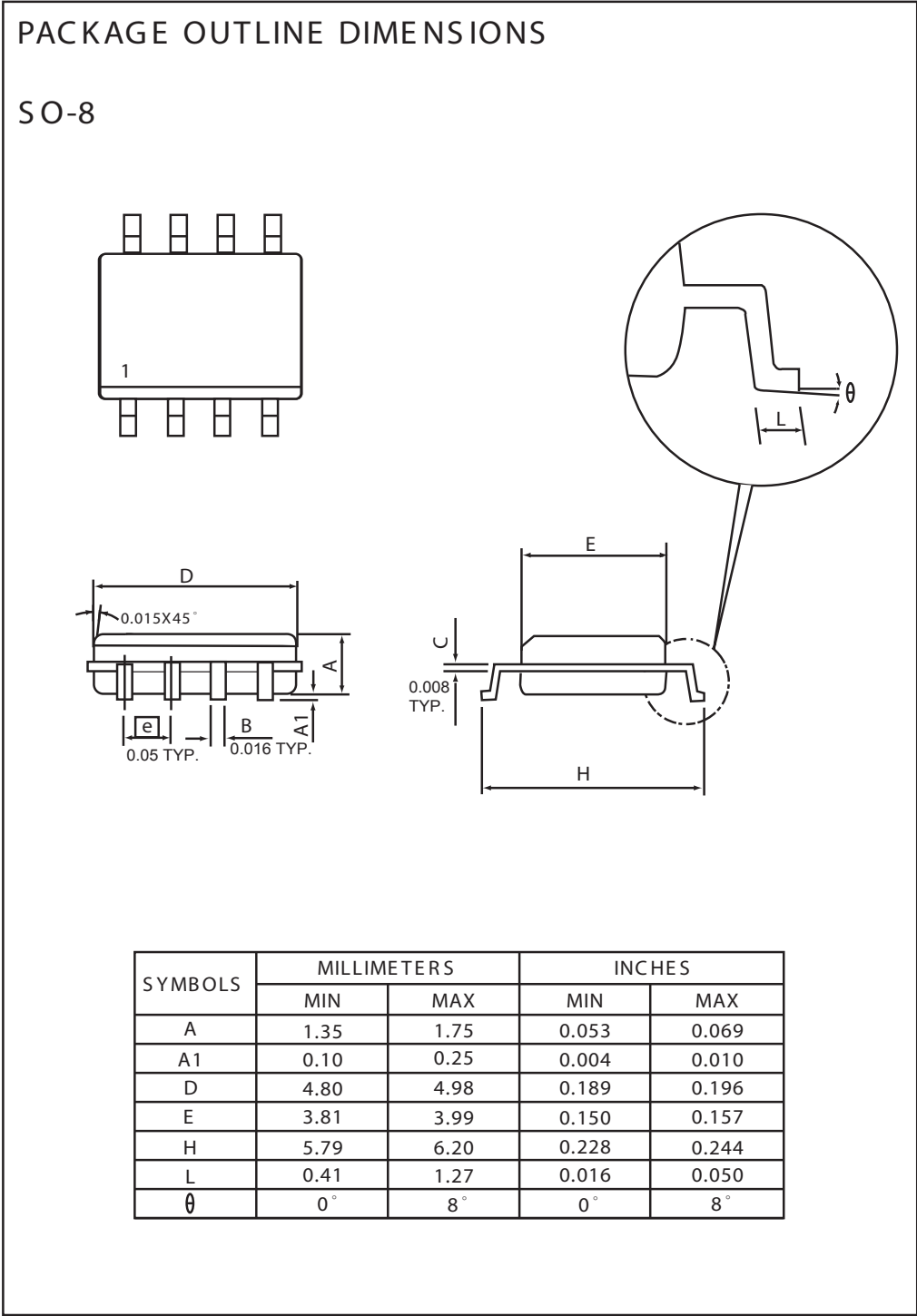
N-Channel



P-Channel



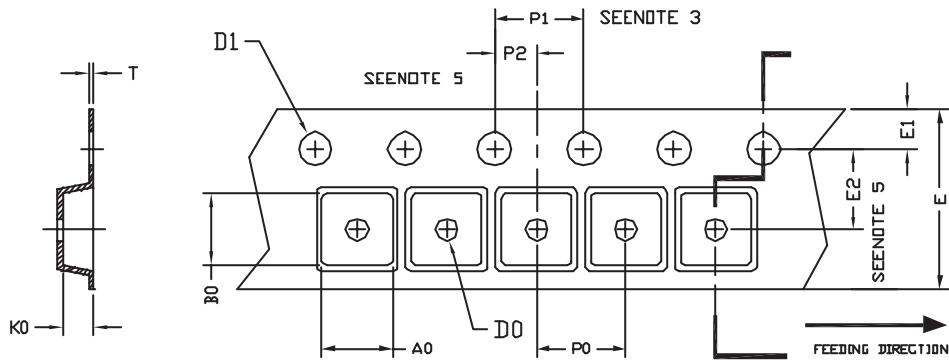
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SO-8 Tape and Reel Data

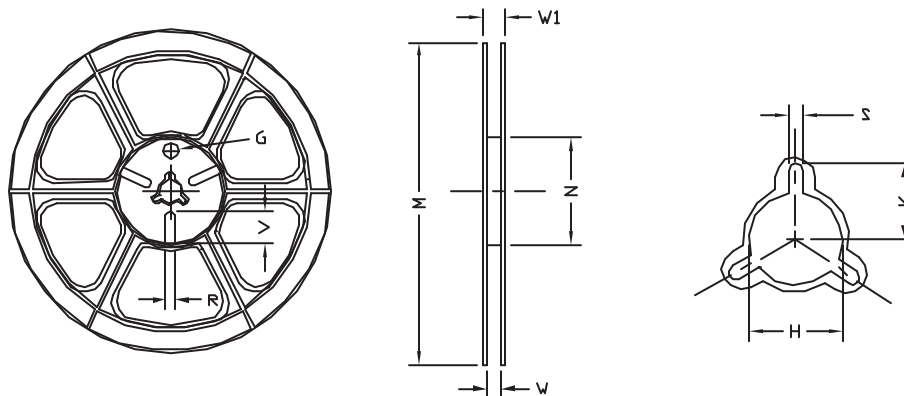
SO-8 Carrier Tape



unit:mm

PACKAGE	A0	B0	K0	D0	D1	E	E1	E2	P0	P1	P2	T
SOP 8N 150mil	6.40	5.20	2.10	ϕ 1.5 (MIN)	ϕ 1.5 + 0.1 - 0.0	12.0 \pm 0.3	1.75	5.5 \pm 0.05	8.0	4.0	2.0 \pm 0.05	0.3 \pm 0.05

SO-8 Reel



UNIT:mm

TAPE SIZE	REEL SIZE	M	N	W	W1	H	K	S	G	R	V
12 mm	ϕ 330	330 \pm 1	62 \pm 1.5	12.4 + 0.2	16.8 - 0.4	ϕ 12.75 + 0.15	---	2.0 \pm 0.15	---	---	---