



P-Channel Enhancement Mode Field Effect Transistor

PRODUCT SUMMARY

VDSS	ID	RDS(ON) (mΩ) Max
-30V	-14A	8.5 @ VGS=-10V
		13 @ VGS=-4.5V

FEATURES

- Super high dense cell design for low RDS(ON).
- Rugged and reliable.
- Surface Mount Package.
- ESD Protected



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

Symbol	Parameter	Limit	Units
V _{DS}	Drain-Source Voltage	-30	V
V _{GS}	Gate-Source Voltage	±20	V
I _D	Drain Current-Continuous ^a	T _A =25°C	-14
		T _A =70°C	-11.2
I _{DM}	-Pulsed ^b	-79	A
E _{AS}	Single Pulse Avalanche Energy ^d	180	mJ
P _D	Maximum Power Dissipation ^a	T _A =25°C	2.5
		T _A =70°C	1.6
T _J , T _{STG}	Operating Junction and Storage Temperature Range	-55 to 150	°C

THERMAL CHARACTERISTICS

Symbol	Parameter	Limit	Units
R _{θJA}	Thermal Resistance, Junction-to-Ambient ^a	50	°C/W

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

Symbol	Parameter	Conditions	Min	Typ	Max	Units
OFF CHARACTERISTICS						
BV _{DSS}	Drain-Source Breakdown Voltage	V _{GS} =0V, I _D =-250uA	-30			V
I _{DSS}	Zero Gate Voltage Drain Current	V _{DS} = -24V, V _{GS} =0V			-1	uA
I _{GSS}	Gate-Body Leakage Current	V _{GS} = ±20V, V _{DS} =0V			±10	nA
ON CHARACTERISTICS						
V _{GS(th)}	Gate Threshold Voltage	V _{DS} =V _{GS} , I _D =-250uA	-0.8	-1.7	-2.0	V
R _{DS(ON)}	Drain-Source On-State Resistance	V _{GS} =-10V, I _D =-14A		7	8.5	m ohm
		V _{GS} =-4.5V, I _D =-11.3A		9.8	13	m ohm
g _{FS}	Forward Transconductance	V _{DS} =-10V, I _D =-14A		32		S
DYNAMIC CHARACTERISTICS ^c						
C _{ISS}	Input Capacitance	V _{DS} =-15V, V _{GS} =0V f=1.0MHz		4049		pF
C _{OSS}	Output Capacitance			641		pF
C _{RSS}	Reverse Transfer Capacitance			351		pF
SWITCHING CHARACTERISTICS ^c						
t _{D(ON)}	Turn-On Delay Time	V _{DD} =-15V I _D =-1A V _{GS} =-10V R _{GEN} =3 ohm		24		ns
t _r	Rise Time			68		ns
t _{D(OFF)}	Turn-Off Delay Time			484		ns
t _f	Fall Time			188		ns
Q _g	Total Gate Charge	V _{DS} =-15V, I _D =-14A, V _{GS} =-10V		95		nC
		V _{DS} =-15V, I _D =-14A, V _{GS} =-4.5V		40		nC
Q _{gs}	Gate-Source Charge	V _{DS} =-15V, I _D =-14A,		6		nC
Q _{gd}	Gate-Drain Charge	V _{GS} =-10V		23		nC
DRAIN-SOURCE DIODE CHARACTERISTICS AND MAXIMUM RATINGS						
I _s	Maximum Continuous Drain-Source Diode Forward Current				-2.0	A
V _{SD}	Diode Forward Voltage ^b	V _{GS} =0V, I _s =-2.0A		-0.7	-1.2	V

Notes

- Surface Mounted on FR4 Board, $t \leq 10\text{sec}$.
- Pulse Test: Pulse Width $\leq 300\mu\text{s}$, Duty Cycle $\leq 2\%$.
- Guaranteed by design, not subject to production testing.
- Starting $T_J=25^{\circ}\text{C}$, $L=3.0\text{mH}$, $V_{DD} = 30\text{V}$, $V_{GS}=10\text{V}$. (See Figure 13)

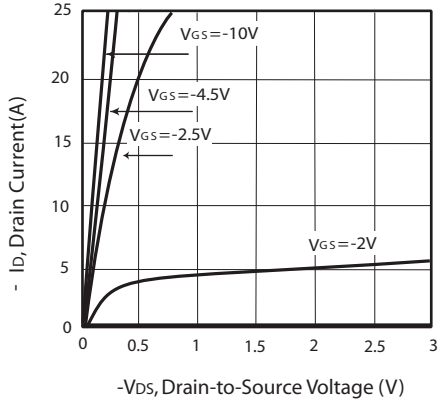


Figure 1. Output Characteristics

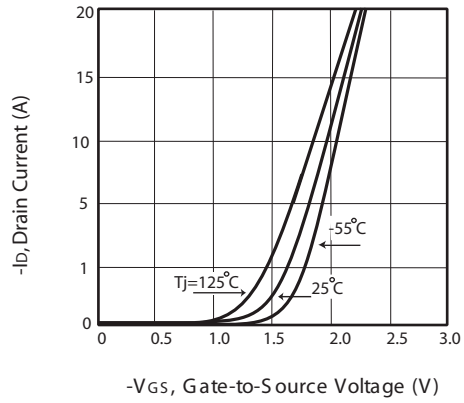


Figure 2. Transfer Characteristics

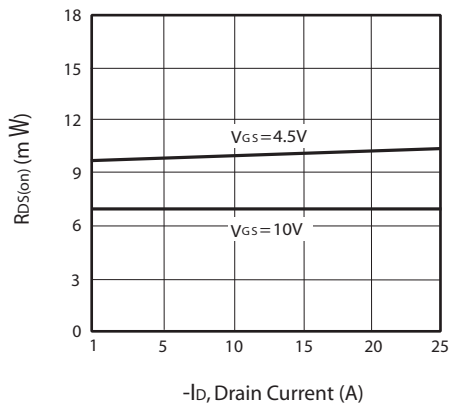


Figure 3. On-Resistance vs. Drain Current and Gate Voltage

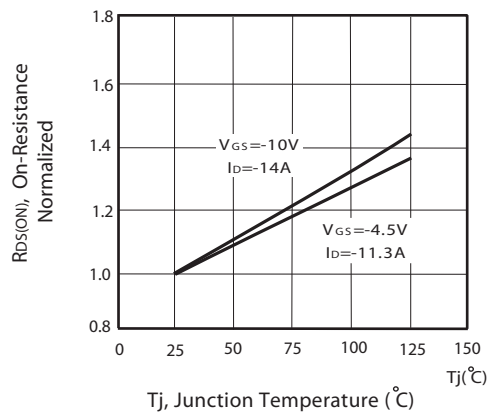


Figure 4. On-Resistance Variation with Drain Current and Temperature

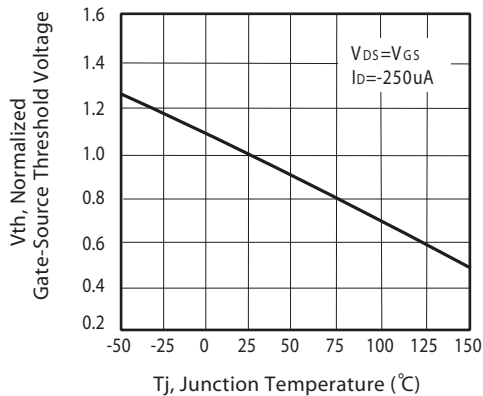


Figure 5. Gate Threshold Variation with Temperature

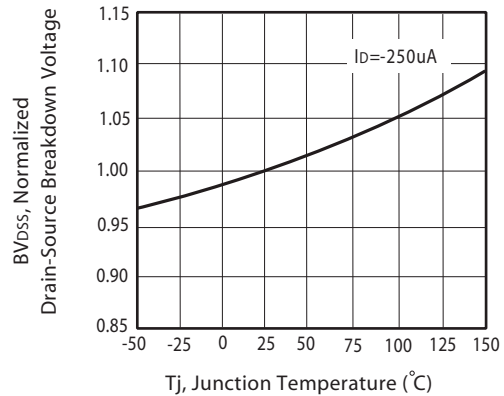


Figure 6. Breakdown Voltage Variation with Temperature

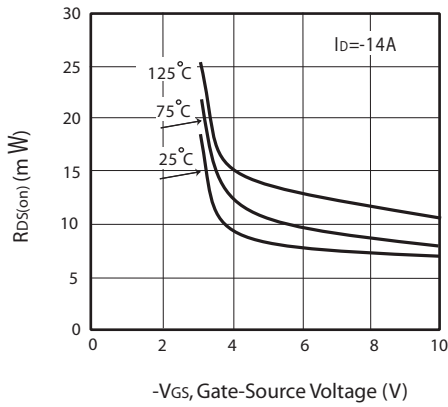


Figure 7. On-Resistance vs. Gate-Source Voltage

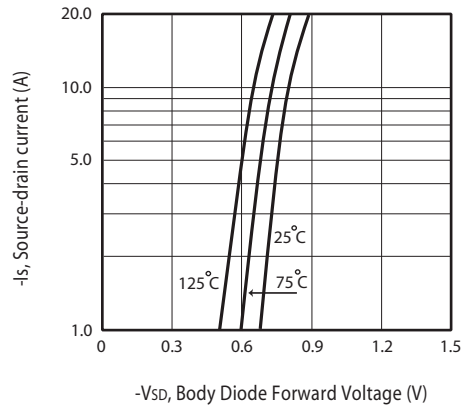


Figure 8. Body Diode Forward Voltage Variation with Source Current

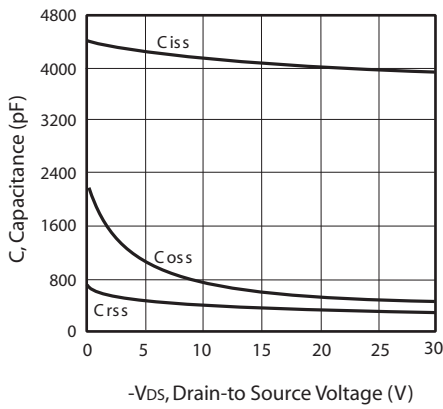


Figure 9. Capacitance

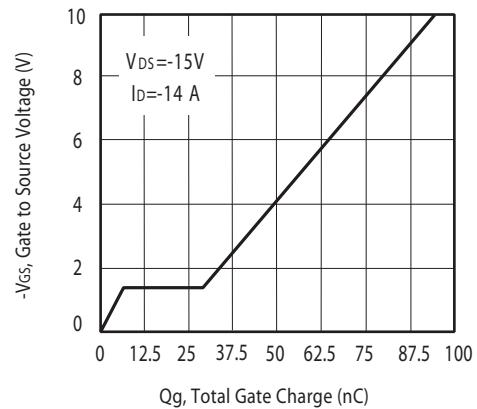


Figure 10. Gate Charge

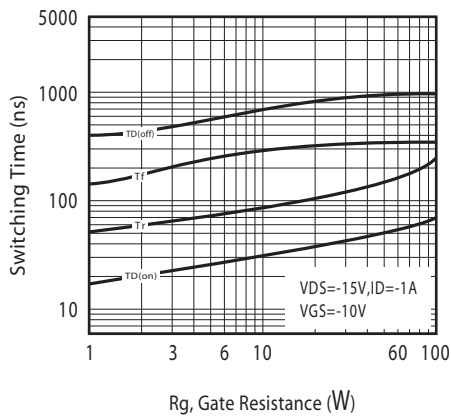


Figure 11. switching characteristics

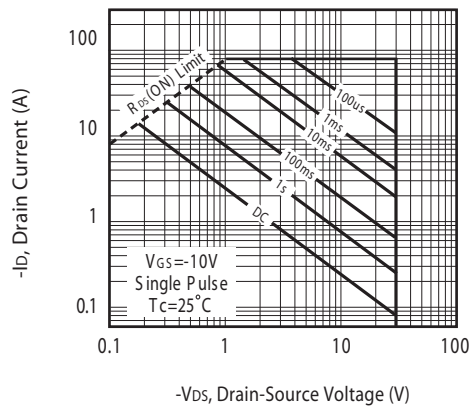
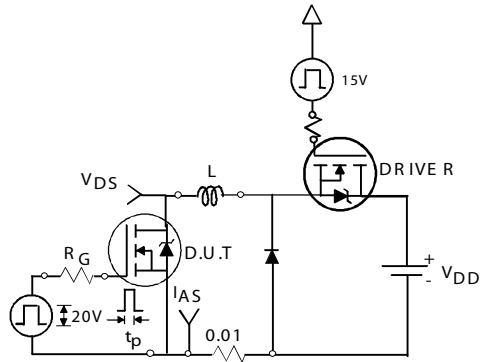
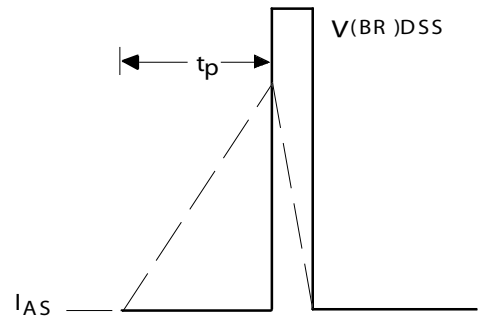


Figure 12. Maximum Safe Operating Area



Unclamped Inductive Test Circuit

Figure 13a.



Unclamped Inductive Waveforms

Figure 13b.

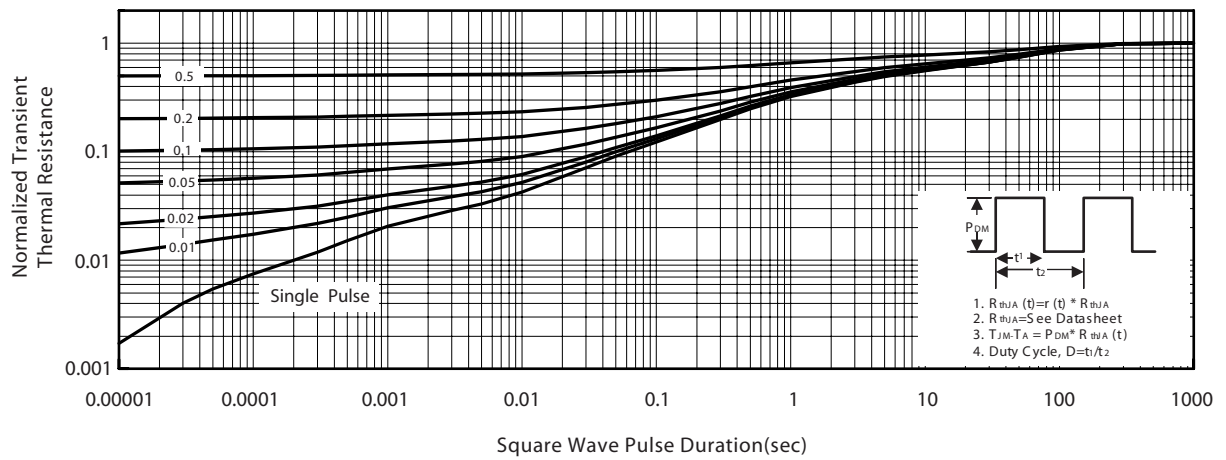
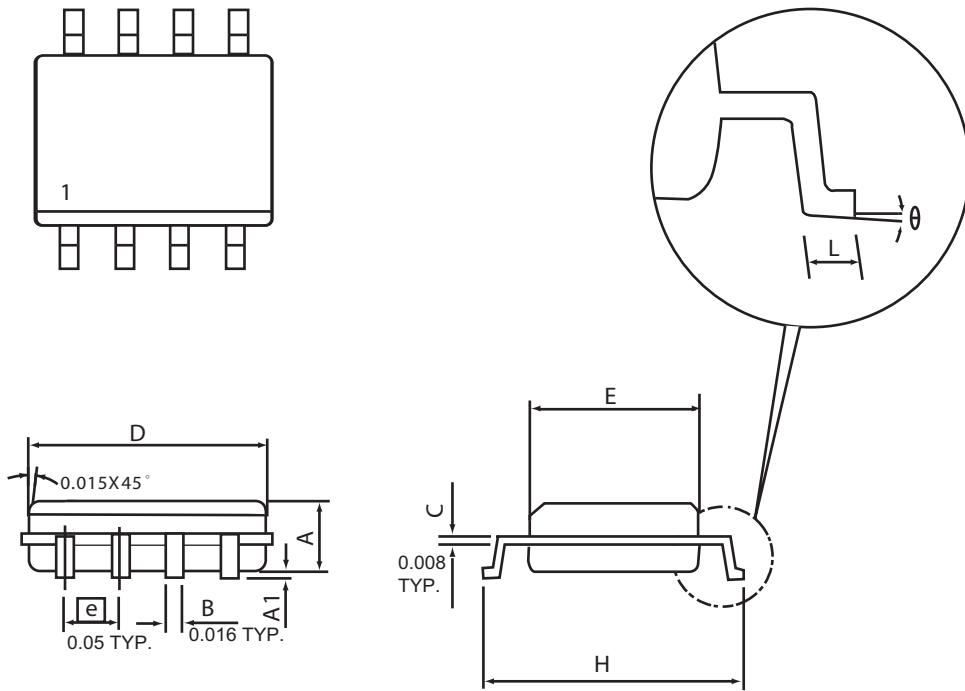


Figure 14. Normalized Thermal Transient Impedance Curve

PACKAGE OUTLINE DIMENSIONS

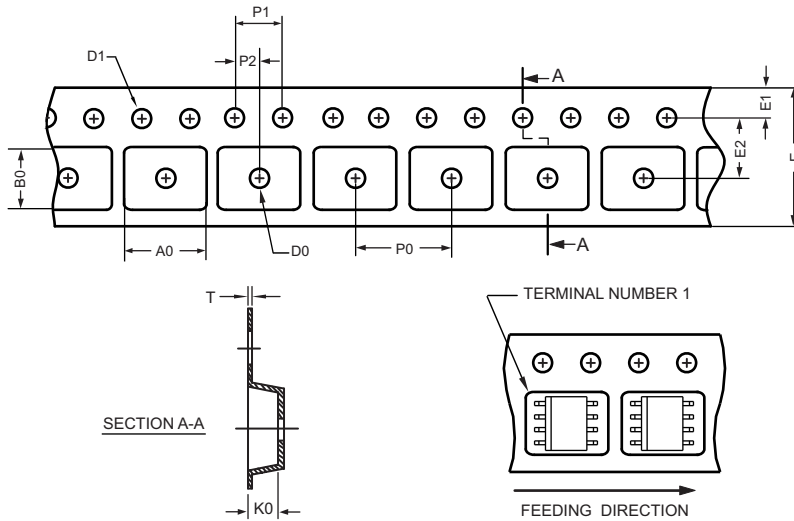
SO-8



SYMBOLS	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	1.35	1.75	0.053	0.069
A1	0.10	0.25	0.004	0.010
D	4.80	4.98	0.189	0.196
E	3.81	3.99	0.150	0.157
H	5.79	6.20	0.228	0.244
L	0.41	1.27	0.016	0.050
θ	0°	8°	0°	8°

SO-8 Tape and Reel Data

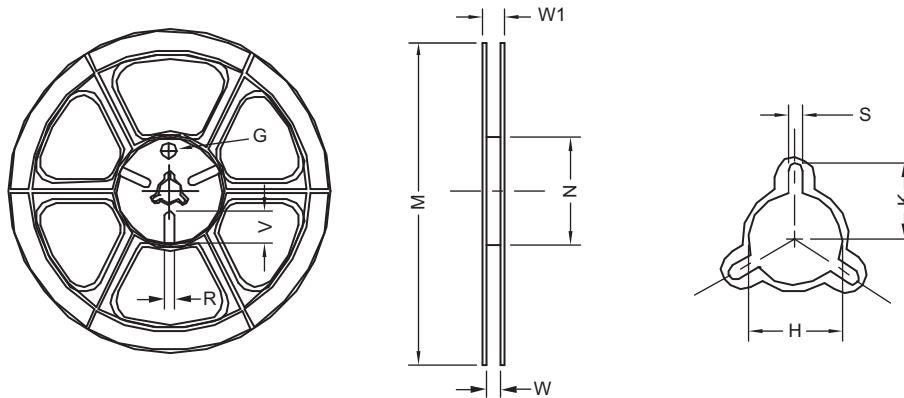
SO-8 Carrier Tape



unit:mm

PACKAGE	A0	B0	K0	D0	D1	E	E1	E2	P0	P1	P2	T
SOP 8N 150mil	6.50 ±0.15	5.25 ±0.10	2.10 ±0.10	φ 1.5 (MIN)	φ 1.55 ±0.10	12.0 +0.3 - 0.1	1.75 ±0.10	5.5 ±0.10	8.0 ±0.10	4.0 ±0.10	2.0 ±0.10	0.30 ±0.013

SO-8 Reel



UNIT:mm

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