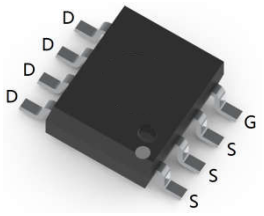
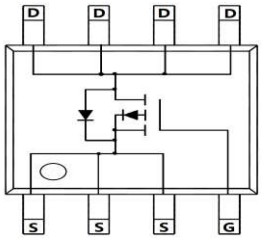
P-CHANNEL ENHANCEMENT MODE MOSFET

FEATURES

- Advanced trench process technology
- High density cell design for ultra low on-resistance
- Lead free product is acquired
- V_{DS}: -30V Max.,I_D:-12A Max.
- $R_{DS(ON)}$ ≤13mΩ@V_{GS}=-20V
  $R_{DS(ON)}$ ≤14mΩ@V_{GS}=-10V
  $R_{DS(ON)}$ ≤30mΩ@V_{GS}=-5V



SOP-8



MECHANICAL DATA

- Case: SOP-8
- Case material: Molded plastic. UL flammability
- Classification rating: 94V-0
- Weight: 0.3 grams (approximate)

MAXIMUM RATINGS(T_A=25°C unless otherwise specified)

Parameter		Symbol	10 Sec	Steady state	Unit
Drain-source voltage		V_{DS}	-30		V
Gate-source voltage		V_{GS}	±25		V
Continuous drain current	T_A=25°C	I_D	-12	-9.2	A
	T_A=70°C		-10	-7.4	
Pulsed drain current (note 1)		I_{DM}	-60		
Avalanche current (note 1)		I_{AR}	26		
Repetitive avalanche energy L=0.3Mh (note 1)		E_{AR}	101		mJ
Power dissipation (note 2)	T_A=25°C	P_D	3.1	1.7	W
	T_A=70°C		2.0	1.1	
Junction and storage temperature range		T_J, T_{STG}	-55 to 150		°C
Maximum junction-to-ambient (note 3)		$R_{\theta JA}$	Typ.:32 Max.:40	Typ.:60 Max.:75	°C/W
Maximum junction-to-lead (note 3,4)		$R_{\theta JL}$		Typ.:17 Max.:24	

Note:

1. Repetitive rating, pulse width limited by junction temperature TJ(MAX)=150°C. Ratings are based on low frequency and duty cycles to keep initial T_J=25°C.
2. The power dissipation PD is based on TJ(MAX)=150°C, using ≤ 10s junction-to-ambient thermal resistance.
3. The value of R_{qJA} is measured with the device mounted on 1in2 FR-4 board with 2oz. Copper, in a still air environment with TA =25°C. The value in any given application depends on the user's specific board design.
4. The R_{qJA} is the sum of the thermal impedance from junction to lead R_{qJL} and lead to ambient.
5. The static characteristics in Figures 1 to 6 are obtained using <300ms pulses, duty cycle 0.5% max.
6. These curves are based on the junction-to-ambient thermal impedance which is measured with the device mounted on 1in2 FR-4 board with 2oz. copper, assuming a maximum junction temperature of TJ(MAX)=150°C. The SOA curve provides a single pulse rating.

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

Parameter	Symbol	Min	Typ	Max	Unit	Conditions
Drain-source breakdown voltage	V_{DSS}	-30			V	I_D=-250μA,V_{GS}=0V
Zero gate voltage drain current	I_{DSS}			-1	μA	V_{DS}=-30V,V_{GS} = 0V
				-5		V_{DS}=-30V,V_{GS}=0V,T_J=55°C
Gate-body leakage current	I_{GSS}			±100	nA	V_{DS}=0V,V_{GS}=±25V
Gate threshold voltage	$V_{GS(t}$	-1.7	-2.25	-2.8	V	V_{DS}=V_{GS},I_D=-250μA
On state drain current	$I_{D(ON)}$	-60			A	V_{GS}=-10V,V_{DS}=-5V
Static drain-source on-resistance	$R_{DS(ON)}$		8.5	13	mΩ	V_{GS}=-20V,I_D=-12A
			10	14		V_{GS}=-10V,I_D=-12A
			12	19		V_{GS}=-10V,I_D=-12A,T_J=125°C
			19	30		V_{GS}=-5V,I_D=-7A
Forward transconductance	g_{FS}		27		S	V_{DS}=-5V,I_D=-10.5A
Diode forward voltage	V_{SD}		-0.72	-1	V	I_S=-1A,V_{GS}=0V
Maximum body-diode continuous	I_S			-4	A	
Input capacitance	Ciss		2060	2600	pF	V_{GS}=0V,V_{DS}=-15V,f=1MHz
Output capacitance	Coss		370		pF	
Reverse transfer capacitance	Crss		295		pF	
Gate resistance	Rg	1.2	2.4	3.6	Ω	V_{GS}=0V,V_{DS}=0V,f=1MHz
Total gate charge	Qg	24	30	39	nC	V_{GS}=-10V,V_{DS}=-15V, I_D=-12A
Gate source charge	Qgs		4.6		nC	
Gate drain charge	Qgd		10		nC	
Turn-on delaytime	$t_{D(on)}$		11		ns	V_{GS}=-10V, V_{DS}=-15V, R_L=1.25Ω, R_{GEN}=3Ω
Turn-on rise time	tr		9.4		ns	
Turn-off delaytime	$t_{D(off)}$		24		ns	
Turn-off fall time	t_f		12		ns	
Body diode reverse recovery time	t_{rr}		30	40	ns	I_F=-12A, dI/dt=100A/μs
Body diode reverse recovery charge	Qrr		22		nC	

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TYPICAL CHARACTERISTICS

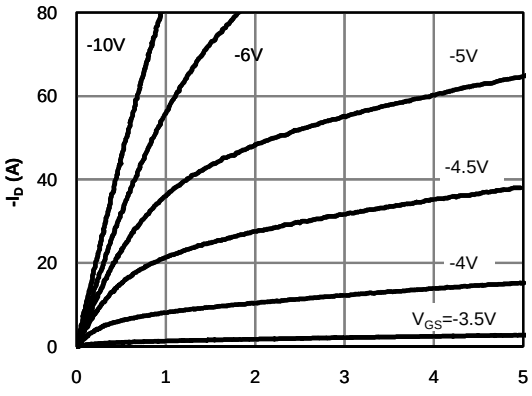

Fig 1: On-Region Characteristics (Note 5)

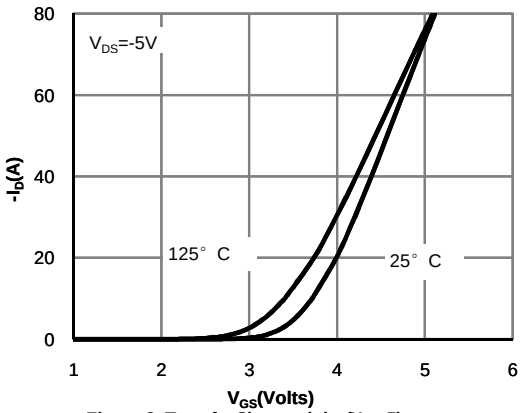

Figure 2: Transfer Characteristics (Note 5)

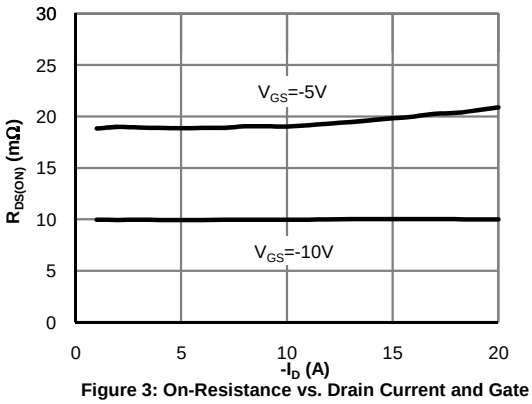

Figure 3: On-Resistance vs. Drain Current and Gate Voltage (Note 5)

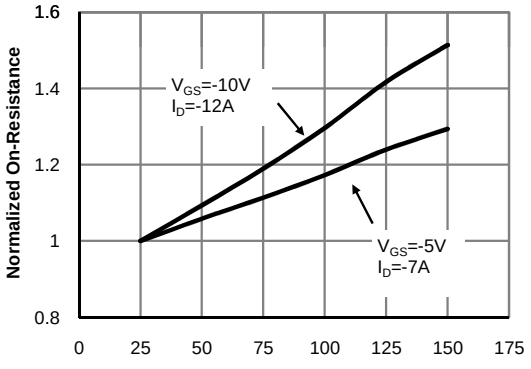

Figure 4: On-Resistance vs. Junction Temperature (Note 5)

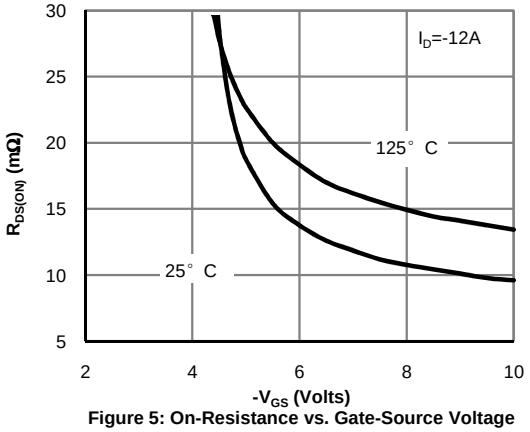

Figure 5: On-Resistance vs. Gate-Source Voltage

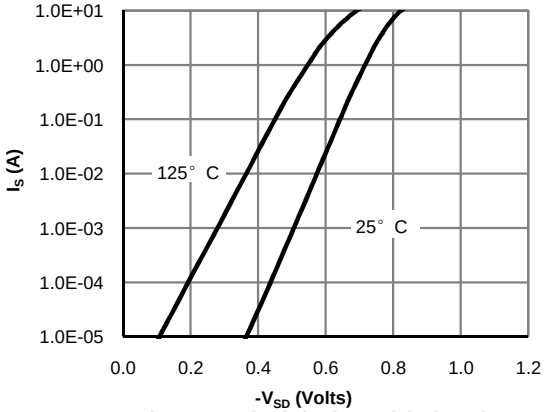

Figure 6: Body-Diode Characteristics (Note 5)

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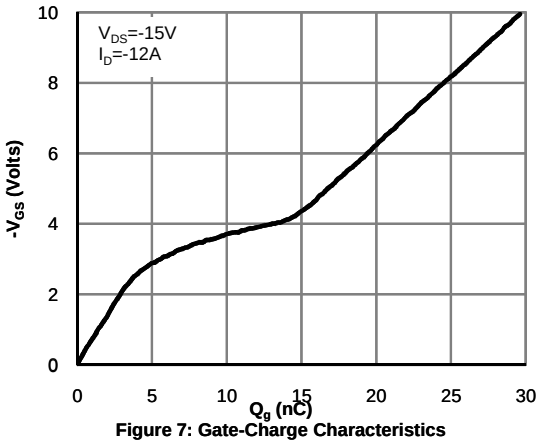


Figure 7: Gate-Charge Characteristics

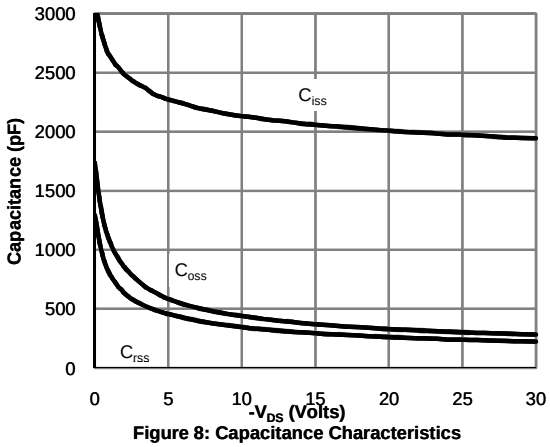


Figure 8: Capacitance Characteristics

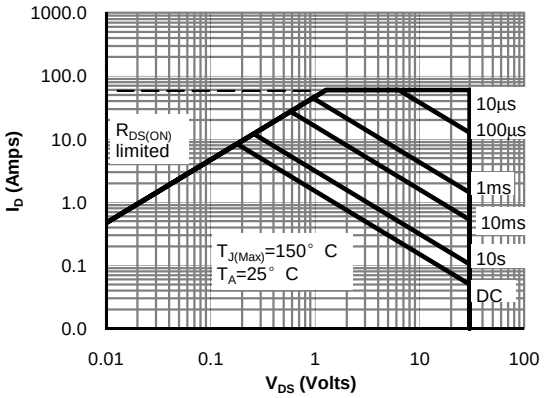
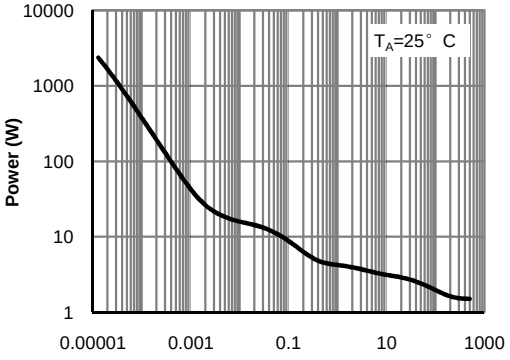
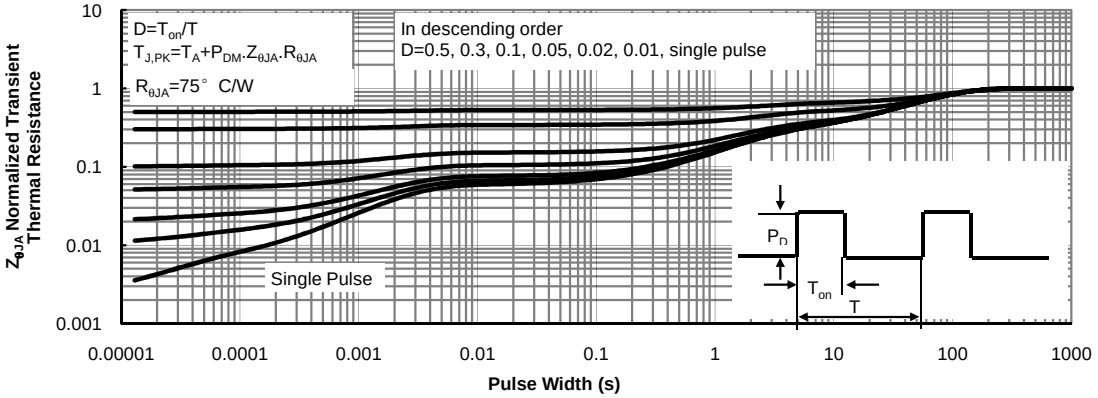


Figure 10: Maximum Forward Biased Safe Operating Area (Note 6)



Pulse Width (s)

Figure 11: Single Pulse Power Rating Junction-to-Ambient (Note 6)



Pulse Width (s)

Figure 12: Normalized Maximum Transient Thermal Impedance (Note 6)

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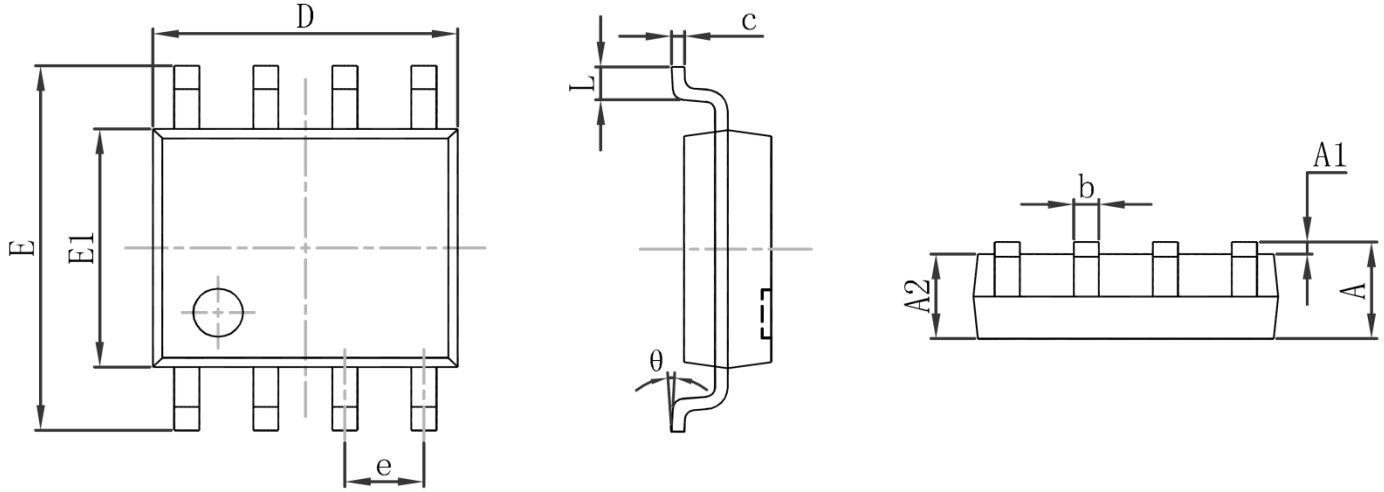
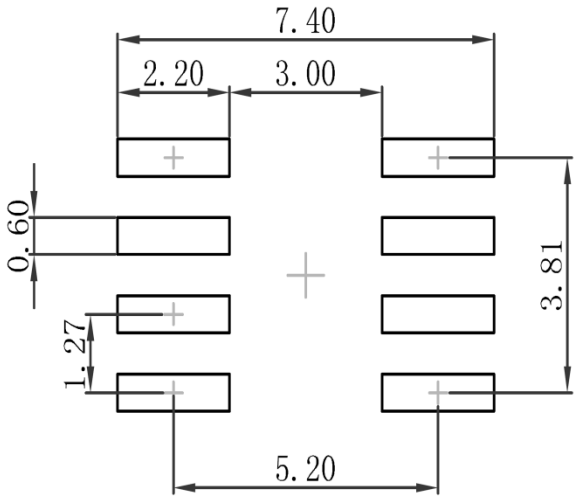
SOP-8 Package Outline Dimensions



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	1.350	1.750	0.053	0.069
A1	0.100	0.250	0.004	0.010
A2	1.350	1.550	0.053	0.061
b	0.330	0.510	0.013	0.020
c	0.170	0.250	0.007	0.010
D	4.800	5.000	0.189	0.197
e	1.270(BSC)		0.050（BSC）	
E	5.800	6.200	0.228	0.244
E1	3.800	4.000	0.150	0.157
L	0.400	1.270	0.016	0.050
θ	0°	8°	0°	8°

SOP-8 Suggested Pad Layout



Note:

1.Controlling dimension: in millimeters

2.General tolerance: ±0.05mm

3.The pad layout is for reference purposes only

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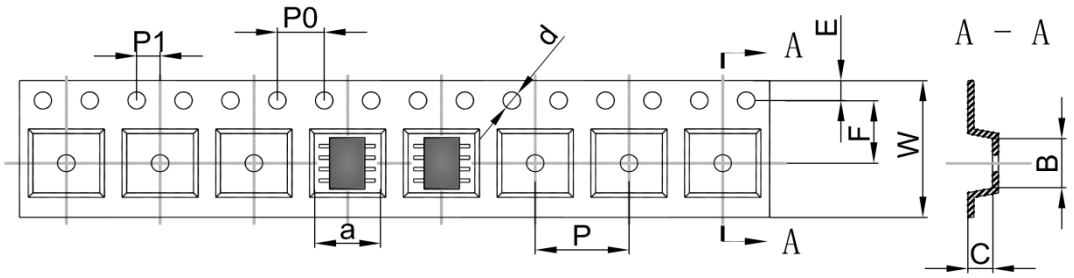
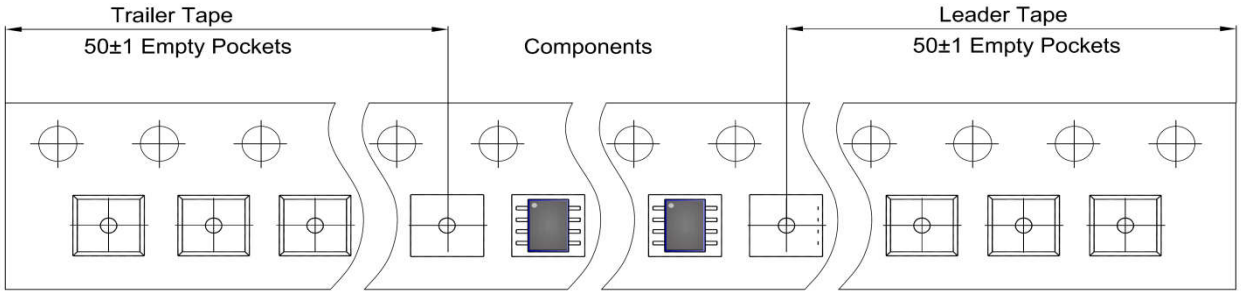
SOP-8 Tape and Reel

SOP-8 Embossed Carrier Tape

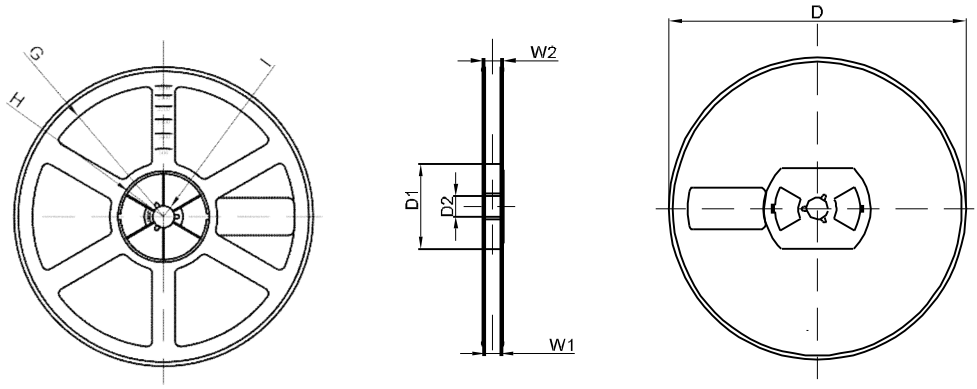


	DIMENSIONS ARE IN MILLIMETER									
TYPE	A	B	C	d	E	F	P0	P	P1	W
SOP-8	6.40	5.40	2.10	Ø1.50	1.75	5.50	4.00	8.00	2.00	12.00
TOLERANCE	±0.1	±0.1	±0.1	±0.1	±0.1	±0.1	±0.1	±0.1	±0.1	±0.1

SOP-8 Tape Leader and Trailer



SOP-8 Reel



	DIMENSIONS ARE IN MILLIMETER							
REEL OPTION	D	D1	D2	G	H	I	W1	W2
13” DIA	Ø330.00	100.00	13.00	R151.00	R56.00	R6.50	12.40	17.60
TOLERANCE	±2	±1	±1	±1	±1	±1	±1	±1