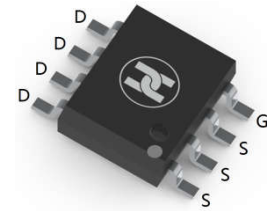
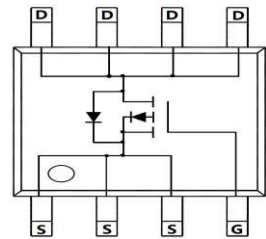


P-CHANNEL ENHANCEMENT MODE MOSFET
FEATURES

- 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.
- $R_{DS(ON)} \leq 13m\Omega @ V_{GS} = -20V$
 $R_{DS(ON)} \leq 14m\Omega @ V_{GS} = -10V$
 $R_{DS(ON)} \leq 30m\Omega @ V_{GS} = -5V$


SOP-8

MECHANICAL DATA

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

MAXIMUM RATINGS ($T_A = 25^\circ C$ 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	$T_A = 25^\circ C$	I_D	-12	-9.2	A
	$T_A = 70^\circ C$		-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)	$T_A = 25^\circ C$	P_D	3.1	1.7	W
	$T_A = 70^\circ C$		2.0	1.1	
Junction and storage temperature range		T_J, T_{STG}	-55 to 150		$^\circ C$
Maximum junction-to-ambient (note 3)		$R_{\theta JA}$	Typ.:32 Max.:40	Typ.:60 Max.:75	$^\circ C/W$
Maximum junction-to-lead (note 3,4)		$R_{\theta JL}$		Typ.:17 Max.:24	

Note:

1. Repetitive rating, pulse width limited by junction temperature $T_J(MAX) = 150^\circ C$. Ratings are based on low frequency and duty cycles to keep initial $T_J = 25^\circ C$.
2. The power dissipation P_D is based on $T_J(MAX) = 150^\circ C$, using $\leq 10s$ junction-to-ambient thermal resistance.
3. The value of $R_{\theta JA}$ is measured with the device mounted on 1in2 FR-4 board with 2oz. Copper, in a still air environment with $T_A = 25^\circ C$. The value in any given application depends on the user's specific board design.
4. The $R_{\theta JA}$ is the sum of the thermal impedance from junction to lead $R_{\theta JL}$ 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 $T_J(MAX) = 150^\circ C$. The SOA curve provides a single pulse rating.

P-CHANNEL ENHANCEMENT MODE MOSFET
ELECTRICAL CHARACTERISTICS ($T_A=25^{\circ}\text{C}$ unless otherwise specified)

Parameter	Symbol	Min	Typ	Max	Unit	Conditions
Drain-source breakdown voltage	V_{DSS}	-30			V	$I_D=-250\mu\text{A}, V_{GS}=0\text{V}$
Zero gate voltage drain current	I_{DSS}			-1	μA	$V_{DS}=-30\text{V}, V_{GS}=0\text{V}$
				-5		$V_{DS}=-30\text{V}, V_{GS}=0\text{V}, T_J=55^{\circ}\text{C}$
Gate-body leakage current	I_{GSS}			± 100	nA	$V_{DS}=0\text{V}, V_{GS}=\pm 25\text{V}$
Gate threshold voltage	$V_{GS(t)}$	-1.7	-2.25	-2.8	V	$V_{DS}=V_{GS}, I_D=-250\mu\text{A}$
On state drain current	$I_{D(ON)}$	-60			A	$V_{GS}=-10\text{V}, V_{DS}=-5\text{V}$
Static drain-source on-resistance	$R_{DS(ON)}$		8.5	13	m Ω	$V_{GS}=-20\text{V}, I_D=-12\text{A}$
			10	14		$V_{GS}=-10\text{V}, I_D=-12\text{A}$
			12	19		$V_{GS}=-10\text{V}, I_D=-12\text{A}, T_J=125^{\circ}\text{C}$
			19	30		$V_{GS}=-5\text{V}, I_D=-7\text{A}$
Forward transconductance	g_{FS}		27		S	$V_{DS}=-5\text{V}, I_D=-10.5\text{A}$
Diode forward voltage	V_{SD}		-0.72	-1	V	$I_S=-1\text{A}, V_{GS}=0\text{V}$
Maximum body-diode continuous	I_S			-4	A	
Input capacitance	C_{iss}		2060	2600	pF	
Output capacitance	C_{oss}		370		pF	$V_{GS}=0\text{V}, V_{DS}=-15\text{V}, f=1\text{MHz}$
Reverse transfer capacitance	C_{rss}		295		pF	
Gate resistance	R_g	1.2	2.4	3.6	Ω	$V_{GS}=0\text{V}, V_{DS}=0\text{V}, f=1\text{MHz}$
Total gate charge	Q_g	24	30	39	nC	
Gate source charge	Q_{gs}		4.6		nC	$V_{GS}=-10\text{V}, V_{DS}=-15\text{V}, I_D=-12\text{A}$
Gate drain charge	Q_{gd}		10		nC	
Turn-on delaytime	$t_{D(on)}$		11		ns	
Turn-on rise time	t_r		9.4		ns	$V_{GS}=-10\text{V}, V_{DS}=-15\text{V}, R_L=1.25\Omega, R_{GEN}=3\Omega$
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	
Body diode reverse recovery charge	Q_{rr}		22		nC	$I_F=-12\text{A}, dI/dt=100\text{A}/\mu\text{s}$

P-CHANNEL ENHANCEMENT MODE MOSFET

TYPICAL CHARACTERISTICS

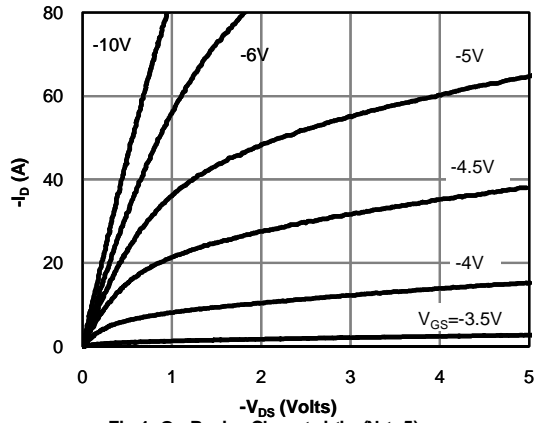


Fig 1: On-Region Characteristics (Note 5)

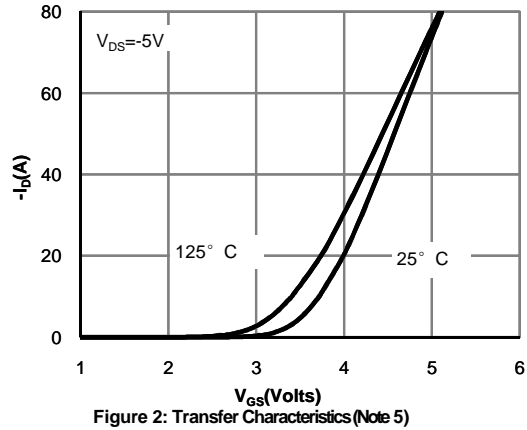


Figure 2: Transfer Characteristics (Note 5)

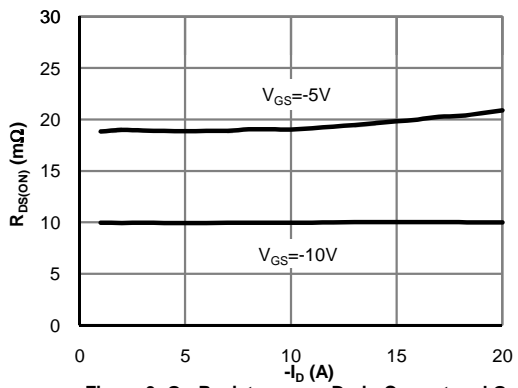


Figure 3: On-Resistance vs. Drain Current and Gate Voltage (Note 5)

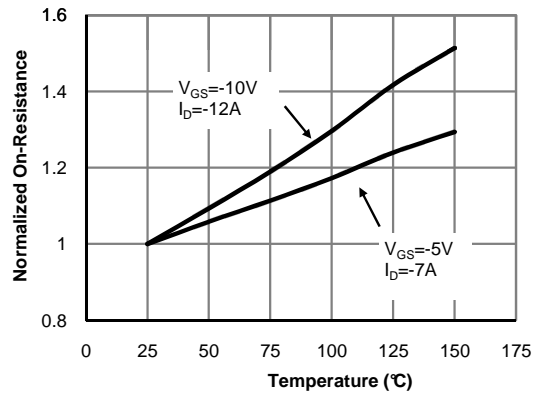


Figure 4: On-Resistance vs. Junction Temperature (Note 5)

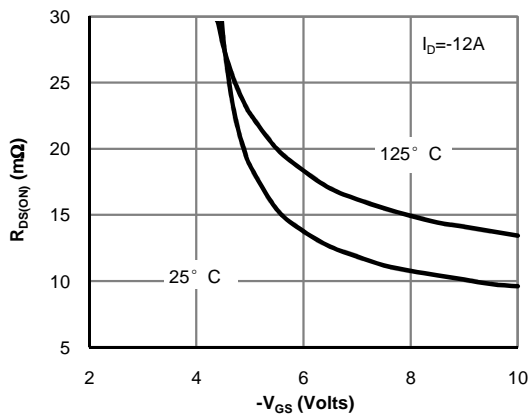


Figure 5: On-Resistance vs. Gate-Source Voltage

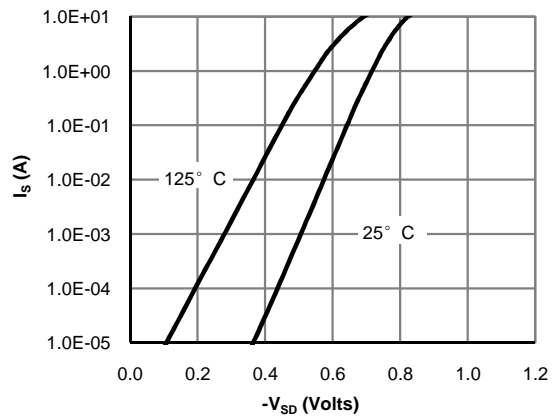
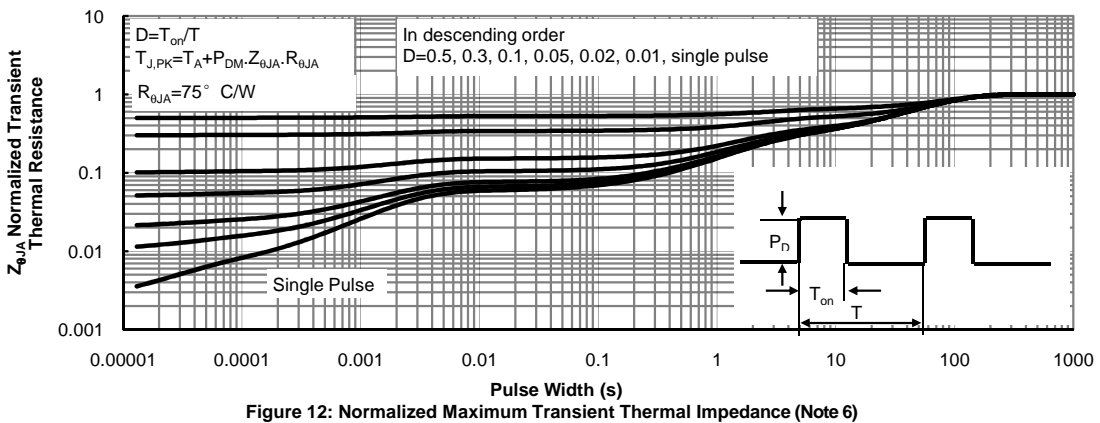
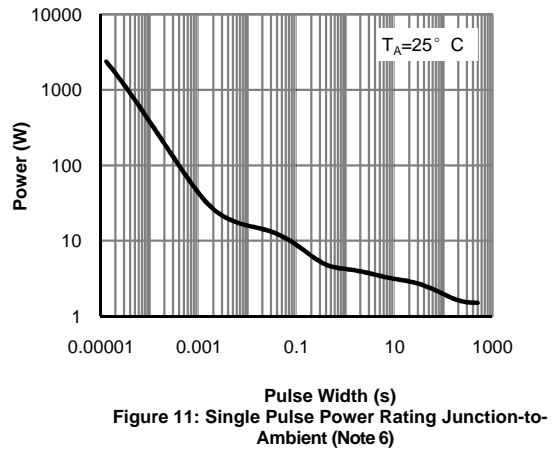
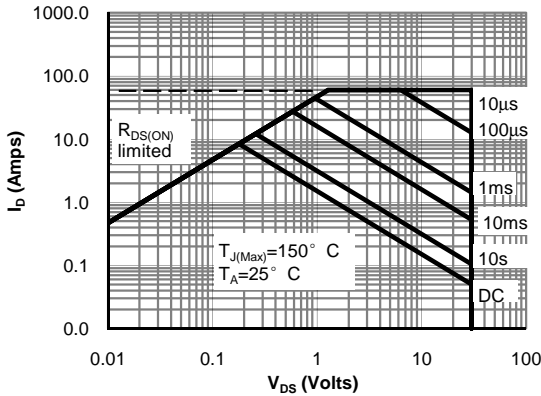
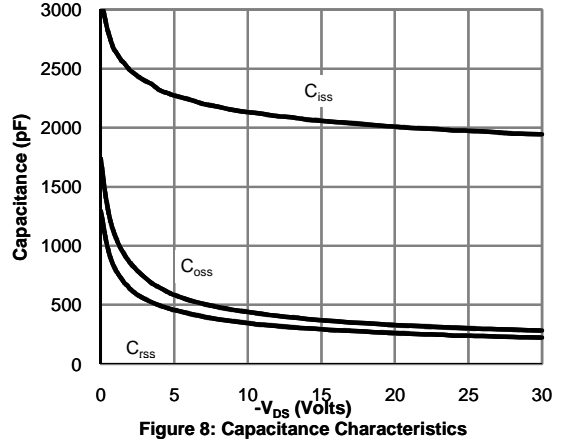
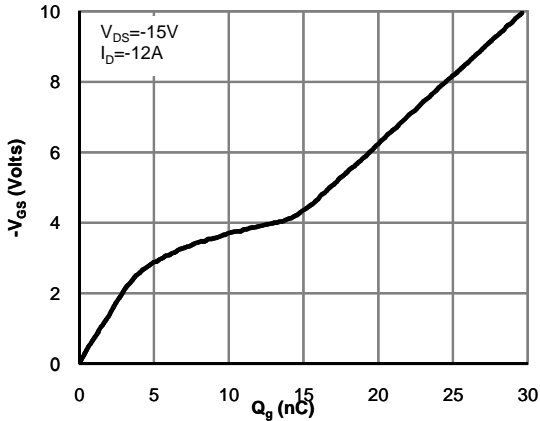
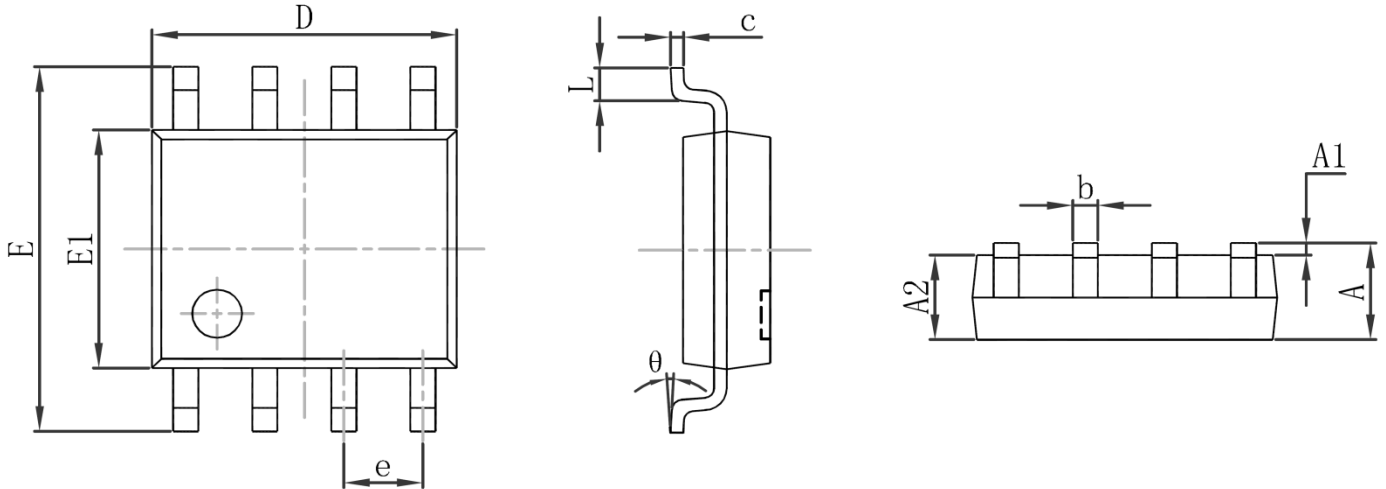


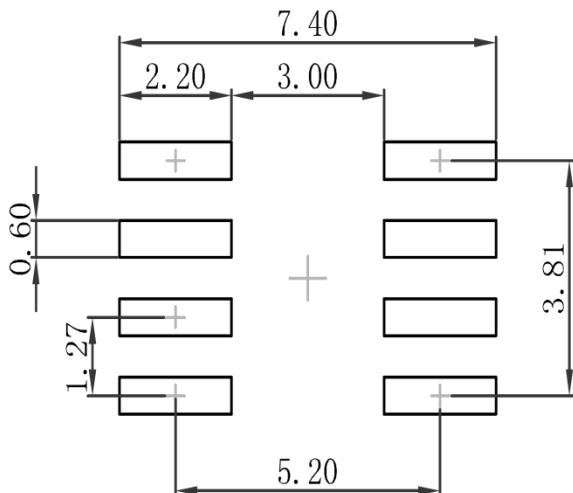
Figure 6: Body-Diode Characteristics (Note 5)

P-CHANNEL ENHANCEMENT MODE MOSFET

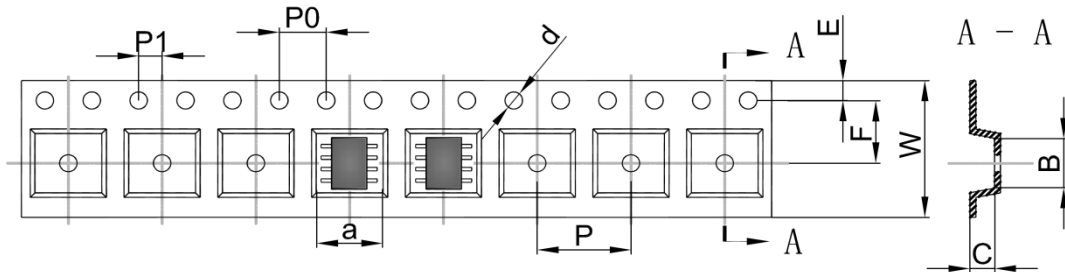


P-CHANNEL ENHANCEMENT MODE MOSFET
SOP-8 Package Outline Dimensions


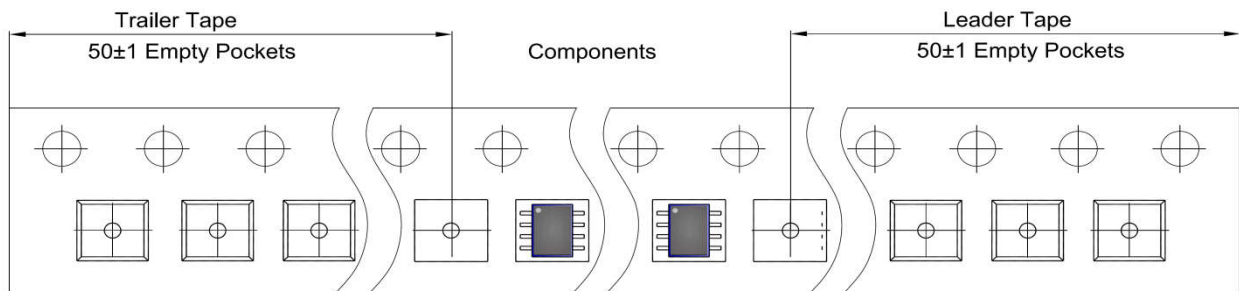
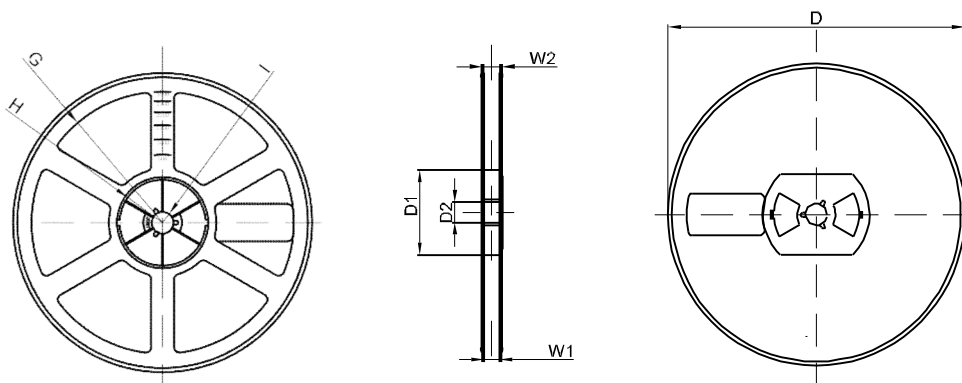
Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	1.350	1.750	0.053	0.069
A1	0.100	0.250	0.004	0.010
A2	1.350	1.550	0.053	0.061
b	0.330	0.510	0.013	0.020
c	0.170	0.250	0.007	0.010
D	4.800	5.000	0.189	0.197
e	1.270(BSC)		0.050 (BSC)	
E	5.800	6.200	0.228	0.244
E1	3.800	4.000	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: $\pm 0.05\text{mm}$
3. The pad layout is for reference purposes only

P-CHANNEL ENHANCEMENT MODE MOSFET
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