

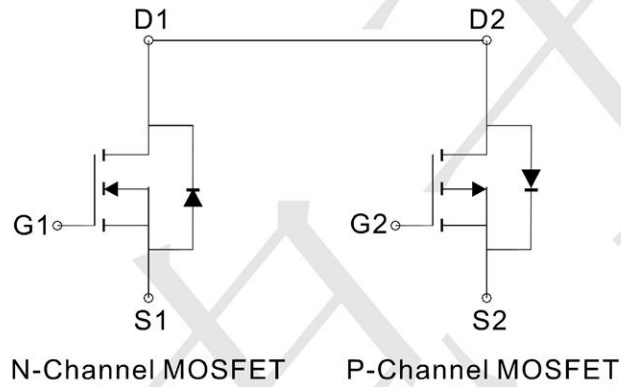
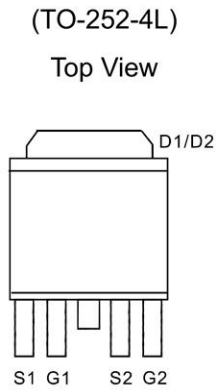
FEATURES

- $R_{DS(ON)} = 15m\Omega @ V_{GS}=10V$ (N-Ch)
- $R_{DS(ON)} \leq 36m\Omega @ V_{GS}=-4.5V$ (P-Ch)

Application

- Motor/Body Load Control
- Load Switch
- PWM Application
- DC-DC converters and Off-line UPS

PIN CONFIGURATION



Marking: 3012

Absolute Maximum Ratings (at $T_a = 25^\circ C$ unless otherwise specified)

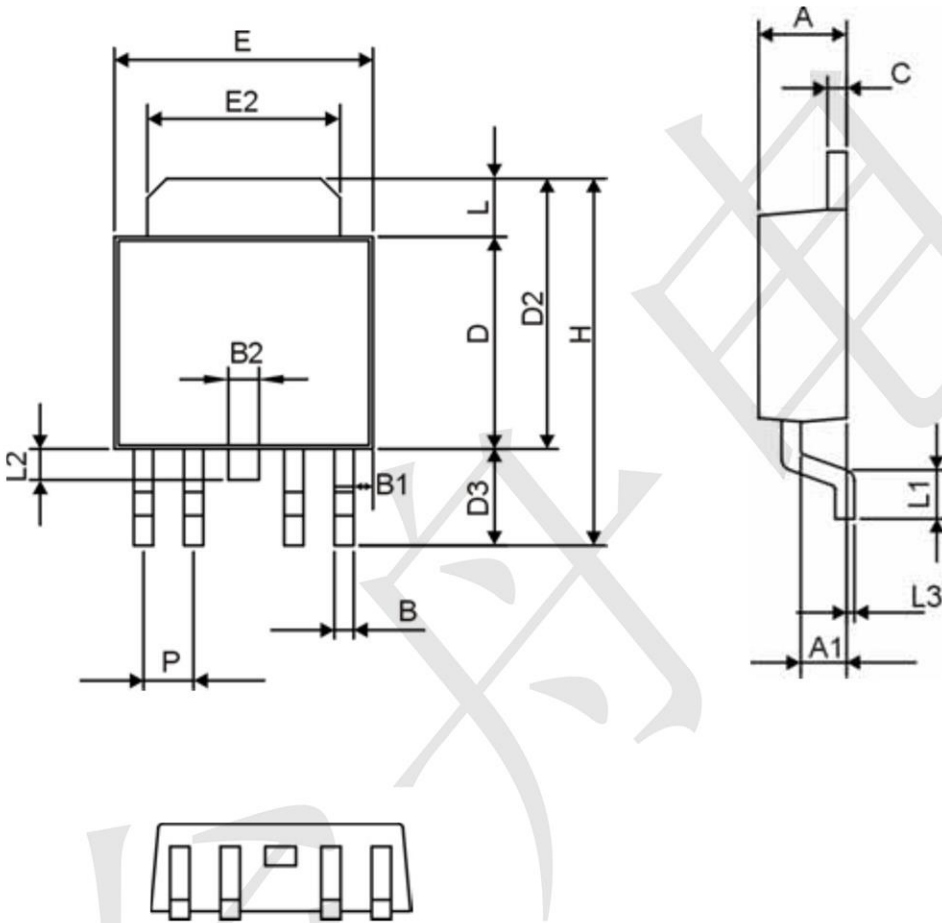
Parameter	Symbol	N-Channel	P-Channel	Unit	
Drain-Source Voltage	V_{DSS}	30	-30	V	
Gate-Source Voltage	V_{GSS}	± 20	± 20	V	
Pulsed Drain Current	I_D	$T_C=25^\circ C$	22.1	-18.6	A
			30	-30	A
Maximum Power Dissipation	P	20	20	W	
Operating Junction Temperature	T_J	-55 to 150		$^\circ C$	

Electrical Characteristics (at Ta = 25°C unless otherwise specified)

Symbol	Parameter	Test Condition	Min.	Typ.	Max.	Units
Off Characteristic						
$V_{(BR)DSS}$	Drain-Source Breakdown Voltage	$V_{GS}=0V, I_D=250\mu A$	30	-	-	V
I_{DSS}	Zero Gate Voltage Drain Current	$V_{DS}=30V, V_{GS}=0V,$	-	-	1.0	μA
I_{GSS}	Gate to Body Leakage Current	$V_{DS}=0V, V_{GS}=\pm 20V$	-	-	± 100	nA
On Characteristics						
$V_{GS(th)}$	Gate Threshold Voltage	$V_{DS}=V_{GS}, I_D=250\mu A$	1.0	1.5	2.5	V
$R_{DS(on)}$	Static Drain-Source on-Resistance note3	$V_{GS}=10V, I_D=5A$	-	15	20	m Ω
		$V_{GS}=4.5V, I_D=3A$	-	21	29	
Dynamic Characteristics						
C_{iss}	Input Capacitance	$V_{DS}=15V, V_{GS}=0V,$ $f=1.0MHz$	-	490	-	pF
C_{oss}	Output Capacitance		-	79	-	pF
C_{rss}	Reverse Transfer Capacitance		-	61	-	pF
Q_g	Total Gate Charge	$V_{DS}=15V, I_D=5.8A,$ $V_{GS}=10V$	-	10	-	nC
Q_{gs}	Gate-Source Charge		-	1.7	-	nC
Q_{gd}	Gate-Drain("Miller") Charge		-	2.5	-	nC
Switching Characteristics						
$t_{d(on)}$	Turn-on Delay Time	$V_{DS}=15V, I_D=3A,$ $V_{GS}=10V, R_{REN}=3\Omega$	-	6	-	ns
t_r	Turn-on Rise Time		-	15	-	ns
$t_{d(off)}$	Turn-off Delay Time		-	17	-	ns
t_f	Turn-off Fall Time		-	17	-	ns
Drain-Source Diode Characteristics and Maximum Ratings						
I_S	Maximum Continuous Drain to Source Diode Forward Current		-	-	12	A
I_{SM}	Maximum Pulsed Drain to Source Diode Forward Current		-	-	30	A
V_{SD}	Drain to Source Diode Forward Voltage	$V_{GS}=0V, I_S=9A$	-	-	1.2	V
t_{rr}	Body Diode Reverse Recovery Time	$I_F=5A, dI/dt=100A/\mu s$	-	7	-	ns
Q_{rr}	Body Diode Reverse Recovery Charge		-	2	-	nC

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Static Characteristics						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	$V_{GS} = 0V, I_D = -250\mu A$	-30	-	-	V
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS} = -30V, V_{GS} = 0V$	-	-	-1	μA
Gate-Source Leakage	I_{GSS}	$V_{DS} = 0V, V_{GS} = \pm 20V$	-	-	± 100	nA
Gate-Source Threshold voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = -250\mu A$	-1	-1.5	-2.5	V
Drain-Source on-State Resistance ³	$R_{DS(on)}$	$V_{GS} = -10V, I_D = -4.1A$	-	36	52	m Ω
		$V_{GS} = -4.5V, I_D = -3A$	-	49	75	
Dynamic Characteristics⁴						
Input Capacitance	C_{iss}	$V_{GS} = 0V, V_{DS} = -15V,$ $f = 1.0MHz$	-	530	-	pF
Output Capacitance	C_{oss}		-	70	-	
Reverse Transfer Capacitance	C_{rss}		-	56	-	
Switching Characteristics⁴						
Total Gate Charge	Q_g	$V_{GS} = -10V, V_{DS} = -15V,$ $I_D = -4.1A$	-	6.8	-	nC
Gate-Source Charge	Q_{gs}		-	1.0	-	
Gate-Drain Charge	Q_{gd}		-	1.4	-	
Turn-on Delay Time	$t_{d(on)}$	$V_{GS} = -10V, V_{DS} = -15V,$ $R_L = 15\Omega, R_{GEN} = 2.5\Omega$	-	14	-	ns
Rise Time	t_r		-	61	-	
Turn-off Delay time	$t_{d(off)}$		-	19	-	
Fall Time	t_f		-	10	-	
Source-Drain Body Diode Characteristics						
Diode Forward Voltage ³	V_{SD}	$I_S = -4.1A, V_{GS} = 0V$	-	-	-1.2	V
Continuous Source Current	I_S		-	-	-12	A

Package Outline Dimensions TO-252-4L Package



DIM	MILLIMETERS (mm)	
	MIN	MAX
A	2.20	2.50
A1	1.10	1.30
B	0.30	0.75
B1	0.55	0.75
B2	0.40	0.80
C	0.40	0.60
D	5.20	5.70
D2	6.50	7.30
D3	2.20	3.00
E	6.30	6.70
E2	4.50	5.50
H	9.50	10.50
L	1.30	1.70
L1	0.90	1.70
L2	0.50	1.10
L3	0.00	0.30
P	1.20	1.40