

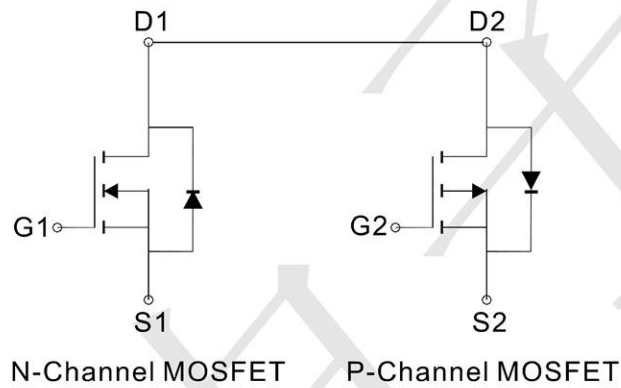
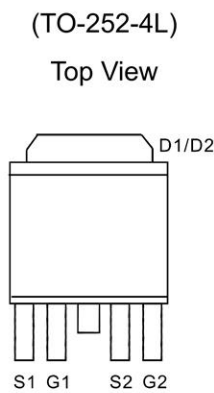
FEATURES

- $R_{DS(ON)} \leq 17m\Omega @ V_{GS}=10V$ (N-Ch)
- $R_{DS(ON)} \leq 58m\Omega @ V_{GS}=4.5V$ (N-Ch)
- $R_{DS(ON)} \leq 32m\Omega @ V_{GS}=-10V$ (P-Ch)
- $R_{DS(ON)} \leq 75m\Omega @ V_{GS}=-4.5V$ (P-Ch)

Application

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

PIN CONFIGURATION



Marking: 4012

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

Parameter		Symbol	N-Channel	P-Channel	Unit		
Drain-Source Voltage		V_{DSS}	40	-40	V		
Gate-Source Voltage		V_{GSS}	± 25	± 25	V		
Continuous Drain Current($T_j=150^\circ C$)*	$T_c=25^\circ C$	I_D	22.1	-18.6	A		
	$T_c=70^\circ C$		17.7	-14.9			
	$T_A=25^\circ C$		7.4	-6.1			
	$T_A=70^\circ C$		5.9	-5			
Pulsed Drain Current		I_{DM}	30	-30	A		
Maximum Power Dissipation	$T_A=25^\circ C$	P_D	2.6	2.7	W		
	$T_A=70^\circ C$		1.67	1.7			
Operating Junction Temperature		T_J	-55 to 150		$^\circ C$		
Thermal Resistance-Junction to Ambient*		$R_{\theta JA}$	Steady	48	Steady	46	$^\circ C/W$
			10sec	20	10sec	18	
Thermal Resistance-Junction to Case*		$R_{\theta JC}$	5.3		5	$^\circ C/W$	

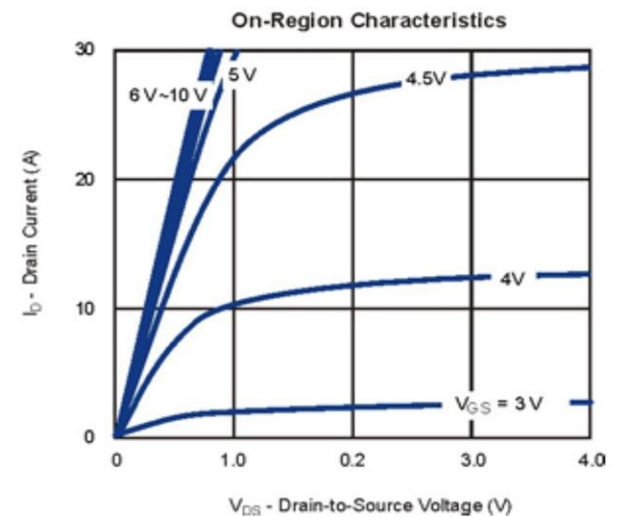
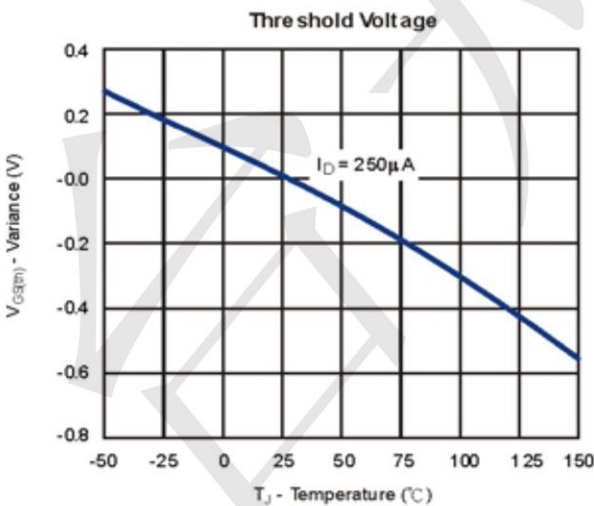
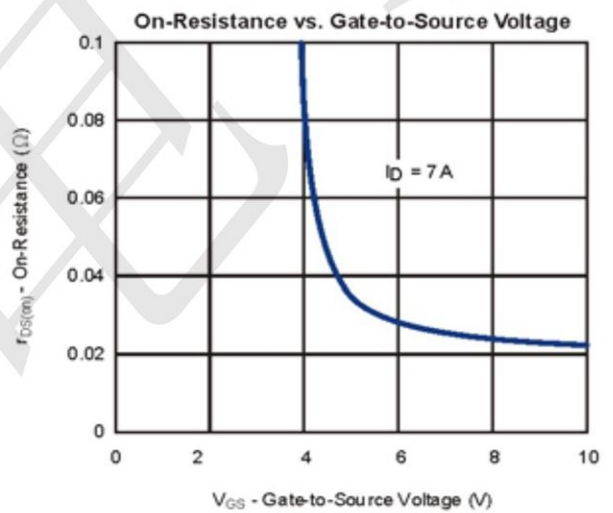
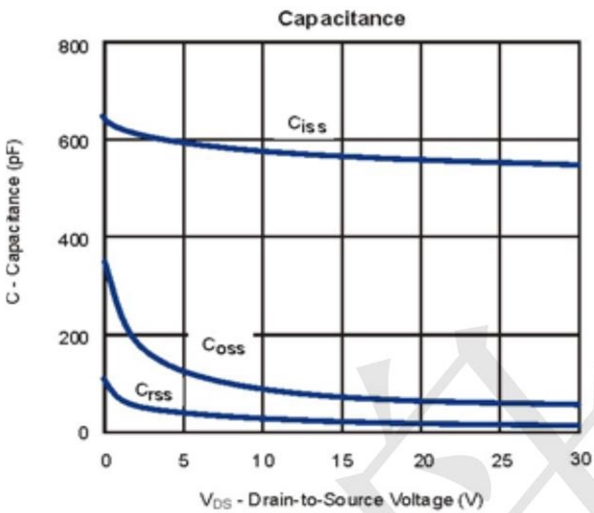
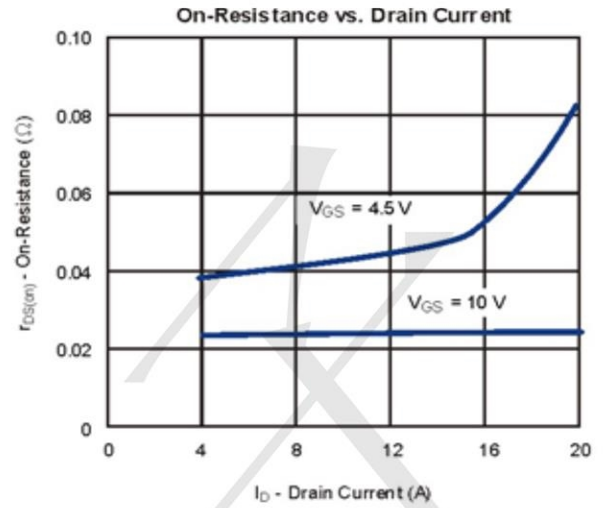
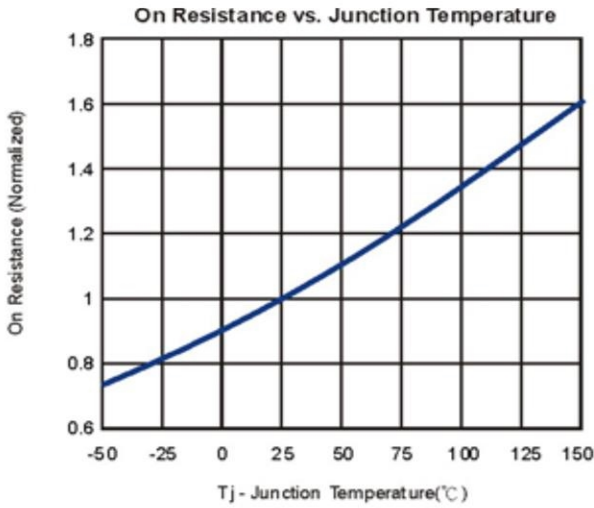
Electrical Characteristics (at Ta = 25°C unless otherwise specified)

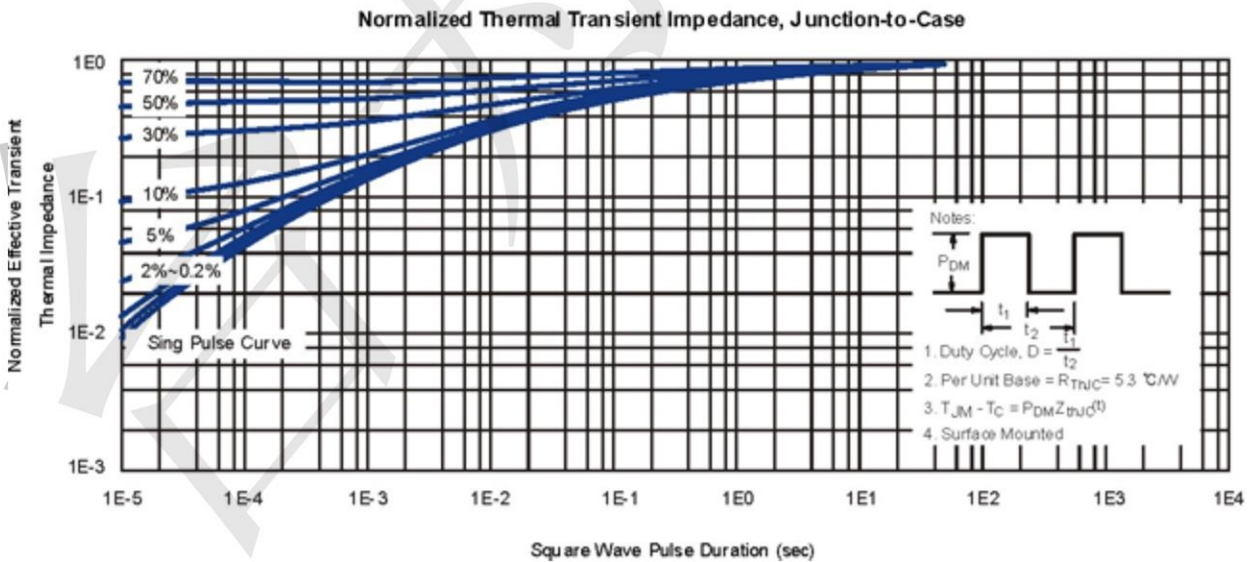
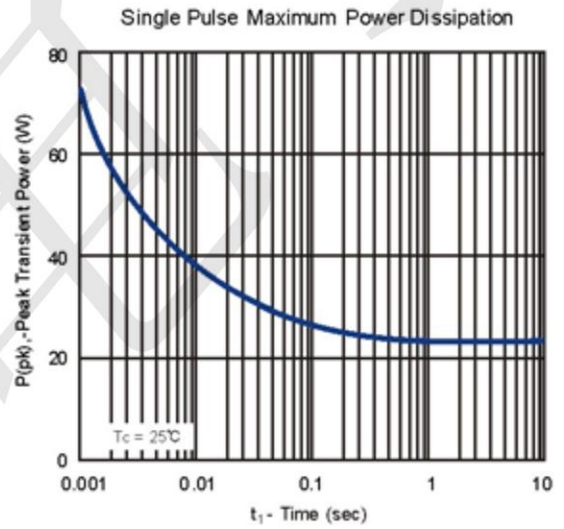
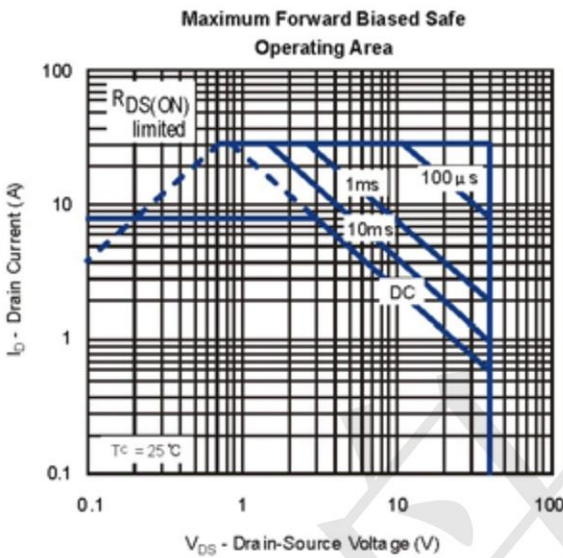
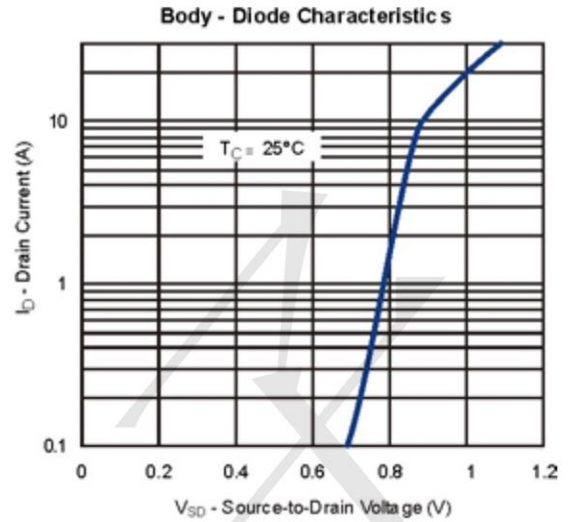
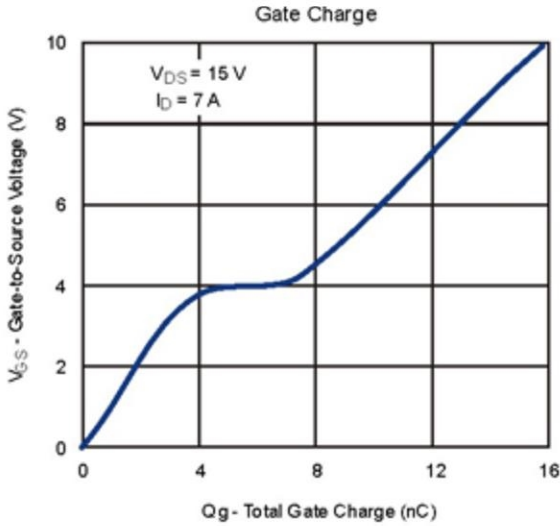
Symbol	Parameter	Limit	Min	Typ	Max	Unit	
STATIC							
V _{(BR)DSS}	Drain-Source Breakdown Voltage	V _{GS} =0V, I _D =250 μA V _{GS} =0V, I _D =250 μA	N-Ch P-Ch	40 -40		V	
V _{GS(th)}	Gate Threshold Voltage	V _{DS} =V _{GS} , I _D =250 μA V _{DS} =V _{GS} , I _D =-250 μA	N-Ch P-Ch	1 -1	1.5 -1.5	3 -3	V
I _{GSS}	Gate Leakage Current	V _{DS} =0V, V _{GS} =±25V V _{DS} =0V, V _{GS} =±25V	N-Ch P-Ch			±100 ±100	nA
I _{DSS}	Zero Gate Voltage Drain Current	V _{DS} =40V, V _{GS} =0V V _{DS} =-40V, V _{GS} =0V	N-Ch P-Ch			1 -1	μA
		V _{DS} =40V, V _{GS} =0V, T _J =55°C V _{DS} =-40V, V _{GS} =0V, T _J =55°C	N-Ch P-Ch			10 -10	
R _{DS(ON)}	Drain-Source On-State Resistance ^a	V _{GS} =10V, I _D = 7A V _{GS} =-10V, I _D = -7A	N-Ch P-Ch		17 32	30 45	mΩ
		V _{GS} =4.5V, I _D = 6A V _{GS} =-4.5V, I _D = -6A	N-Ch P-Ch		42 58	58 75	
V _{SD}	Diode Forward Voltage	I _S =1.7A, V _{GS} =0V I _S =-1.7A, V _{GS} =0V	N-Ch P-Ch		0.7 -0.7	1.2 -1.2	V
DYNAMIC							
Q _g	Total Gate Charge	N-Channel V _{DS} =20V, V _{GS} =4.5V, I _D =7A P-Channel V _{DS} =-20V, V _{GS} =-4.5V, I _D =-7A	N-Ch P-Ch		8 10		nC
Q _{gs}	Gate-Source Charge		N-Ch P-Ch		4 4.3		
Q _{gd}	Gate-Drain Charge		N-Ch P-Ch		4 4.5		
R _g	Gate Resistance	V _{GS} =0V, V _{DS} =0V, f=1MHz V _{GS} =0V, V _{DS} =0V, f=1MHz	N-Ch P-Ch		0.7 6		Ω
C _{iss}	Input capacitance	N-Channel V _{DS} =20V, V _{GS} =0V, F=1MHz P-Channel V _{DS} =-20V, V _{GS} =0V, F=1MHz	N-Ch P-Ch		560 860		pF
C _{oss}	Output Capacitance		N-Ch P-Ch		72 120		
C _{rss}	Reverse Transfer Capacitance		N-Ch P-Ch		18 35		
t _{d(on)}	Turn-On Delay Time	N-Channel V _{DD} =15V, R _L =15 Ω I _D =1A, V _{GEN} =10V, R _G =6 Ω P-Channel V _{DD} =-15V, R _L =15 Ω I _D =-1A, V _{GEN} =-10V, R _G =6 Ω	N-Ch P-Ch		11 30		ns
t _r	Turn-On Rise Time		N-Ch P-Ch		13 8.5		
t _{d(off)}	Turn-Off Delay Time		N-Ch P-Ch		37 70		
t _f	Turn-On Fall Time		N-Ch P-Ch		3.5 7		

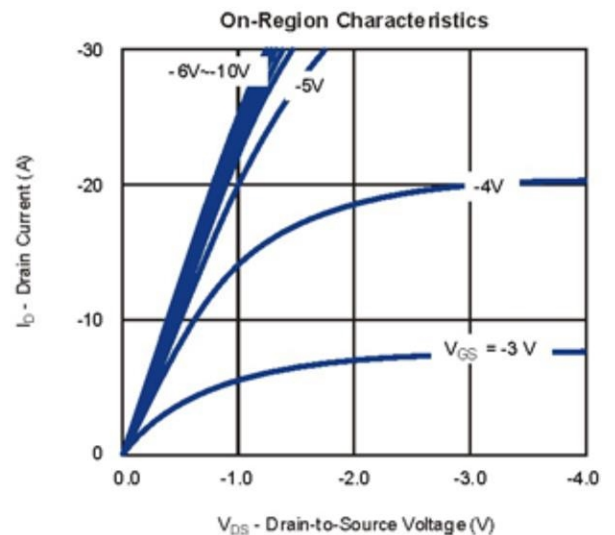
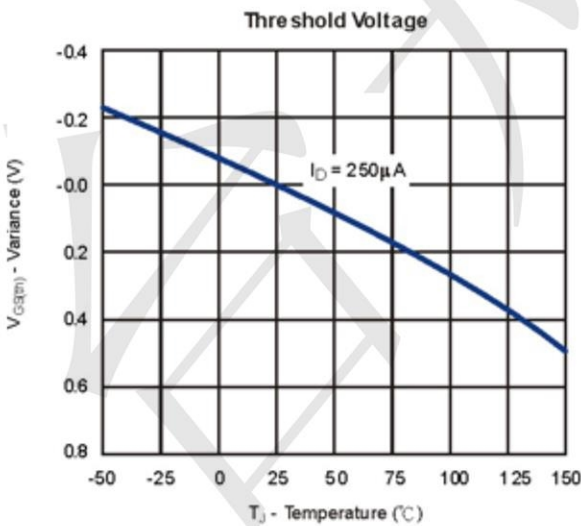
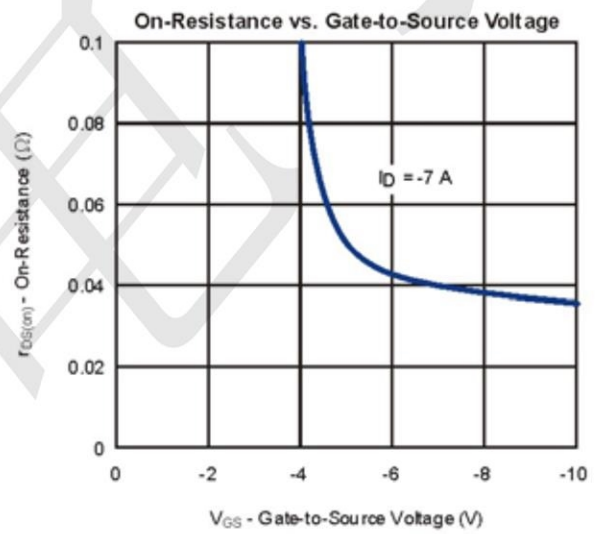
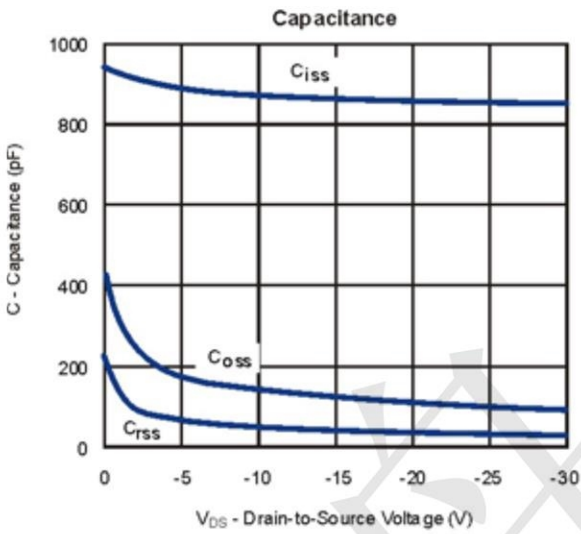
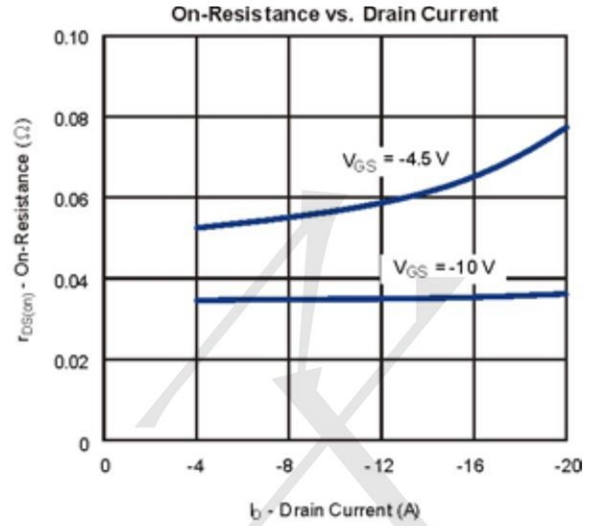
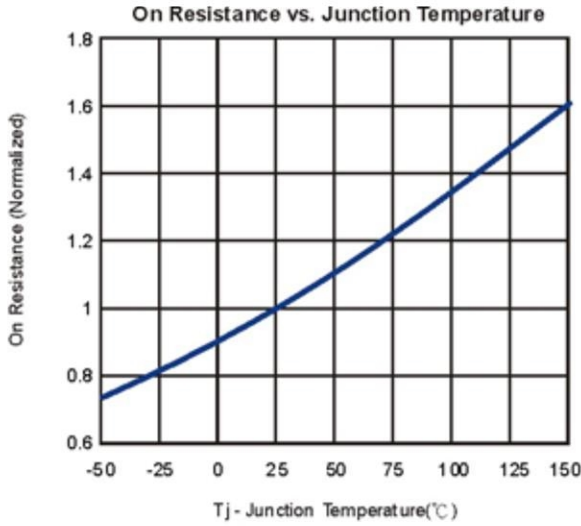
Notes: a. Pulse test; pulse width ≤ 300us, duty cycle ≤ 2%

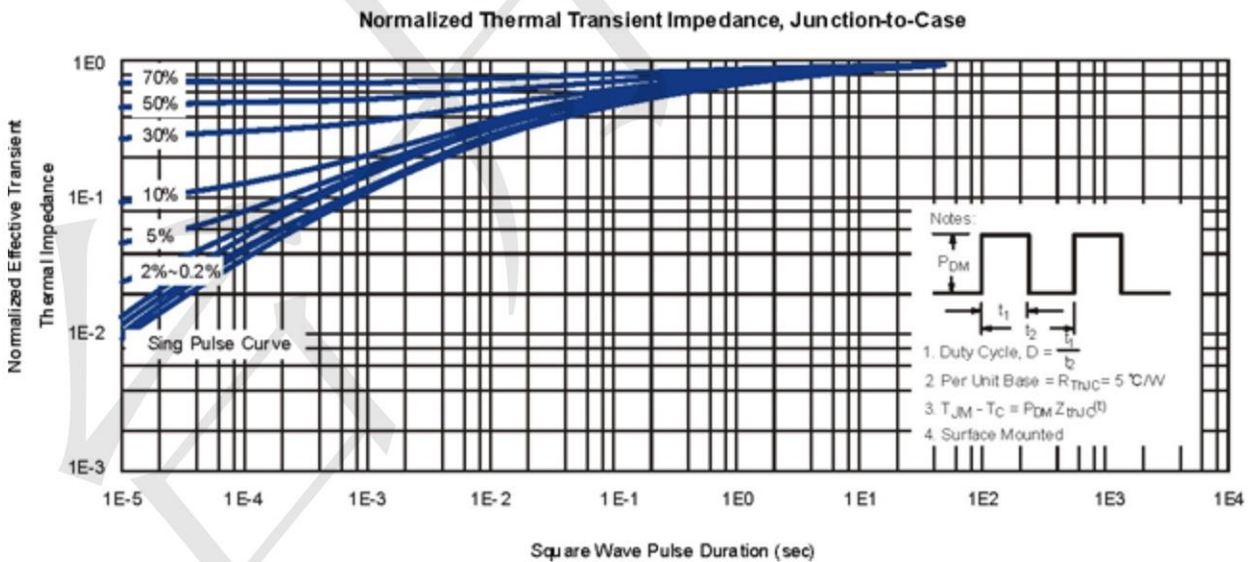
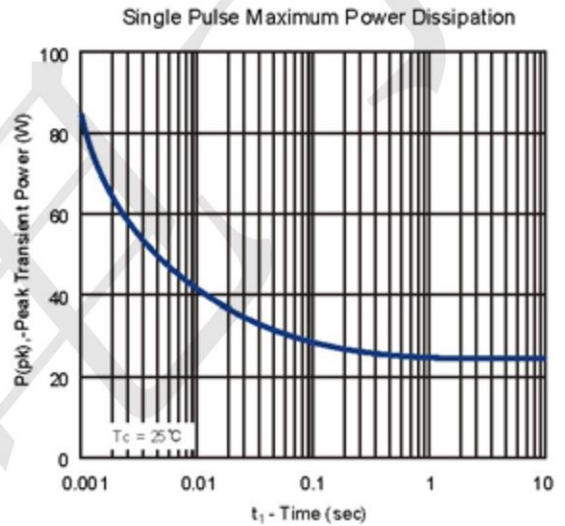
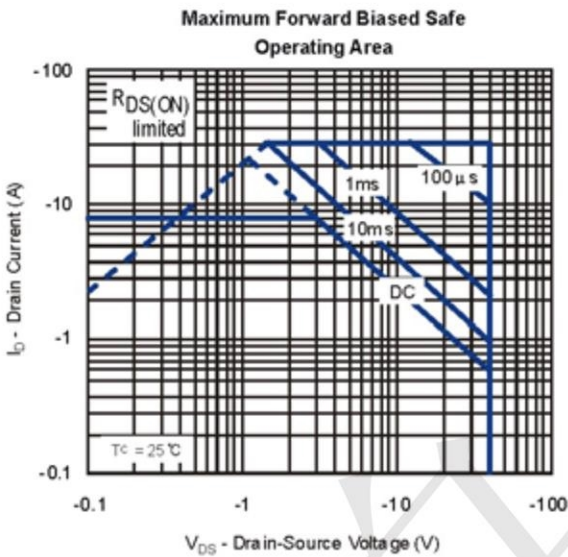
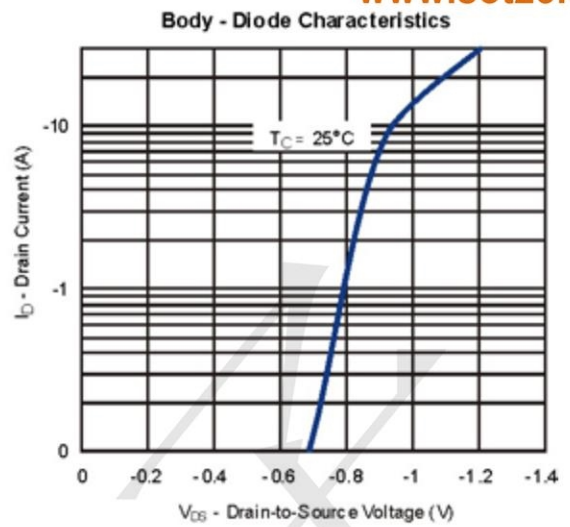
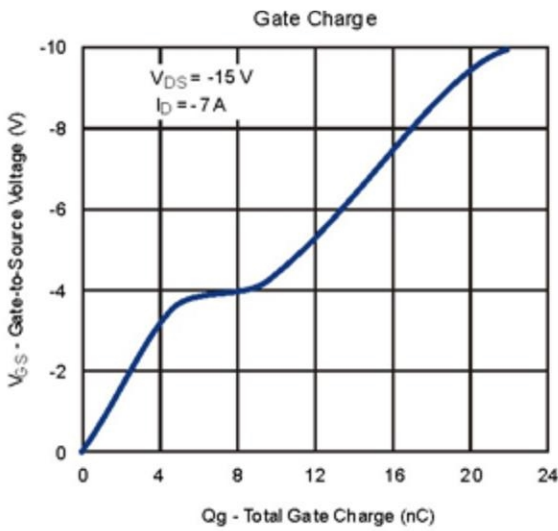


Typical Characteristics



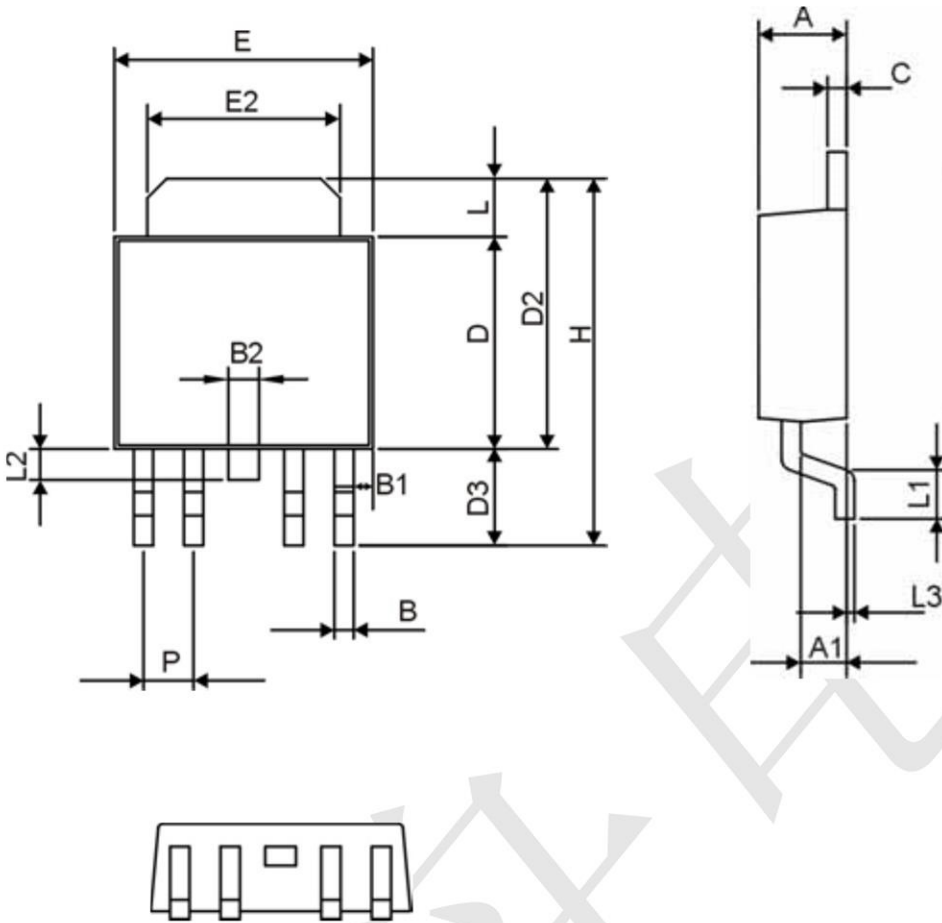








Package Outline Dimensions TO-252-4L Package



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

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