



YOUSHANG SEMICONDUCTOR

设计研发新型功率器件

各类小信号开关

中低压及高压大电流等场效应管

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企业微信二维码



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Product Summary

BV_{DSS}	$R_{DS(ON)}$	I_D $T_A = +25^\circ C$
40V	30m Ω @ $V_{GS} = 10V$	9.6A
	50m Ω @ $V_{GS} = 4.5V$	7.4A

Features and Benefits

- Low On-Resistance
- Fast Switching Speed

Description and Applications

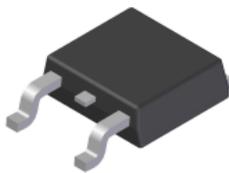
This MOSFET is designed to meet the stringent requirements of automotive applications. It is qualified to AEC-Q101, supported by a PPAP and is ideal for use in:

- Backlighting
- DC-DC Converters
- Power Management Functions

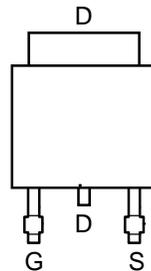
Mechanical Data

- Case: TO252
- Case Material: Molded Plastic, "Green" Molding Compound. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Matte Tin Finish Annealed over Copper Leadframe. Solderable per MIL-STD-202, Method 208 e3
- Weight: 0.33 grams (Approximate)

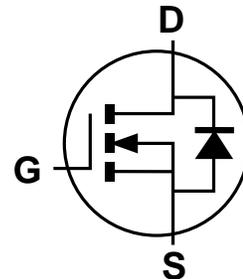
TO252 (DPAK)



Top View



Top View
Pin-Out



Equivalent Circuit

Maximum Ratings (@T_A = +25°C, unless otherwise specified.)

Characteristic			Symbol	Value	Unit
Drain-Source Voltage			V _{DSS}	40	V
Gate-Source Voltage			V _{GSS}	±20	V
Continuous Drain Current (Note 5) V _{GS} = 10V	Steady State	T _A = +25°C	I _D	9.6	A
		T _A = +70°C		7.7	
Maximum Body Diode Continuous Current (Note 5)			I _S	9.6	A
Pulsed Drain Current (10μs Pulse, Duty Cycle = 1%) (Note 6)			I _{DM}	37.7	A
Pulsed Source Current (10μs Pulse, Duty Cycle = 1%) (Note 6)			I _{SM}	37.7	A

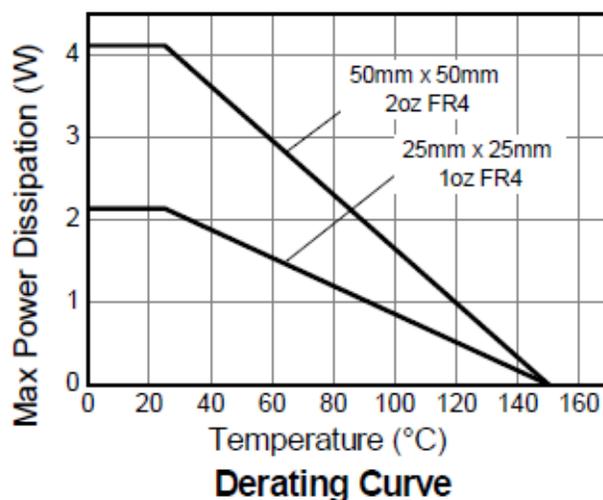
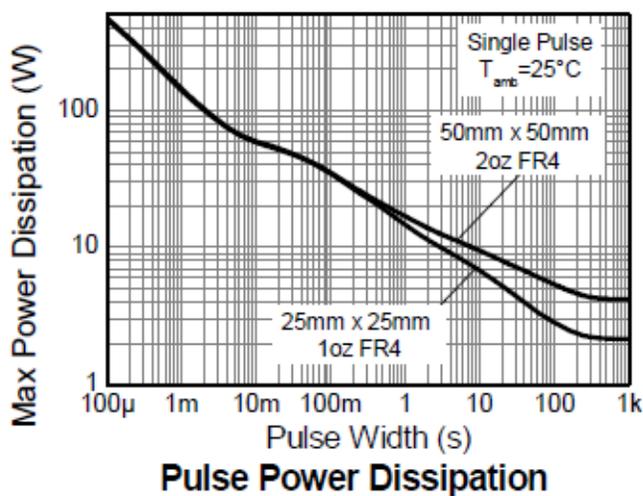
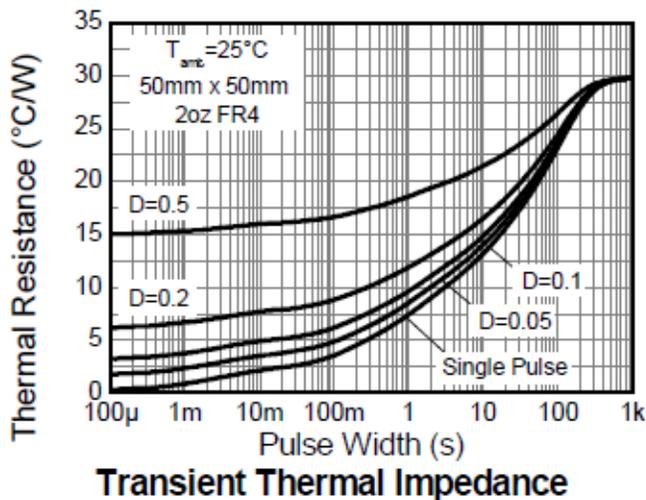
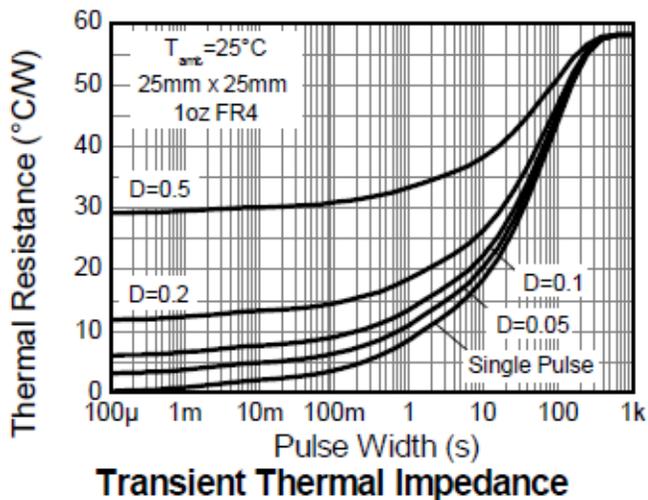
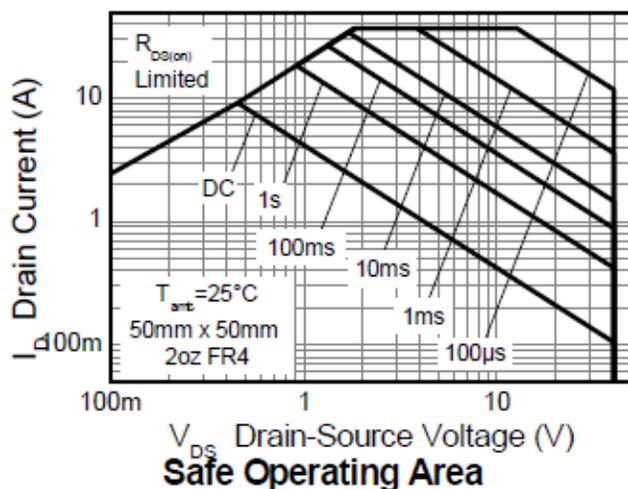
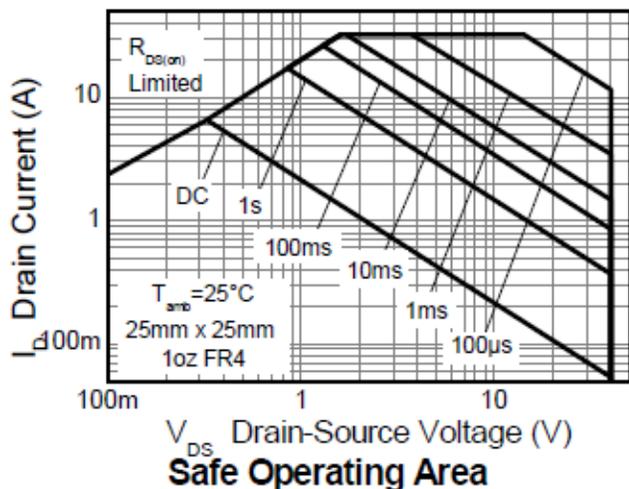
Thermal Characteristics (@T_A = +25°C, unless otherwise specified.)

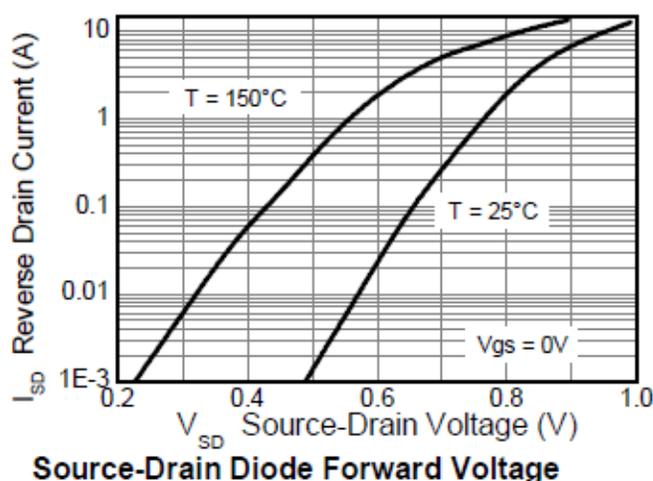
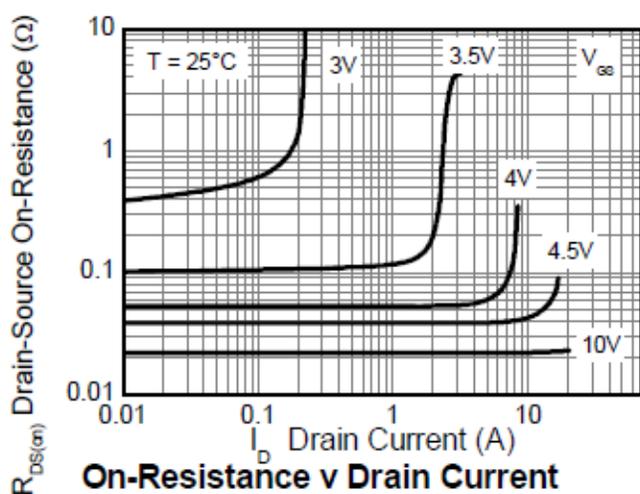
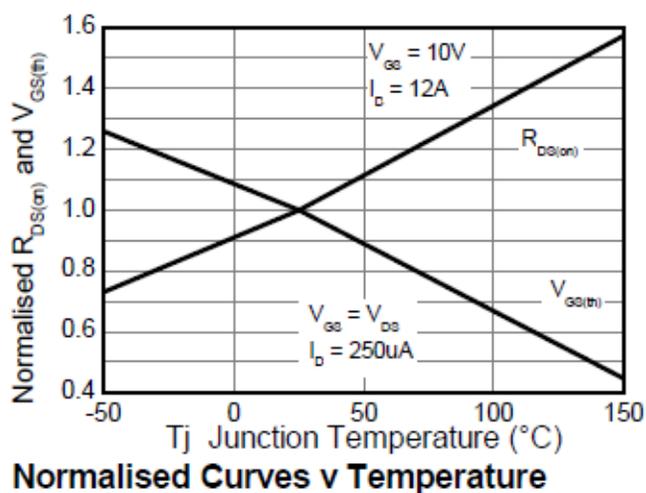
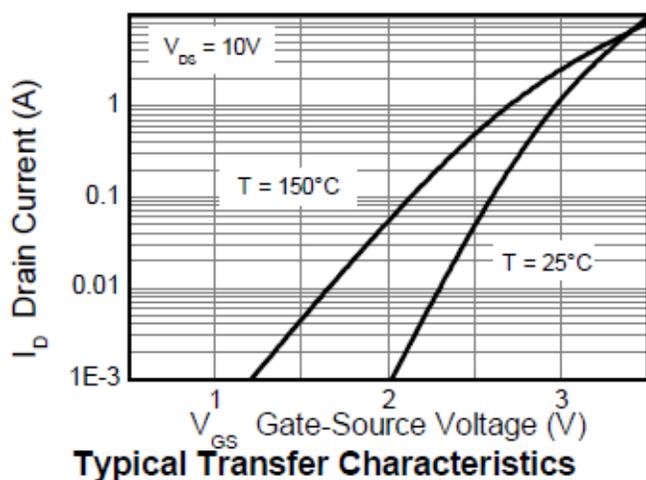
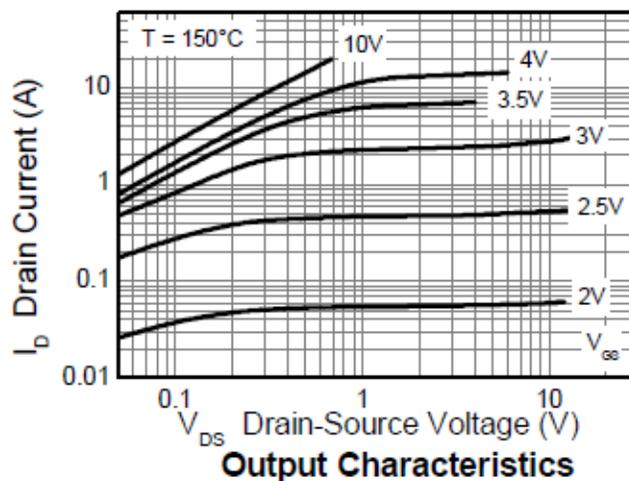
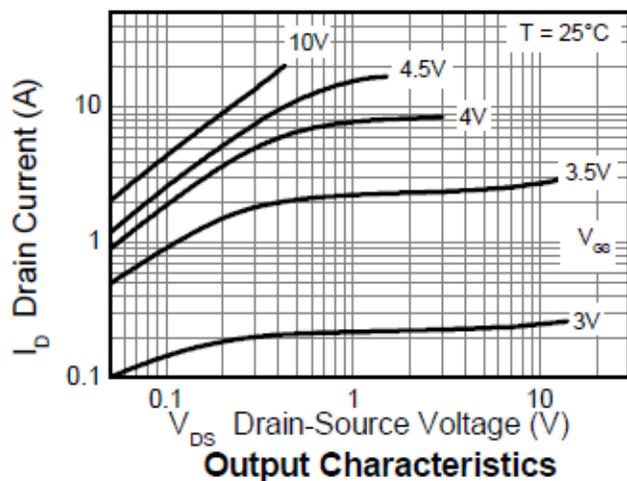
Characteristic		Symbol	Value	Unit
Total Power Dissipation (Note 5)	T _A = +25°C	P _D	4.18	W
Thermal Resistance, Junction to Ambient (Note 5)	Steady State	R _{θJA}	29.9	°C/W
Total Power Dissipation (Note 7)	T _A = +25°C	P _D	2.14	W
Thermal Resistance, Junction to Ambient (Note 7)	Steady State	R _{θJA}	58.4	°C/W
Thermal Resistance, Junction to Case (Note 8)		R _{θJC}	2.46	°C/W
Operating and Storage Temperature Range		T _J , T _{STG}	-55 to +150	°C

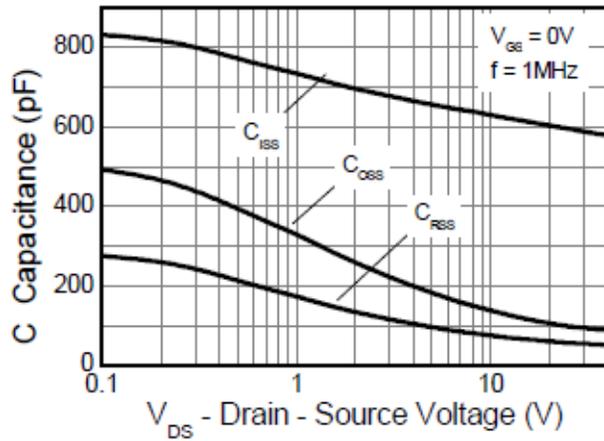
Electrical Characteristics (@T_A = +25°C, unless otherwise specified.)

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
OFF CHARACTERISTICS (Note 9)						
Drain-Source Breakdown Voltage	BV _{DSS}	40	—	—	V	V _{GS} = 0V, I _D = 250μA
Zero Gate Voltage Drain Current	I _{DSS}	—	—	1	μA	V _{DS} = 40V, V _{GS} = 0V
Gate-Source Leakage	I _{GSS}	—	—	±100	nA	V _{GS} = ±20V, V _{DS} = 0V
ON CHARACTERISTICS (Note 9)						
Gate Threshold Voltage	V _{GS(TH)}	1	—	3	V	V _{DS} = V _{GS} , I _D = 250μA
Static Drain-Source On-Resistance	R _{DS(ON)}	—	21	30	mΩ	V _{GS} = 10V, I _D = 12A
		—	37	50		V _{GS} = 4.5V, I _D = 6A
Diode Forward Voltage	V _{SD}	—	0.95	1.1	V	V _{GS} = 0V, I _S = 12A
DYNAMIC CHARACTERISTICS (Note 10)						
Input Capacitance	C _{iss}	—	604	—	pF	V _{DS} = 20V, V _{GS} = 0V, f = 1.0MHz
Output Capacitance	C _{oss}	—	106	—		
Reverse Transfer Capacitance	C _{rss}	—	59.6	—		
Total Gate Charge (V _{GS} = 4.5V)	Q _g	—	6.5	—	nC	V _{DS} = 20V, I _D = 12A
Total Gate Charge (V _{GS} = 10V)	Q _g	—	12.9	—		
Gate-Source Charge	Q _{gs}	—	2.3	—		
Gate-Drain Charge	Q _{gd}	—	3.6	—		
Turn-On Delay Time	t _{D(ON)}	—	4.2	—	ns	V _{DD} = 20V, I _D = 12A V _{GS} = 10V, R _G = 6Ω
Turn-On Rise Time	t _R	—	12.4	—		
Turn-Off Delay Time	t _{D(OFF)}	—	13.8	—		
Turn-Off Fall Time	t _F	—	10.7	—		
Body Diode Reverse Recovery Time	t _{RR}	—	135	—	ns	I _F = 12A, di/dt = 100A/μs
Body Diode Reverse Recovery Charge	Q _{RR}	—	799	—	nC	I _F = 12A, di/dt = 100A/μs

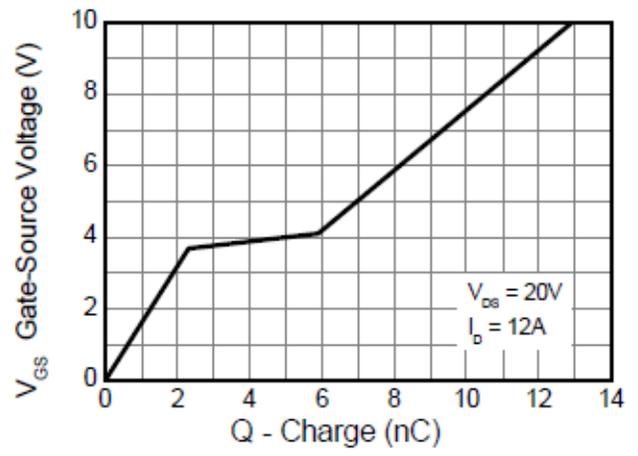
- Notes:
- For a device surface mounted on 50mm x 50mm x 1.6mm FR-4 PCB with high coverage of single sided 2oz copper, in still air conditions; the device is measured when operating in a steady-state condition.
 - Same as note 5, except the device is pulsed with D = 0.02 and pulse width 300μs. The pulse current is limited by the maximum junction temperature.
 - For a device surface mounted on 25mm x 25mm x 1.6mm FR-4 PCB with high coverage of single sided 1oz copper, in still air conditions; the device is measured when operating in a steady-state condition.
 - Thermal resistance from junction to solder-point (at the end of the drain lead).
 - Short duration pulse test used to minimize self-heating effect.
 - Guaranteed by design. Not subject to product testing.







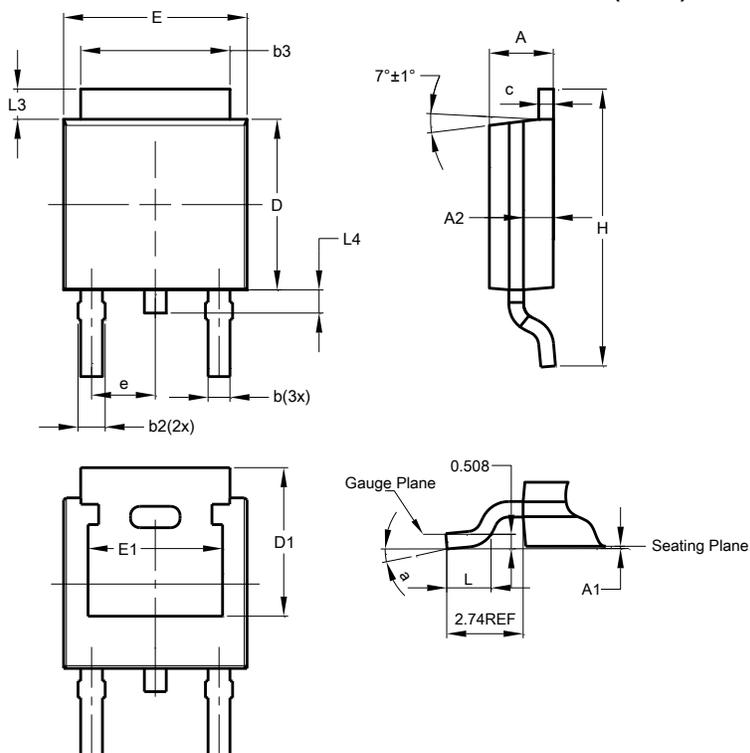
Capacitance v Drain-Source Voltage



Gate-Source Voltage v Gate Charge

Package Outline Dimensions

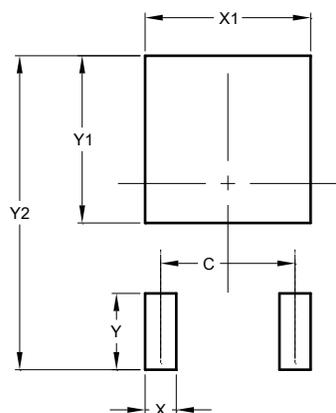
TO252 (DPAK)



TO252 (DPAK)			
Dim	Min	Max	Typ
A	2.19	2.39	2.29
A1	0.00	0.13	0.08
A2	0.97	1.17	1.07
b	0.64	0.88	0.783
b2	0.76	1.14	0.95
b3	5.21	5.46	5.33
c	0.45	0.58	0.531
D	6.00	6.20	6.10
D1	5.21	-	-
e	-	-	2.286
E	6.45	6.70	6.58
E1	4.32	-	-
H	9.40	10.41	9.91
L	1.40	1.78	1.59
L3	0.88	1.27	1.08
L4	0.64	1.02	0.83
a	0°	10°	-
All Dimensions in mm			

Suggested Pad Layout

TO252 (DPAK)



Dimensions	Value (in mm)
C	4.572
X	1.060
X1	5.632
Y	2.600
Y1	5.700
Y2	10.700