

Product Summary

- V_{DS} -40 V
- I_{DS} -40A
- $R_{DS(ON)}$ (at $V_{GS} = -10V$) 15mΩ(Typ)

Application

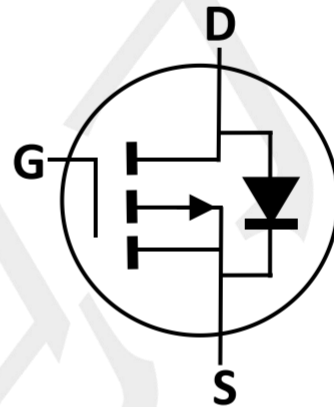
- Reverse Battery protection
- Load switch
- Power management
- PWM Application

Package and Pin Configuration



TO-252

Circuit diagram



Equivalent Circuit

Absolute Maximum Ratings ($T_C = 25^\circ\text{C}$ unless otherwise noted)

PARAMETER	SYMBOL	LIMIT	UNIT
Drain-Source Voltage	V_{DS}	-40	V
Gate-Source Voltage	V_{GS}	± 20	V
Continuous Drain Current, $T_C = 25^\circ\text{C}$	I_D	-40	A
Continuous Drain Current, $T_C = 100^\circ\text{C}$	I_D	-28	A
Pulsed Drain Current (note1)	I_{DM}	-50	A
Maximum Power Dissipation	P_D	62	W
Operating Junction Temperature Range	T_J	150	$^\circ\text{C}$
Storage Temperature Range	T_{stg}	-55 to +150	$^\circ\text{C}$

Thermal Characteristic

PARAMETER	Symbol	Value	Unit
Thermal Resistance from Junction to Ambient($t \leq 10s$)	$R_{\theta JA}$	20	$^\circ\text{C/W}$
Maximum Junction-to-Case			
	$R_{\theta JC}$	2.4	$^\circ\text{C/W}$

notes 1. Repetitive Rating: Pulse width limited by maximum junction temperature.

2. When mounted on 1" square PCB (FR4 material).

Electrical Characteristics (T_A=25°C unless otherwise noted)

PARAMETER	CONDITIONS	SYMBOL	MIN	TYP	MAX	UNIT
Static						
Drain-Source Breakdown Voltage	V _{GS} =0V, I _D =-250μA	BV _{DSS}	-40	--	--	V
Gate-Source Threshold Voltage	V _{DS} =V _{GS} , I _D = -250μA	V _{GS(th)}	-1.7	-1.9	-3.0	V
Gate-Source Leakage	V _{DS} =0V, V _{GS} = ±20V	I _{GSS}	--	--	±100	nA
Zero Gate Voltage Drain Current	V _{DS} = -40V, V _{GS} =0V	I _{DSS}	--	-0.1	-1	μA
	V _{DS} = -40V, T _J =55°C		--	-1	-5	μA
Drain-Source On-State Resistance (Note 1)	V _{GS} = -10V, I _D = -12A	R _{DS(on)}	--	15	22	mΩ
	V _{GS} = -4.5V, I _D = -8A		--	27	33	
Forward Transconductance (Note 2)	V _{DS} = -5V, I _D = -12A	g _{fs}	--	35	--	S
Dynamic (Note 2)						
Total Gate Charge (Note 3)	V _{DS} = -20V, I _D = -12A, V _{GS} = -10V	Q _g	--	31.4	--	nC
Gate-Source Charge (Note 3)		Q _{gs}	--	7.6	--	
Gate-Drain Charge (Note 3)		Q _{gd}	--	6.2	--	
Input Capacitance	V _{DS} = -20V, V _{GS} = 0V, F= 1.0MHz	C _{iss}	--	1870	--	pF
Output Capacitance		C _{oss}	--	185	--	
Reverse Transfer Capacitance		C _{rss}	--	155	--	
Switching						
Turn-On Delay Time (Note 3)	V _{DS} = -20V, R _L = 1.6Ω, V _{GS} = -10V, R _{GEN} = 3Ω	t _{d(on)}	--	10	--	nS
Rise Time (Note 3)		t _r	--	18	--	
Turn-Off Delay Time (Note 3)		t _{d(off)}	--	38	--	
Fall Time (Note 3)		t _f	--	24	--	
Source-Drain Diode Ratings and Characteristics (Note 2)						
Forward Voltage	V _{GS} = 0V, I _{SD} = -12A	V _{SD}	--	-0.95	-1.5	V
Continuous Source Current	Integral reverse diode in the MOSFET	I _S	--	--	-28	A
Pulsed Current (Note 1)		I _{SM}	--	--	-50	A

Notes:

1. Pulse test; pulse width ≤ 300 μS, duty cycle ≤ 2%.
2. Guaranteed by design, not subject to production testing.
3. Independent of operating temperature

TYPICAL CHARACTERISTICS (25 °C, unless otherwise noted)

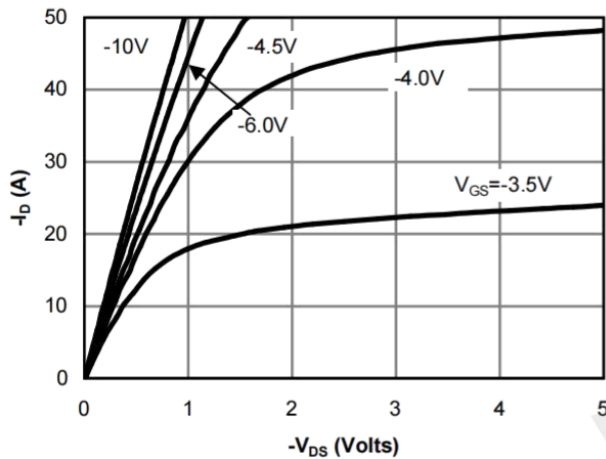


Figure 1: On-Region Characteristics

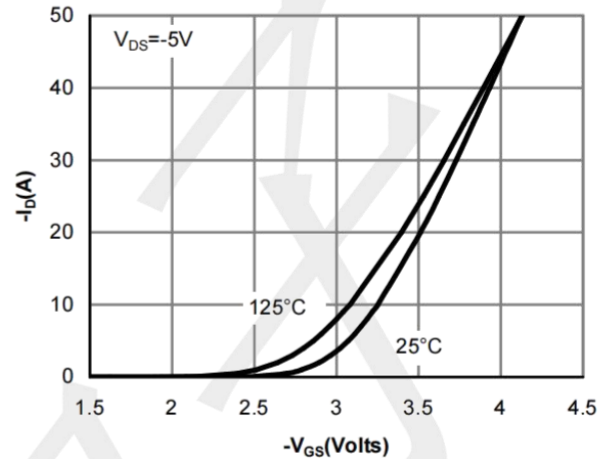


Figure 2: Transfer Characteristics

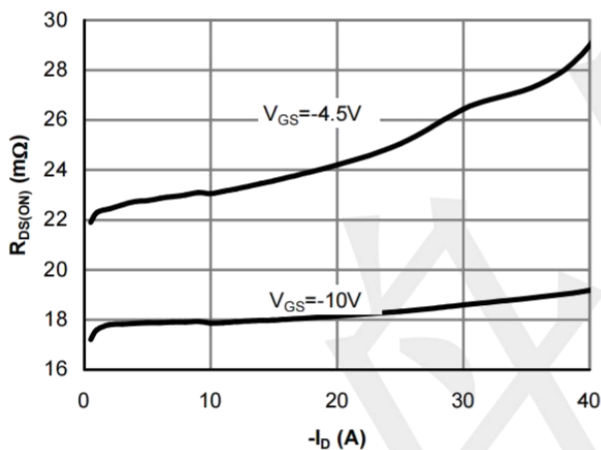


Figure 3: On-Resistance vs. Drain Current and Gate Voltage

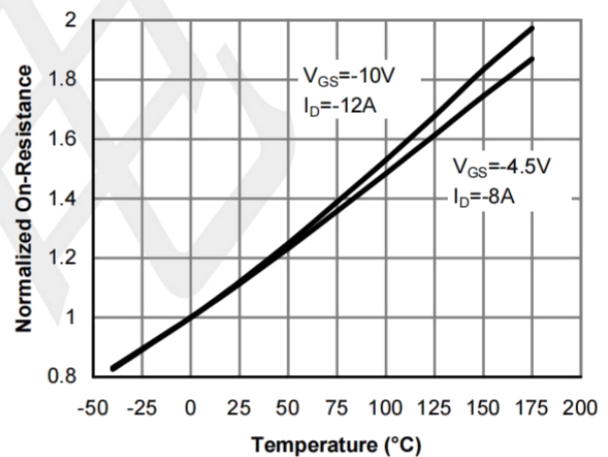


Figure 4: On-Resistance vs. Junction Temperature

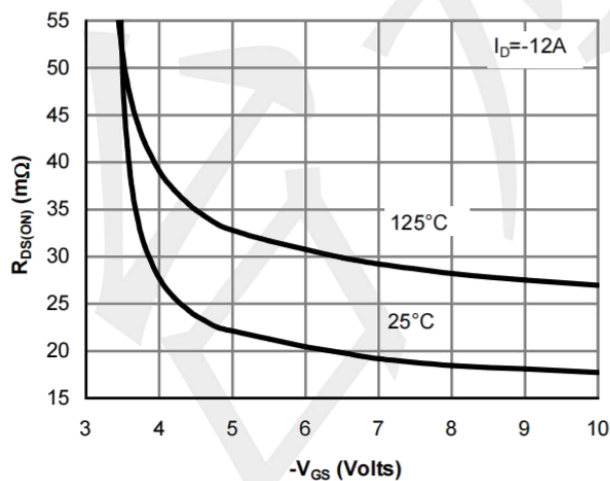


Figure 5: On-Resistance vs. Gate-Source Voltage

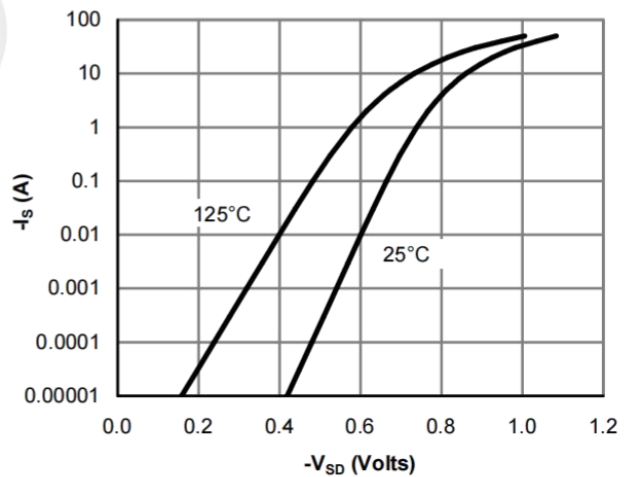
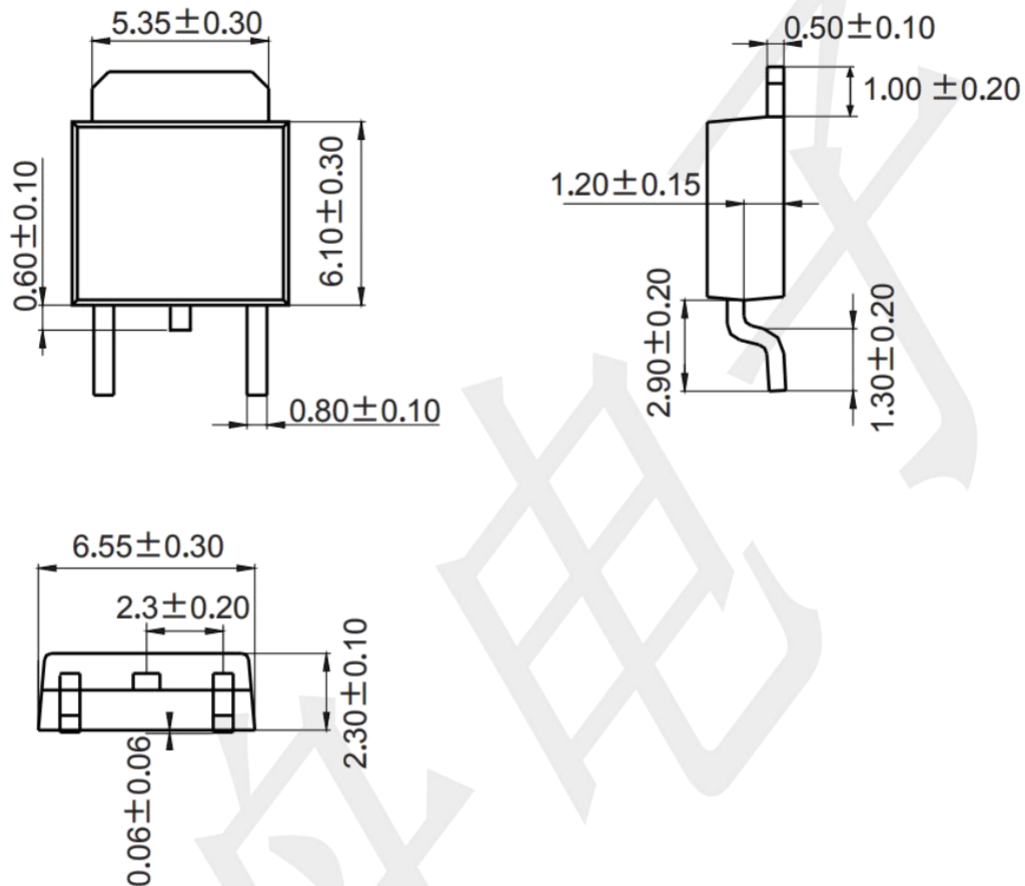


Figure 6: Body-Diode Characteristics

Package Outline Dimensions (unit: mm)

TO-252



Mounting Pad Layout (unit: mm)

