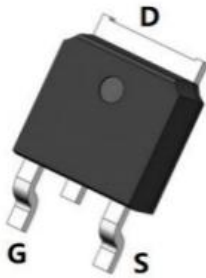


Product Summary

- V_{DS} 100 V
- I_{DS} 50A
- $R_{DS(ON)}$ (at $V_{GS}=10V$) <18m Ω
- Advanced Trench Technology

Package and Pin Configuration



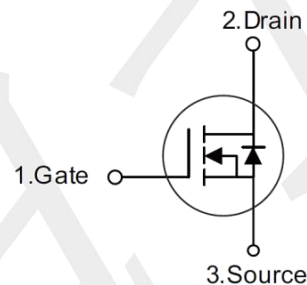
TO-252

Marking: 50N10

Application

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

Circuit diagram



Absolute Maximum Ratings (T_A=25°C unless otherwise noted)

PARAMETER	SYMBOL	LIMIT	UNIT
Drain-Source Voltage	V_{DS}	100	V
Gate-Source Voltage	V_{GS}	±20	V
Continuous Drain Current	I_D	$T_C=25^\circ C$	50
		$T_C=100^\circ C$	30
Pulsed Drain Current	I_{DM}	200	A
Total Power Dissipation	$P_{D(TOT)}$	100	W
Operating Junction Temperature Range	T_J	-55 to +175	°C
Storage Temperature Range	T_{stg}	-55 to +175	°C

Thermal Characteristic

PARAMETER	Symbol	Value	Unit
Thermal Resistance, Junction to Case PCB Mount (Note)	$R_{\theta JC}$	2	°C/W

Note : 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}	100	--	--	V
Gate-Source Threshold Voltage	V _{DS} =V _{GS} , I _D =250μA	V _{GS(th)}	--	1.5	--	V
Gate-Source Leakage	V _{DS} =0V, V _{GS} = ±20V	I _{GSS}	--	--	±100	nA
Zero Gate Voltage Drain Current	V _{DS} = 80V, V _{GS} =0V	I _{DSS}	--	--	1	μA
	V _{DS} = 80V, T _J =125°C		--	--	50	μA
Drain-Source On-State Resistance (Note 1)	V _{GS} = 10V, I _D = 20A	R _{DS(on)}	--	18	--	mΩ
	V _{GS} = 4.5V, I _D = 20A		--	22	--	
Dynamic (Note 2)						
Total Gate Charge (Note 3)	V _{DS} = 50V, I _D = 10A, V _{GS} = 10V	Q _g	--	33.3	--	nC
Gate-Source Charge (Note 3)		Q _{gs}	--	6.9	--	
Gate-Drain Charge (Note 3)		Q _{gd}	--	5.1	--	
Input Capacitance	V _{DS} = 50V, V _{GS} = 0V, F = 1.0MHz	C _{iss}	--	1870	--	pF
Output Capacitance		C _{oss}	--	260	--	
Reverse Transfer Capacitance		C _{rss}	--	6.9	--	
Switching						
Turn-On Delay Time (Note 3)	V _{DD} = 50V, I _D = 10A, V _{GS} = 10V, R _{GEN} = 6Ω	t _{d(on)}	--	6.5	--	nS
Rise Time (Note 3)		t _r	--	7	--	
Turn-Off Delay Time (Note 3)		t _{d(off)}	--	19.6	--	
Fall Time (Note 3)		t _f	--	8	--	
Source-Drain Diode Ratings and Characteristics (Note 2)						
Forward Voltage	V _{GS} = 0V, I _S = 20A	V _{SD}	--	0.8	1.3	V
Continuous Source Current	Integral reverse diode in the MOSFET	I _S	--	--	50	A
Pulsed Current (Note 1)		I _{SM}	--	--	200	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

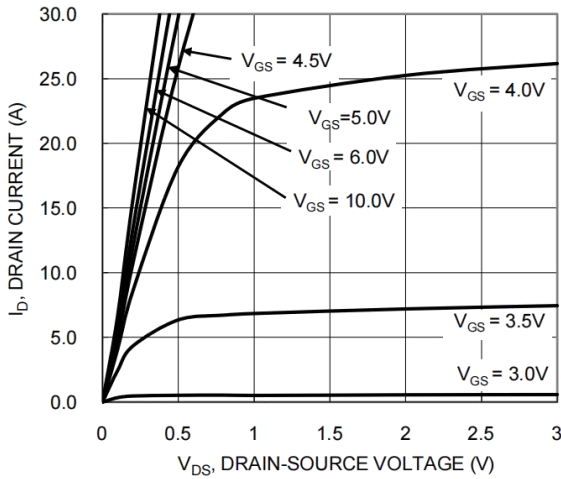


Figure 1. Typical Output Characteristic

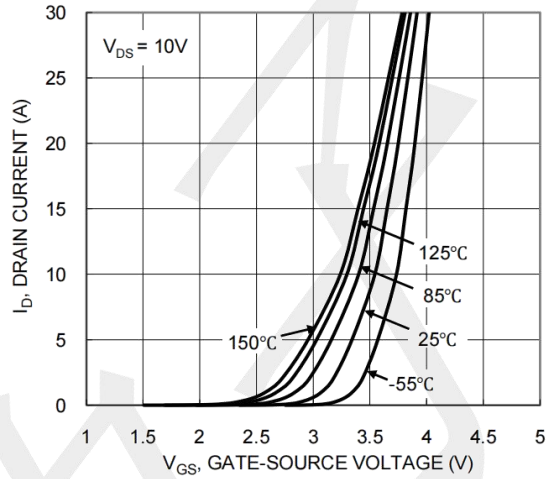


Figure 2. Typical Transfer Characteristic

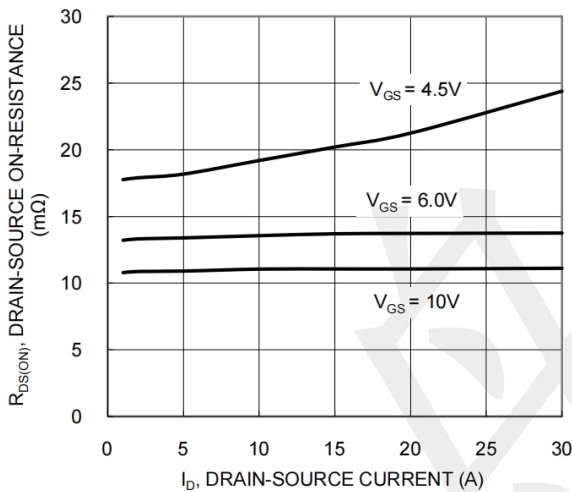


Figure 3. Typical On-Resistance vs. Drain Current and Gate Voltage

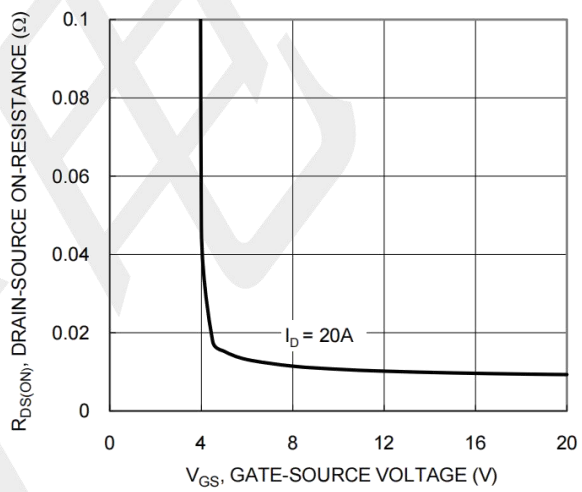


Figure 4. Typical Transfer Characteristic

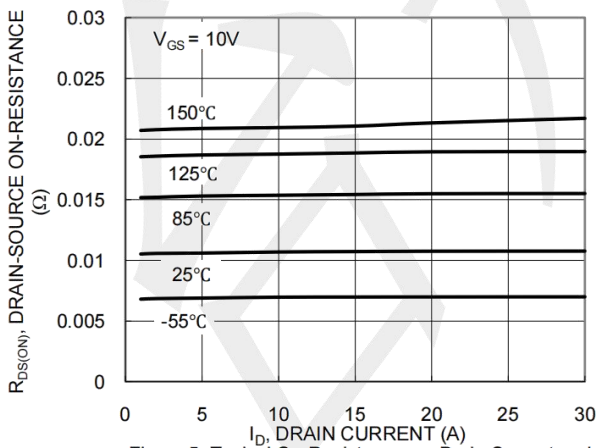


Figure 5. Typical On-Resistance vs. Drain Current and Junction Temperature

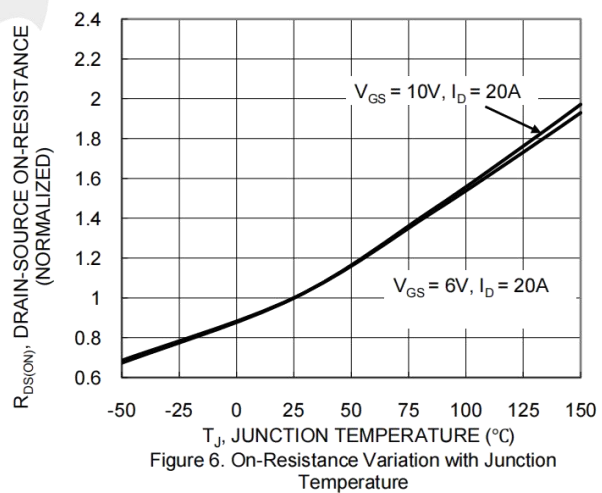


Figure 6. On-Resistance Variation with Junction Temperature

TYPICAL CHARACTERISTICS

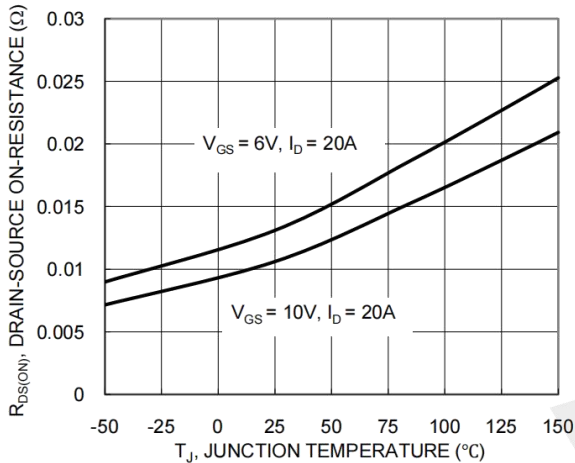


Figure 7. On-Resistance Variation with Junction Temperature

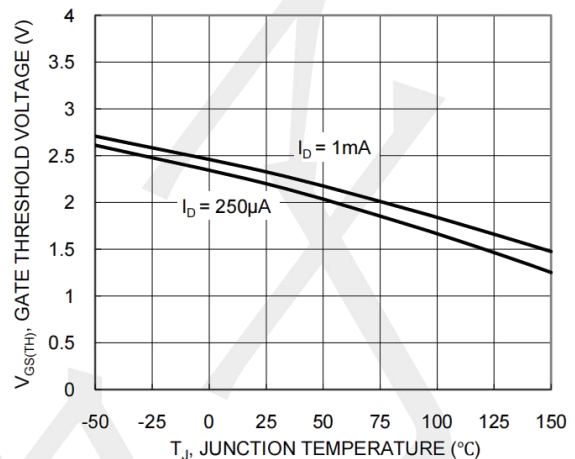


Figure 8. Gate Threshold Variation vs. Junction Temperature

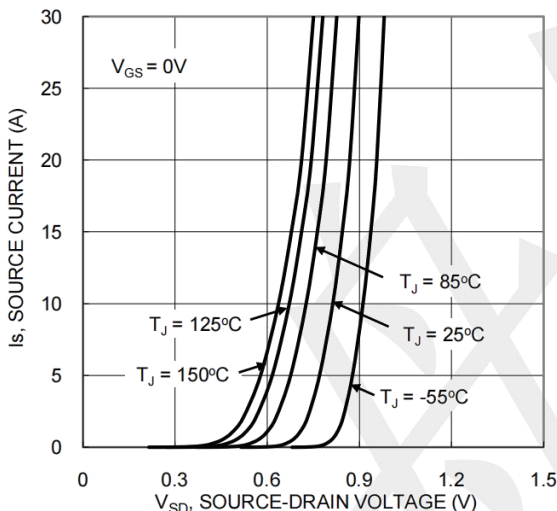


Figure 9. Diode Forward Voltage vs. Current

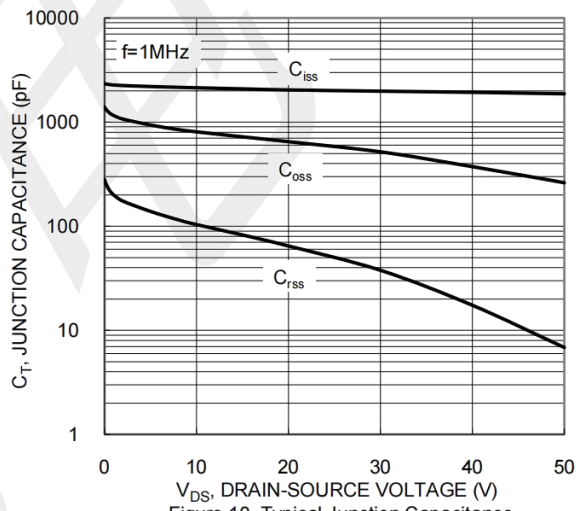


Figure 10. Typical Junction Capacitance

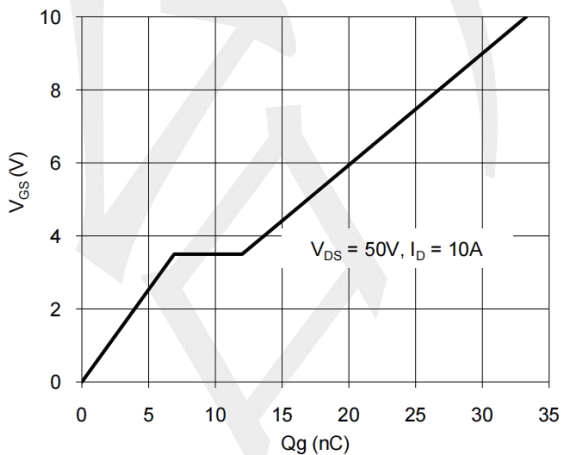


Figure 11. Gate Charge

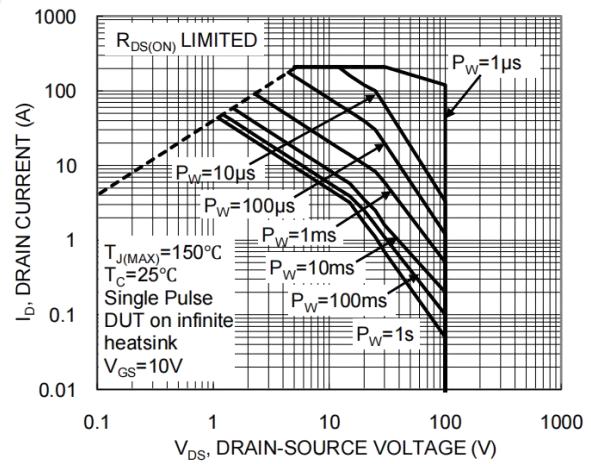
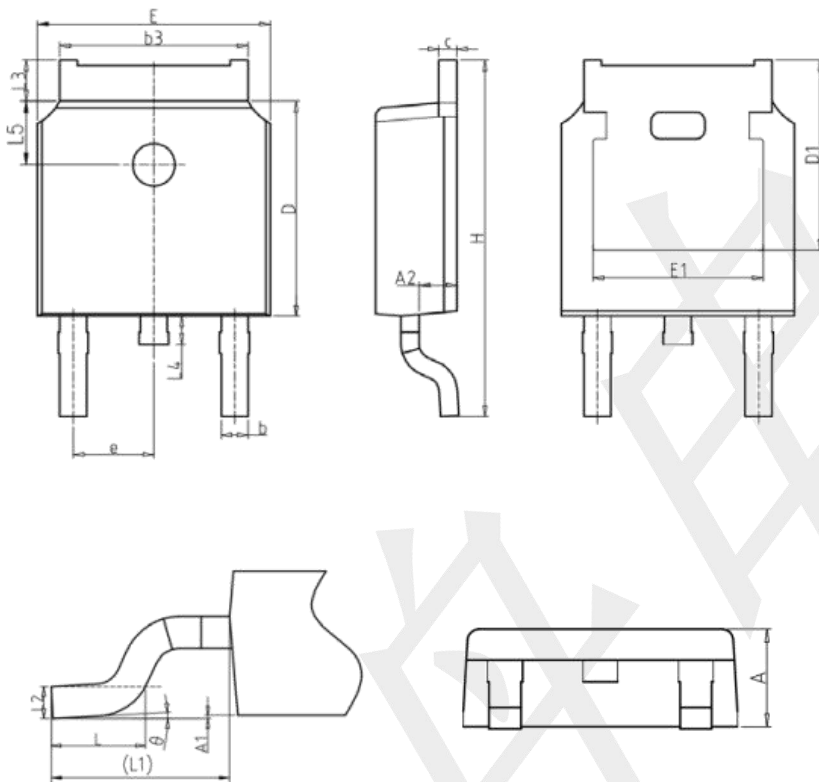


Figure 12. SOA, Safe Operation Area

Outline Drawing - TO-252



COMMON DIMENSIONS

SYMBOL	mm		
	MIN	NOM	MAX
A	2.20	2.30	2.40
A1	0.00	-	0.20
A2	0.97	1.07	1.17
b	0.68	0.78	0.90
b3	5.20	5.33	5.50
c	0.43	0.53	0.63
D	5.98	6.10	6.22
D1	5.30REF		
E	6.40	6.60	6.80
E1	4.63	-	-
e	2.286BSC		
H	9.40	10.10	10.50
L	1.38	1.50	1.75
L1	2.90REF		
L2	0.51BSC		
L3	0.88	-	1.28
L4	-	-	1.00
L5	1.65	1.80	1.95
θ	0°	-	8°

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