

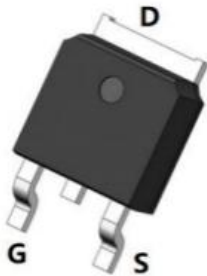
Product Summary

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

Application

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

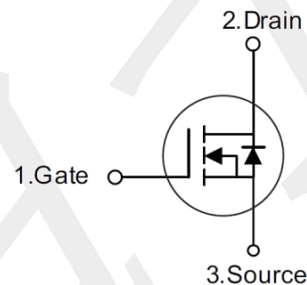
Package and Pin Configuration



TO-252

Marking: 50N10

Circuit diagram



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

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

Thermal Characteristic

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

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

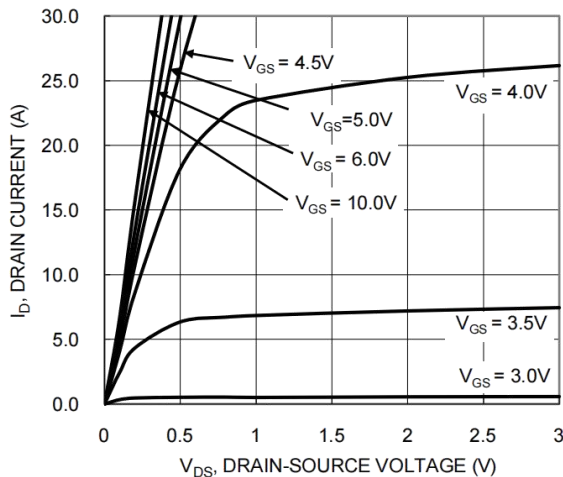


Figure 1. Typical Output Characteristic

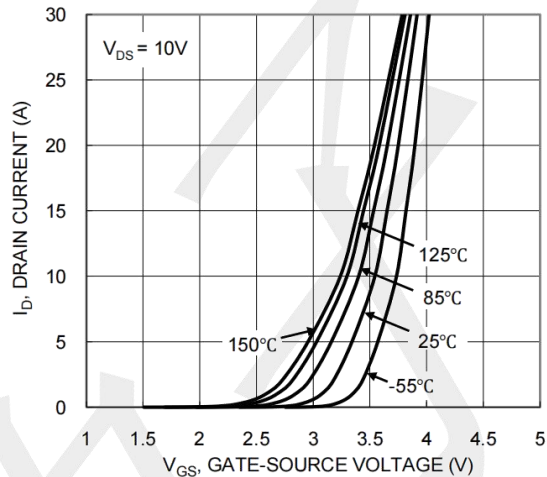


Figure 2. Typical Transfer Characteristic

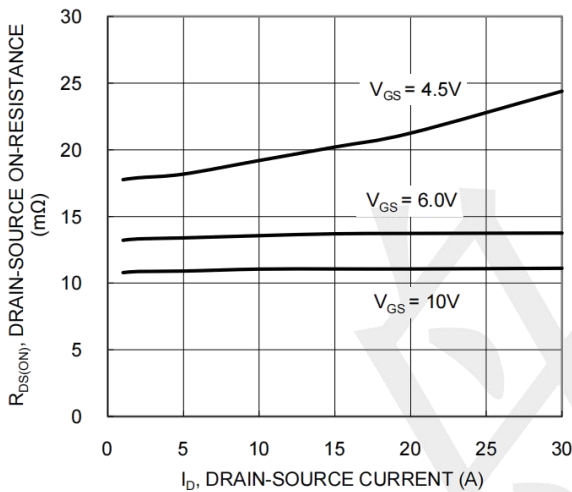


Figure 3. Typical On-Resistance vs. Drain Current and Gate Voltage

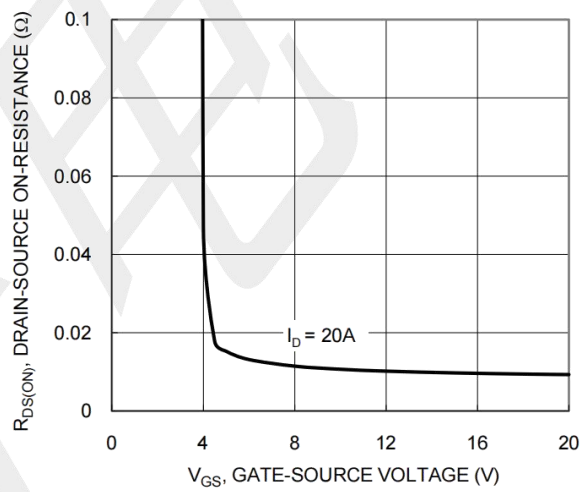


Figure 4. Typical Transfer Characteristic

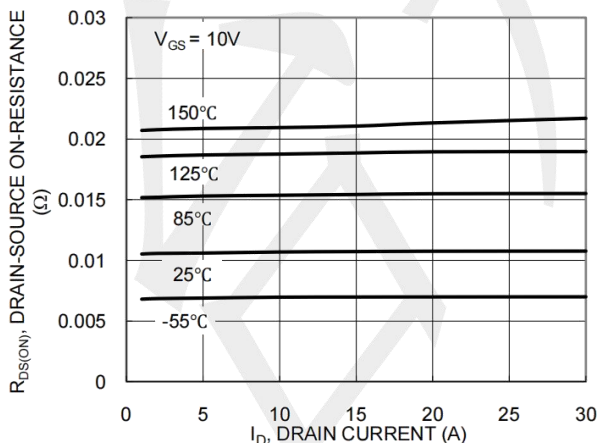


Figure 5. Typical On-Resistance vs. Drain Current and Junction Temperature

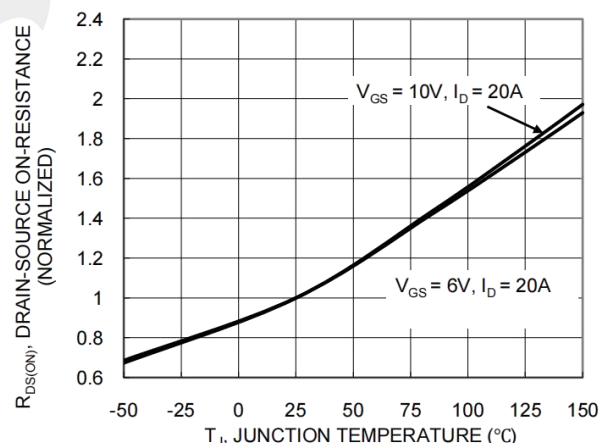
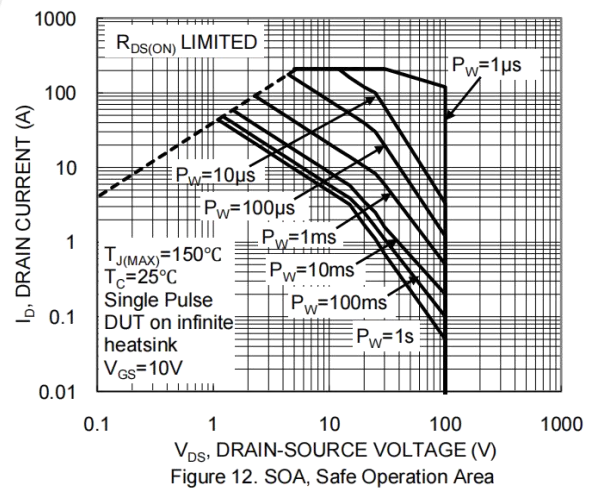
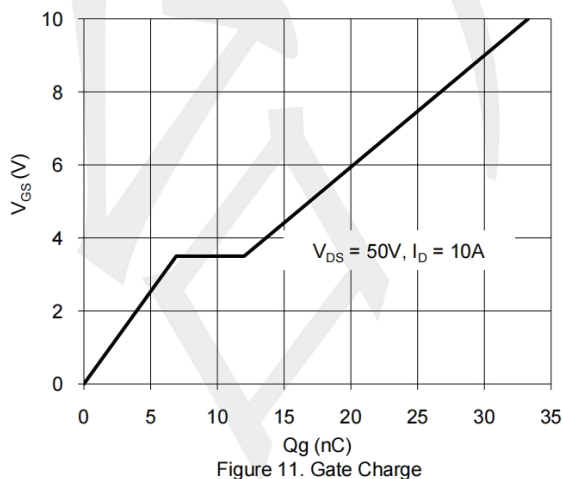
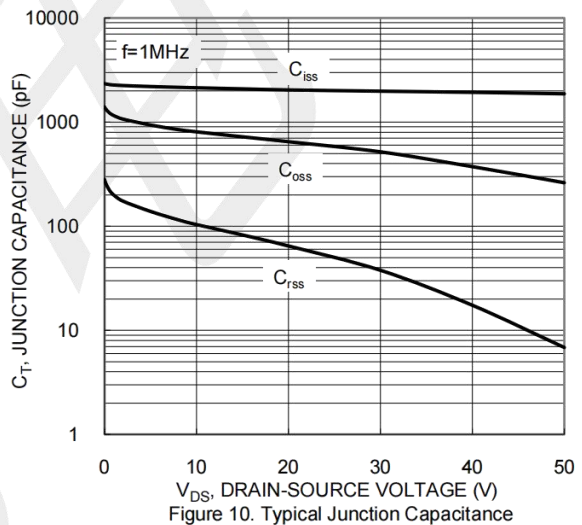
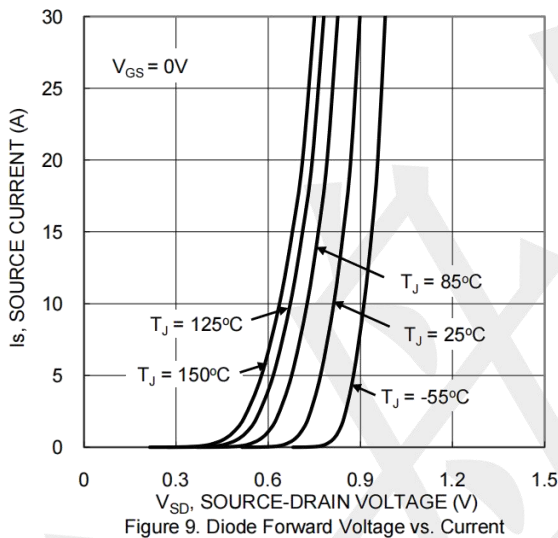
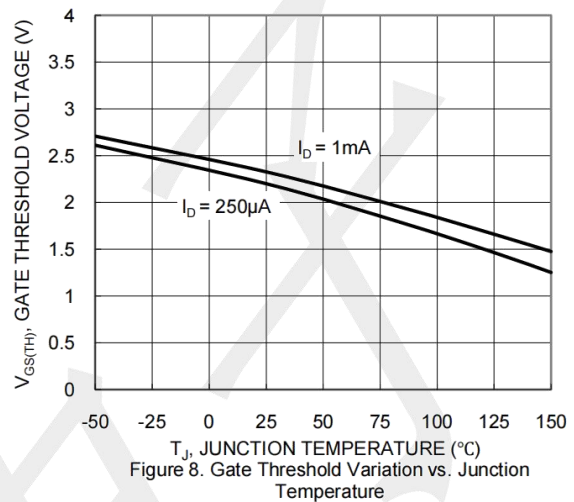
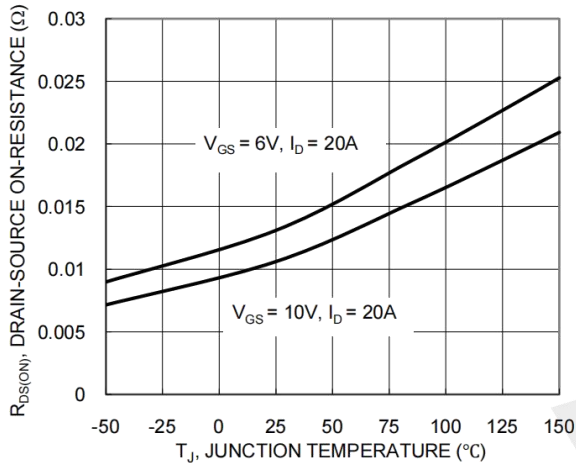
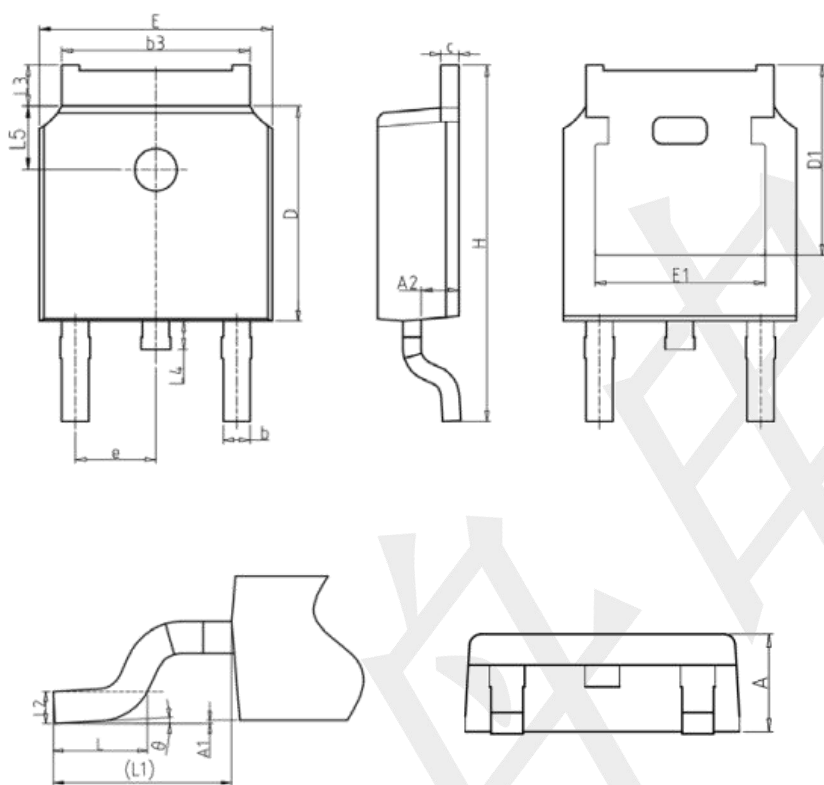


Figure 6. On-Resistance Variation with Junction Temperature

TYPICAL CHARACTERISTICS



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°