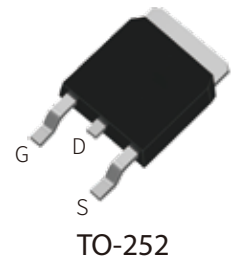


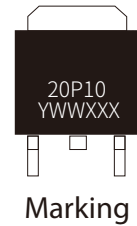
## FEATURES

- | Surface-mounted package
- | Low gate charge



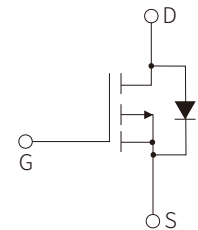
## APPLICATION

- | Motor driver appliances
- | High power inverter system
- | Adapter appliances



## APPROVALS

<b>RoHS</b>	Compliance with 2011/65/EU
<b>HF</b>	Compliance with IEC61249-2-21:2003



Schematic Symbol

## ABSOLUTE MAXIMUM RATINGS

Parameter	Symbol	Value	Unit
Drain-Source Voltage $T_c=25^\circ\text{C}$	$V_{DS}$	-100	V
Gate-Source Voltage $T_c=25^\circ\text{C}$	$V_{GS}$	$\pm 20$	V
Drain Current (DC) $T_c=25^\circ\text{C}$ , $V_{GS}=-10\text{V}$	$I_D$	-20	A
Drain Current (Pulsed) * $T_c=25^\circ\text{C}$ , $V_{GS}=-10\text{V}$	$I_{DM}^*$	-44	A
Diode Forward Current $T_c=25^\circ\text{C}$	$I_S$	-20	A
Drain power dissipation $T_c=25^\circ\text{C}$	$P_{tot}$	35	W
Thermal Resistance- Junction to Ambient	$R_{\theta JA}^{**}$	37	$^\circ\text{C/W}$
Thermal Resistance- Junction to Case	$R_{\theta JC}^{***}$	1.2	$^\circ\text{C/W}$
Junction Temperature	$T_J$	150	$^\circ\text{C}$
Storage Temperature	$T_{STG}$	-55 to 150	$^\circ\text{C}$

Notes:

- \* Pulse width  $\leq 300\mu\text{s}$ , duty cycle  $\leq 2\%$
- \*\* Mounted on PCB of 1 in<sup>2</sup> pad area
- \*\*\* Mounted on Large Heat Sink

## ELECTRICAL CHARACTERISTICS (T<sub>A</sub>=25°C)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
<b>Static Characteristics</b>						
Drain-Source Breakdown Voltage	BV <sub>DSS</sub>	V <sub>GS</sub> =0V, I <sub>D</sub> =-250μA	-100			V
Drain Leakage Current	I <sub>DSS</sub>	V <sub>DS</sub> =-80V, V <sub>GS</sub> =0V			-1.0	μA
Gate Leakage Current	I <sub>GSS</sub>	V <sub>GS</sub> =±20V, V <sub>DS</sub> =0V			±100	nA
Gate Threshold Voltage	V <sub>GS(th)</sub>	V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> =-250μA	-1.0		-2.5	V
On-State Resistance	R <sub>DS(on)</sub> <sup>a</sup>	V <sub>GS</sub> =-10V, I <sub>D</sub> =-2A		165	180	mΩ
		V <sub>GS</sub> =-4.5V, I <sub>D</sub> =-1A		175	190	mΩ
<b>Gate Charge Characteristics<sup>b</sup></b>						
Total Gate Charge	Q <sub>g</sub>	V <sub>DS</sub> =-50V, V <sub>GS</sub> =-10V, I <sub>DS</sub> =-2A		27		nC
Gate- Source Charge	Q <sub>gs</sub>			5.3		nC
Gate- Drain Charge	Q <sub>gd</sub>			3.2		nC
<b>Switching Characteristics</b>						
Turn-On Delay Time	t <sub>d(on)</sub>	V <sub>DS</sub> = - 50 V, V <sub>GEN</sub> = - 10 V, R <sub>G</sub> = 4.5 Ω, R <sub>L</sub> = 25 Ω, I <sub>DS</sub> = - 2 A		10		nS
Turn-On Rise Time	t <sub>r</sub>			27		nS
Turn-Off Delay Time	t <sub>d(off)</sub>			288		nS
Turn-Off Fall Time	t <sub>f</sub>			88		nS
Input Capacitance	C <sub>iss</sub>	V <sub>DS</sub> =-50V, V <sub>GS</sub> =0V Frequency = 1 MHz		1545		pF
Output Capacitance	C <sub>oss</sub>			37		pF
Reverse Transfer Capacitance	C <sub>rss</sub>			25		pF
<b>Diode Characteristics</b>						
Diode Forward Voltage	V <sub>SD</sub> <sup>a</sup>	I <sub>SD</sub> = -2A, V <sub>GS</sub> = 0V			-1.3	V
Reverse Recovery Time	t <sub>rr</sub>	I <sub>SD</sub> = -6 A, dI <sub>SD</sub> / dt=100A/μs		40		nS
Reverse Recovery Charge	Q <sub>rr</sub>			28		nC

**Notes:**

a: Pulse test; pulse width ≤ 300 μs, duty cycle ≤ 2%

b: Guaranteed by design, not subject to production testing

# PARAMETER CHARACTERISTIC CURVE

Figure1: Power Capability

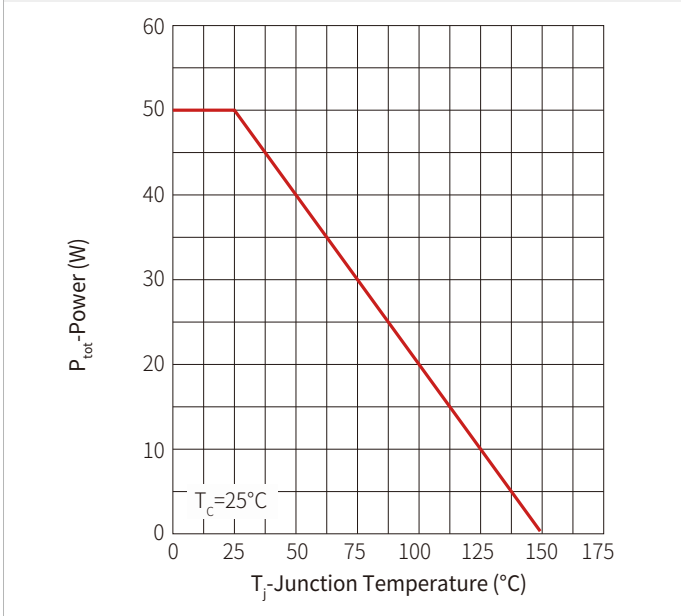


Figure2: Current Capability

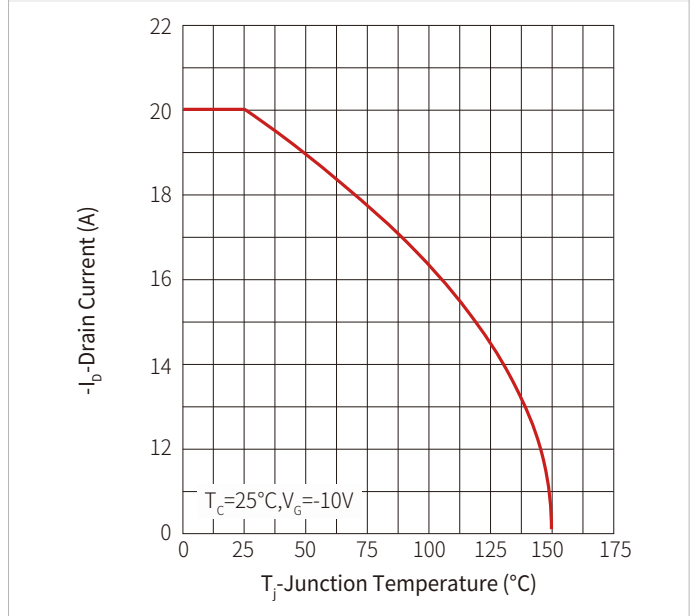


Figure3: Safe Operation Area

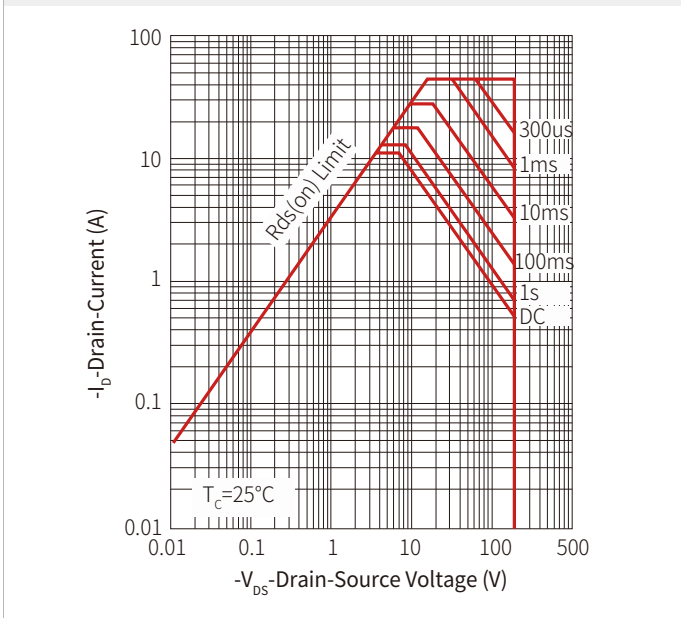
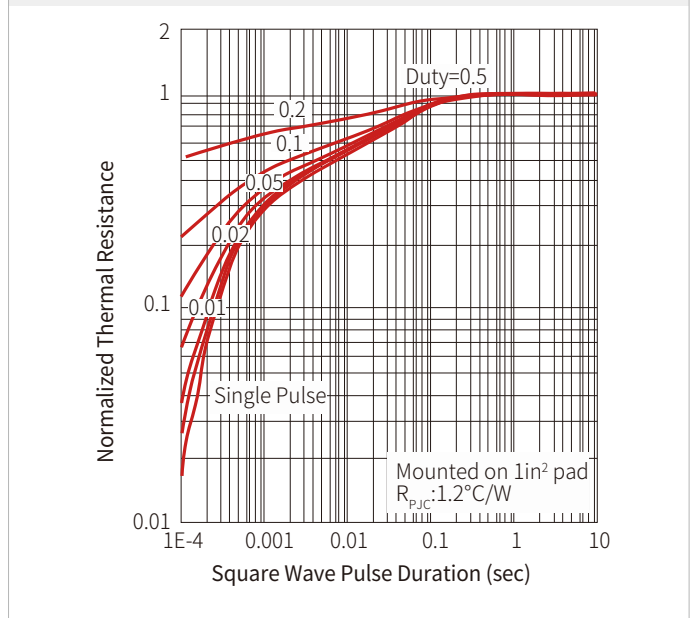
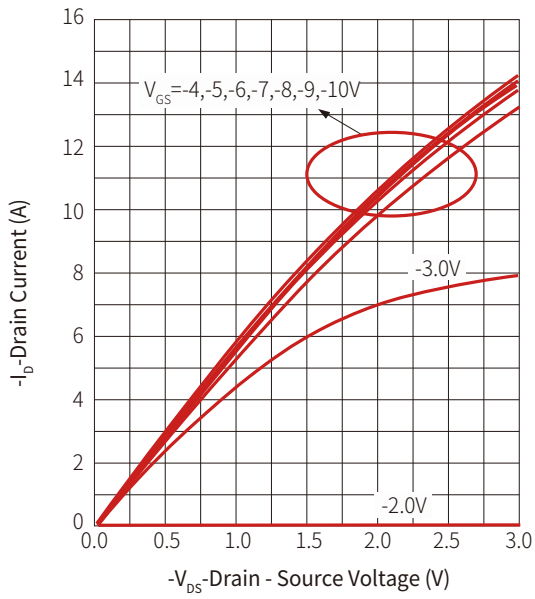


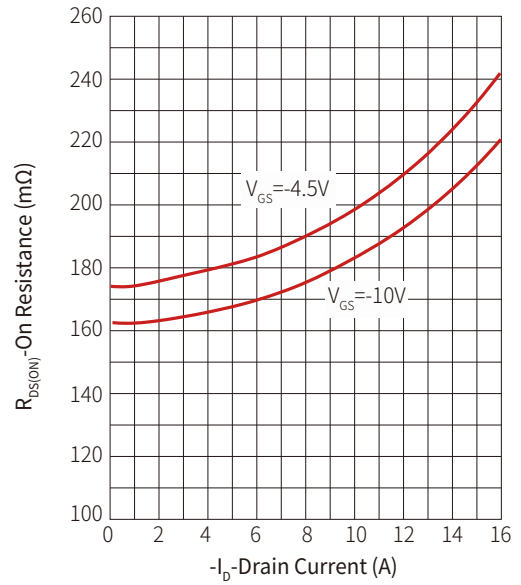
Figure 4: Transient Thermal Impedance



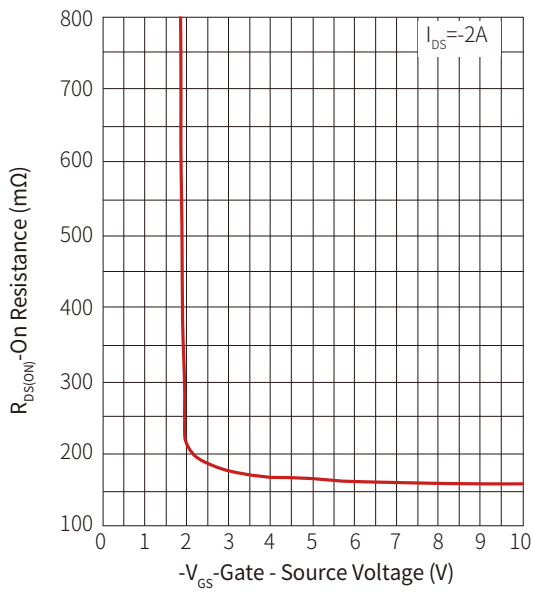
**Figure 5: Output Characteristics**



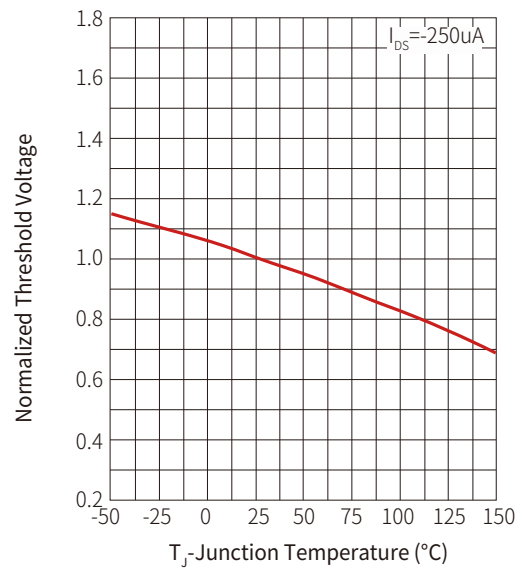
**Figure 6: Drain-Source On Resistance**



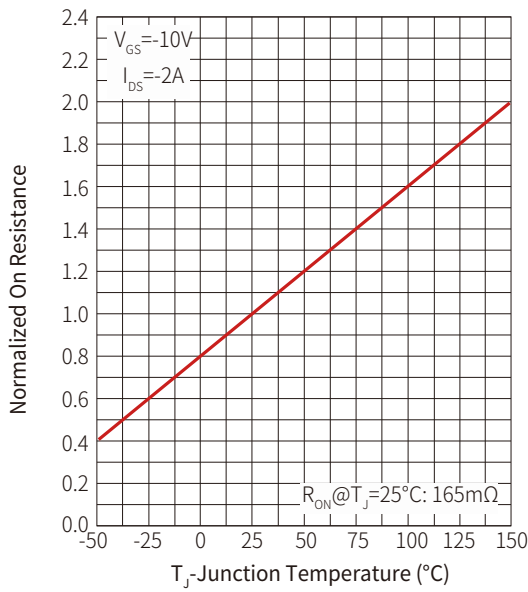
**Figure 7: Transfer Characteristics**



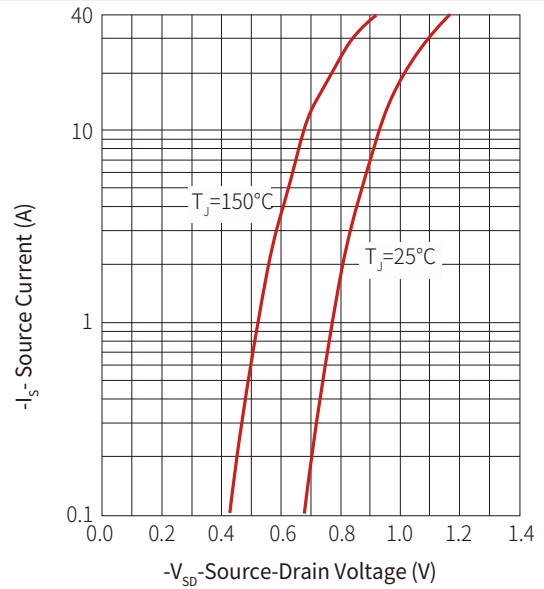
**Figure 8: Normalized Threshold Voltage**



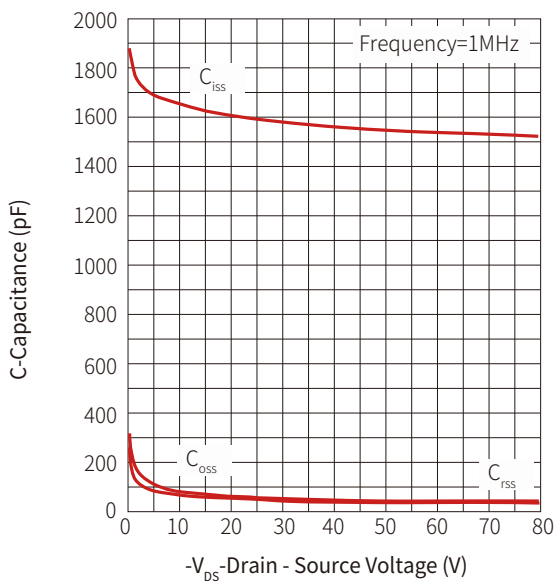
**Figure 9: Normalized On Resistance**



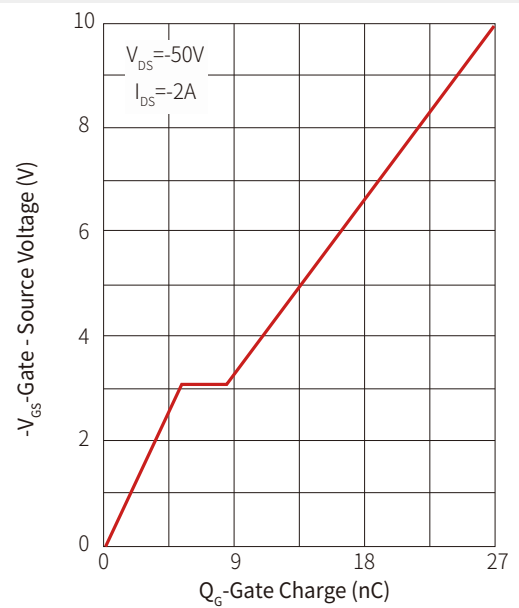
**Figure 10: Diode Forward Current**



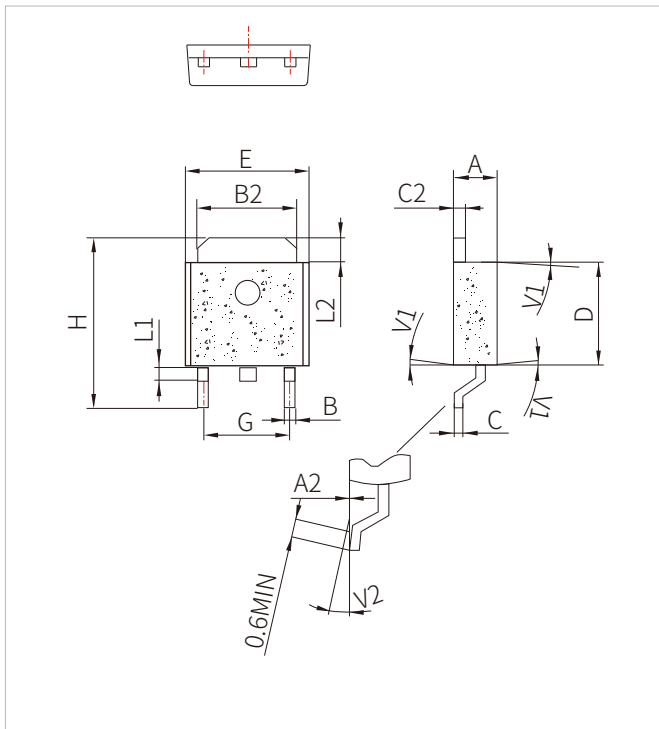
**Figure 11: Capacitance**



**Figure 12: Gate Charge**



## TO-252 PACKAGE MECHANICAL DATA



Ref.	Dimensions					
	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A	2.10		2.50	0.083		0.098
A2	0.03		0.23	0.001		0.009
B	0.55		0.65	0.022		0.026
B2	5.10		5.40	0.200		0.213
C	0.45		0.62	0.018		0.024
C2	0.48		0.62	0.019		0.024
D	6.00		6.20	0.236		0.244
E	6.40		6.80	0.252		0.268
G	4.40		4.70	0.173	0.1	0.185
H	9.35		10.7	0.368		0.421
L1	1.30		1.70	0.051	0.143	0.067
L2	1.37		1.50	0.054		0.059
V1		4°			0.130	
V2	0°		8°	0°		8°

## ORDERING INFORMATION

Part Number	Component Package	QTY/Reel	Reel Size
SPMN20P10K	TO-252	2500PCS	13"

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