

FEATURES

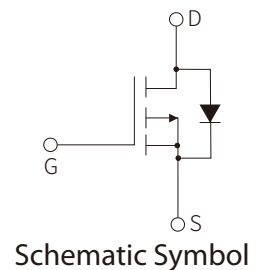
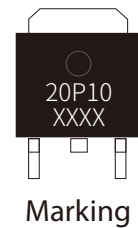
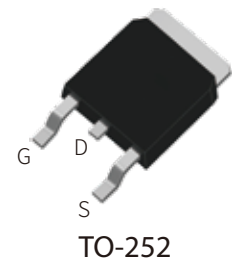
- | Surface-mounted package
- | Low gate charge

APPLICATION

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

APPROVALS

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



ABSOLUTE MAXIMUM RATINGS

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

Notes:

* Pulse width $\leq 300\mu\text{s}$, duty cycle $\leq 2\%$

** Mounted on PCB of 1 in² pad area

*** Mounted on Large Heat Sink

ELECTRICAL CHARACTERISTICS ($T_A=25^{\circ}\text{C}$)

Parameter	Symbol	Test Conditions	Min.	Typ.	Max.	Unit
Static Characteristics						
Drain-Source Breakdown Voltage	BV_{DSS}	$V_{GS}=0V, I_D=-250\mu A$	-100			V
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_{DS}=-250\mu A$	-1.0		-2.5	V
Drain Leakage Current	I_{DSS}	$V_{DS}=-80V, V_{GS}=0V$			-1.0	μA
Gate Leakage Current	I_{GSS}	$V_{GS}=\pm 20V, V_{DS}=0V$			± 100	nA
On-State Resistance	$R_{DS(on)}^a$	$V_{GS}=-10V, I_{DS}=-2A$		165	180	m Ω
		$V_{GS}=-4.5V, I_{DS}=-1A$		175	190	m Ω
Diode Characteristics						
Diode Forward Voltage	V_{SD}^a	$I_{SD}=-2A, V_{GS}=0V$			-1.3	V
Reverse Recovery Time	t_{rr}	$I_{SD}=-6A,$ $dI_{SD}/dt=100A/\mu s$		40		nS
Reverse Recovery Charge	Q_{rr}			28		nC
Dynamic Characteristics ^b						
Input capacitance	C_{iss}	$V_{GS}=0V, V_{DS}=-50V,$ Frequency = 1 MHz		1545		pF
Output capacitance	C_{oss}			37		pF
Reverse transfer capacitance	C_{rss}			25		pF
Turn-on Delay Time	$t_{d(on)}$	$V_{DS}=-50V, V_{GEN}=-10V$ $R_G=4.5\Omega, R_L=25\Omega,$ $I_D=-2A$		10		nS
Turn-on Rise Time	t_r			27		nS
Turn-Off Delay Time	$t_{d(off)}$			288		nS
Turn-Off Fall Time	t_f			88		nS
Gate Charge Characteristics ^b						
Total Gate Charge	Q_g	$V_{DS}=-50V, V_{GS}=-10V, I_{DS}=-2A$		27		nC
Gate-Source Charge	Q_{gs}			5.3		nC
Gate-Drain Charge	Q_{gd}			3.2		nC

Notes:

a : Pulse test ; pulse width $\leq 300\mu s$, duty cycle $\leq 2\%$

b : Guaranteed by design, not subject to production testing

PARAMETER CHARACTERISTIC CURVE

Figure1: Power Capability

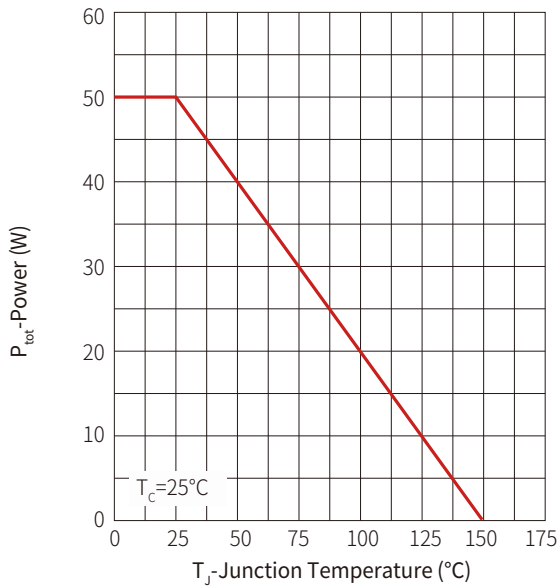


Figure2: Current Capability

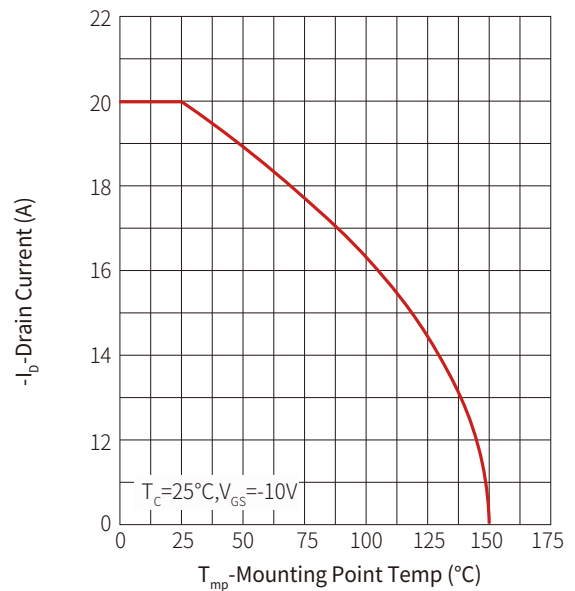


Figure3: Safe operating Area

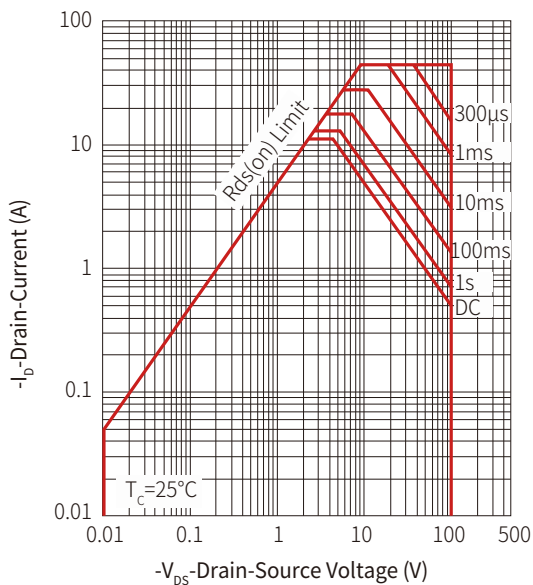


Figure 4: Transient Thermal Impedance

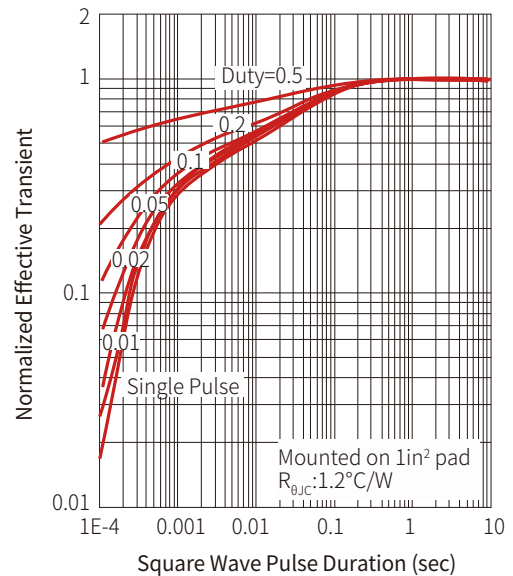


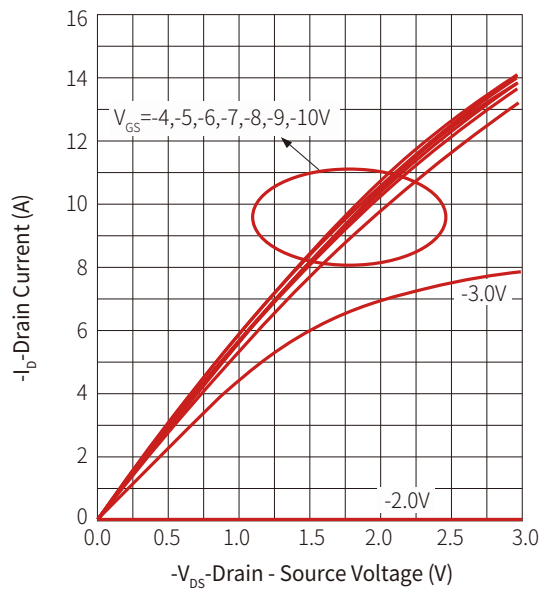
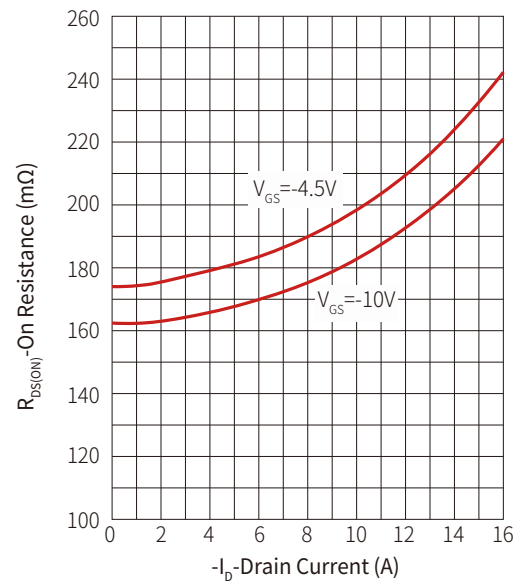
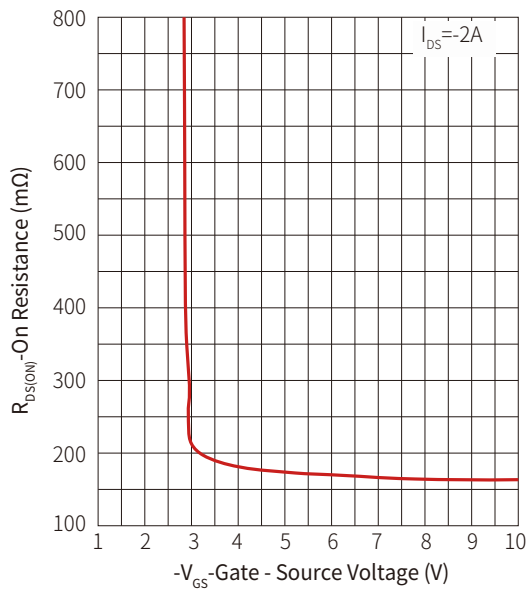
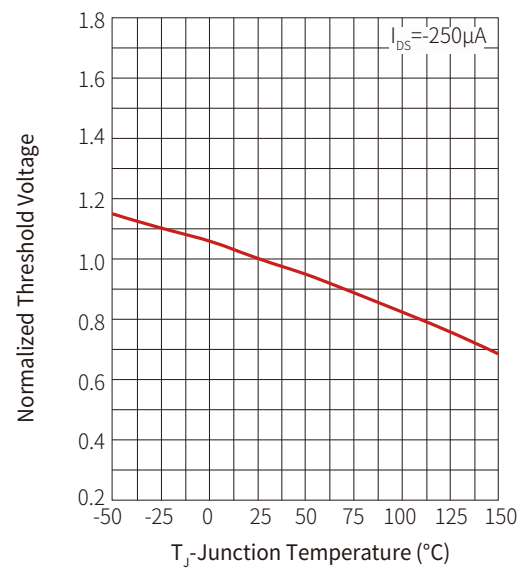
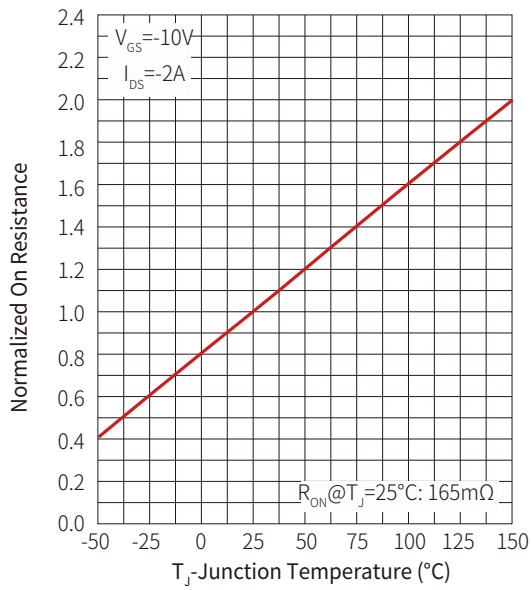
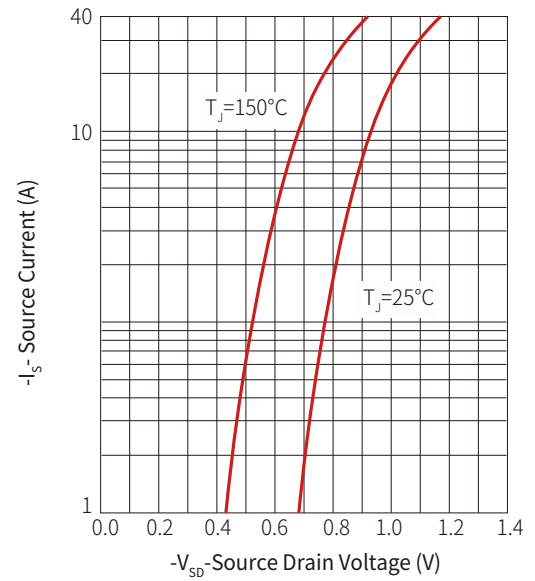
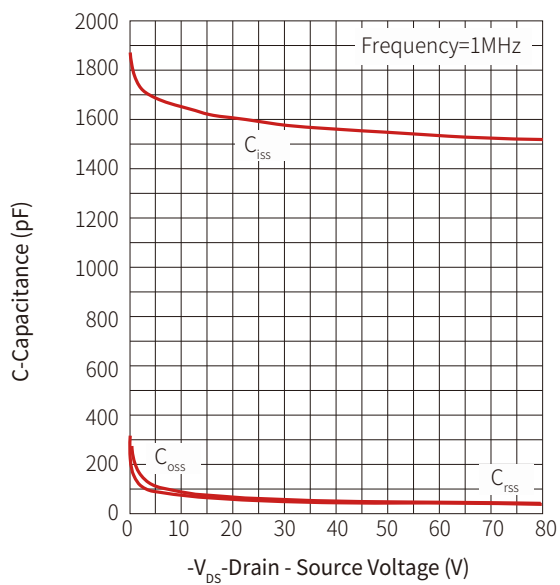
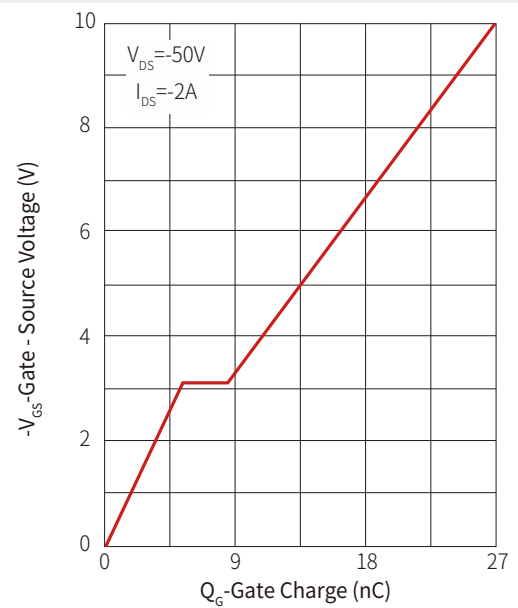
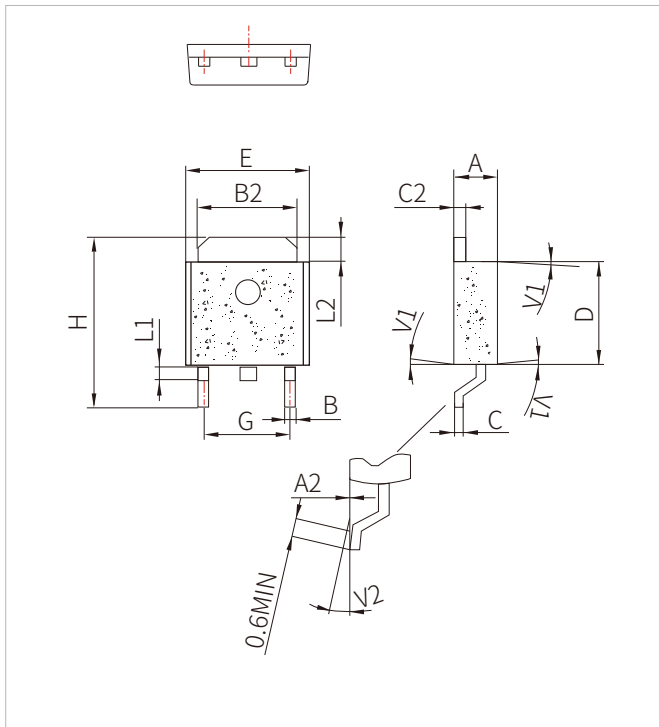
Figure 5: Output Characteristics

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
SPM20P10K	TO-252	2500PCS	13"

Headquarters

No.3387 Shendu Road
Pujiang I&E Park
Minhang Shanghai China
201000

Hotline

400-021-5756

Web

<https://www.semiware.com>

Sales Center

Tel: 86-21-3463-7458
Email: sales18@semiware.com

Customer Service

Tel: 86-21-5484-1001
Email: sales17@semiware.com

Technical Support

Tel: 86-21-3463-7654
Email: fae01@semiware.com

Complaint & Suggestions

Tel: 86-21-3463-7172
Ext: 8868
Email: cs03@semiware.com

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