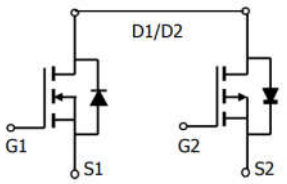
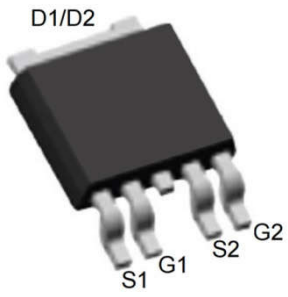
40V N+P-CHANNEL ENHANCEMENT MODE MOSFET

MAIN CHARACTERISTICS

I_D	20A
V_{DSS}	40V
R_{DSON}-typ(@V_{GS}=10V)	< 32mΩ(Type:24 mΩ)
I_D	-18A
V_{DSS}	-40V
R_{DSON}-typ(@V_{GS}=-10V)	< 48mΩ(Type:42 mΩ)





TO-252-4L

lead-free ROHS

Application

- Boost driver
- Brushless motor

Product Specification Classification

Part Number	Package	Marking	Pack
YFW20G04GD	TO-252-4L	YFW20G04GD XXXX	2500PCS/Tape

Maximum Ratings at Tc=25°C unless otherwise specified

Characteristics	Symbols	Value		Units
		N-Ch	P-Ch	
Drain-Source Voltage	V_{DS}	40	-40	V
Gate - Source Voltage	V_{GS}	±20	±20	V
Continuous Drain Current, V_{GS} @ 10V[1]@T_C=25℃	I_D	20	-18	A
Continuous Drain Current, V_{GS} @ 10V[1]@T_C=100℃	I_D	15	-16	A
Pulsed Drain Current[2]	I_{DM}	35	-36	A
Single Pulse Avalanche Energy[3]	E_{AS}	15	45	mJ
Avalanche Current	I_{AS}	10	-10	A
Total Power Dissipation[4]@T_C=25℃	P_D	20	25	W
Storage Temperature Range	T_{STG}	-55 to +150		°C
Operating Junction Temperature Range	T_J	-55 to +150		°C
Thermal Resistance Junction-Ambient [1]	$R_{\theta JA}$	62		°C/W
Thermal Resistance Junction-Case[1]	$R_{\theta JC}$	5		°C/W

Download from alldatasheet.com

N-Channel Electrical Characteristics (TJ=25 ℃, unless otherwise noted)

Characteristics	Test Condition	Symbols	Min	Typ	Max	Units
Drain-Source Breakdown Voltage	V_{GS}=0V, I_D=250uA	BV_{DSS}	40	44	-	V
BVDSS Temperature Coefficient	Reference to 25℃ , I_D=1mA	$\Delta BV_{DSS/\Delta TJ}$	-	0.032	-	V/℃
Static Drain-Source On-Resistance[2]	V_{GS}=10V, I_D=4A	$R_{DS(ON)}$	-	24	32	mΩ
	V_{GS}=4.5V, I_D=3A		-	38	48	mΩ
Gate -Threshold Voltage	V_{DS}=V_{GS}, I_D=250uA	$V_{GS(th)}$	1.0	1.5	2.5	V
$V_{GS(th)}$ Temperature Coefficient		$\Delta V_{GS(th)}$	-	-4.5	-	mV/℃
Drain-Source Leakage Current	V_{DS}=32V, V_{GS}=0V T_J=25℃	I_{DSS}	-	-	1	uA
	V_{DS}=32V , V_{GS}=0V , T_J=55℃		-	-	5	
Gate-Source Leakage Current	V_{GS}=±20V, V_{DS}=0V	I_{GSS}	-	-	±100	nA
Forward Transconductance	V_{DS} = 5V, I_D = 4A	g_{fs}	-	8	-	S
Gate Resistance	V_{DS}=0V , V_{GS}=0V , f=1MHz	R_g	-	2.4	4.8	Ω
Total Gate Charge(4.5V)	V_{DS}=15V V_{GS}=4.5V I_D=3A	Q_g	-	5	-	nC
Gate-Source Charge		Q_{gs}	-	1.54	-	
Gate-Drain Charge		Q_{gd}	-	1.84	-	
Turn-on delay time	V_{DD} =15V V_{GS}=10V R_G = 3.3 I_D=1A	$t_{d(on)}$	-	7.8	-	ns
Rise Time		T_r	-	2.1	-	
Turn-Off Delay Time		$t_{d(OFF)}$	-	29	-	
Fall Time		t_f	-	2.1	-	
Input Capacitance	V_{DS}=15V V_{GS}=0V f=1MHz	C_{iss}	-	452	-	pF
Output Capacitance		C_{oss}	-	51	-	
Reverse Transfer Capacitance		C_{rss}	-	38	-	
Continuous Source Current[1,4]	V_G=V_D=0V , Force Current	I_S	-	-	4.5	A
Pulsed Source Current[2,4]		I_{SM}	-	-	14	A
Diode Forward Voltage[2]	V_{GS}=0V , I_S=1A , T_J=25℃	V_{SD}	-	-	1.2	V

Note :
1、The data tested by surface mounted on a 1 inch^2 FR-4 board with 2OZ copper.
2、The data tested by pulsed , pulse width ≦ 300us , duty cycle ≦ 2%
3、The EAS data shows Max. rating . The test condition is V_{DD}=25V,V_{GS}=10V,L=0.1mH,I_{AS}=10A
4、The power dissipation is limited by 150℃ junction temperature
5 、The data is theoretically the same as I_D and I_{DM} , in real applications , should be limited by total power dissipation.

Download from alldatasheet.com

P-Channel Electrical Characteristics (TJ=25 ℃, unless otherwise noted)

Characteristics	Test Condition	Symbols	Min	Typ	Max	Units
Drain-Source Breakdown Voltage	V_{GS}=0V, I_D=-250uA	BV_{DSS}	-40	-	-	V
BVDSS Temperature Coefficient	Reference to 25℃ , I_D=-1mA	$\Delta BV_{DSS/\Delta TJ}$	-	-0.02	-	V/℃
Static Drain-Source On-Resistance[2]	V_{GS}=-10V, I_D=-5A	$R_{DS(ON)}$	-	42	48	mΩ
	V_{GS}=-4.5V, I_D=-3A		-	48	60	
Gate Threshold Voltage	V_{DS}=V_{GS}, I_D=-250uA	$V_{GS(th)}$	-1.0	-1.6	-2.5	V
$V_{GS(th)}$ Temperature Coefficient		$\Delta V_{GS(th)}$	-	3.72	-	mV/℃
Drain-Source Leakage Current	V_{DS}=-32V, V_{GS}=0V T_J=25℃	I_{DSS}	-	-	1	uA
	V_{DS}=-32V , V_{GS}=0V , T_J=55℃		-	-	5	
Gate-Source Leakage Current	V_{GS}=±20V, V_{DS}=0V	I_{GSS}	-	-	±100	nA
Total Gate Charge(-4.5V)	V_{DS}=-20V V_{GS}=-4.5V I_D=-6A	Q_g	-	15.8	-	nC
Gate-Source Charge		Q_{gs}	-	3.5	-	
Gate-Drain Charge		Q_{gd}	-	3.2	-	
Turn-on delay time	V_{DD} =-15V V_{GS}=-10V R_G = 3.3Ω I_D=-1A	$t_{d(on)}$	-	5.2	-	ns
Rise Time		T_r	-	7	-	
Turn-Off Delay Time		$t_{d(OFF)}$	-	23	-	
Fall Time		t_f	-	8	-	
Input Capacitance	V_{DS}=-15V V_{GS}=0V f=1MHz	C_{iss}	-	1000	-	pF
Output Capacitance		C_{oss}	-	160	-	
Reverse Transfer Capacitance		C_{rss}	-	100	-	
Continuous Source Current[1,5]	V_G=V_D=0V , Force Current	I_S	-	-	-5.7	A
Diode Forward Voltage[2]	V_{GS}=0V , I_S=-1A , T_J=25℃	V_{SD}	-	-	-1.2	V

Note :
1、The data tested by surface mounted on a 1 inch^2 FR-4 board with 2OZ copper.
2、The data tested by pulsed , pulse width ≦ 300us , duty cycle ≦ 2%
3、The EAS data shows Max. rating . The test condition is V_{DD}=-25V,V_{GS}=-10V,L=0.1mH,I_{AS}=-15A
4、The power dissipation is limited by 150℃ junction temperature
5 、The data is theoretically the same as I_D and I_{DM} , in real applications , should be limited by total power dissipation.

Download from alldatasheet.com

Ratings and Characteristic Curves

N-Typical Characteristics

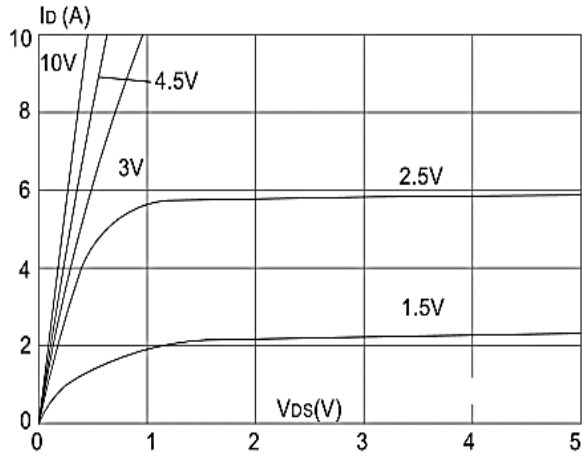


Figure1: Output Characteristics

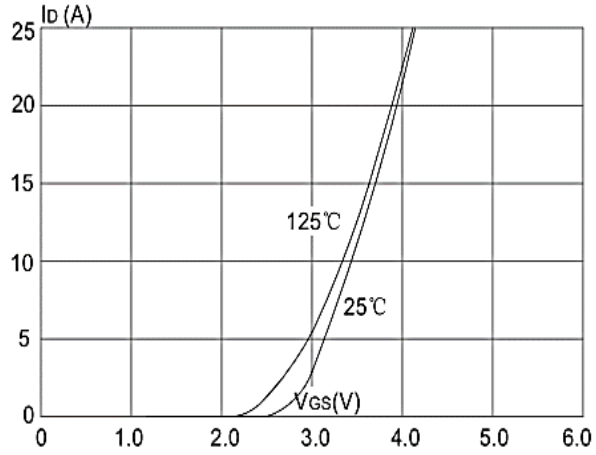


Figure 2: Typical Transfer Characteristics

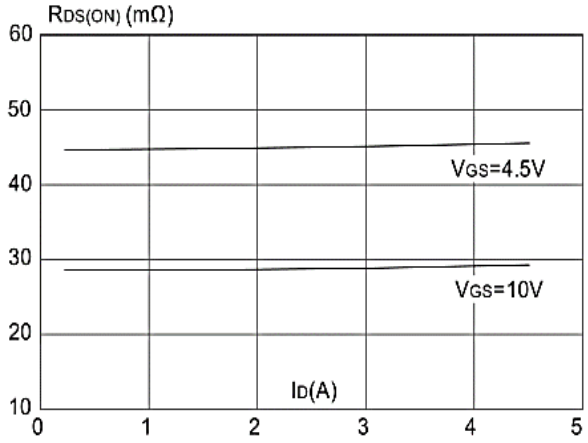


Figure 3:On-resistance vs. Drain Current

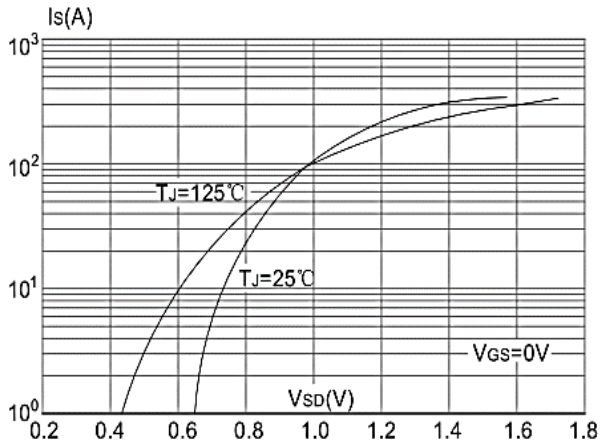


Figure 4: Body Diode Characteristics

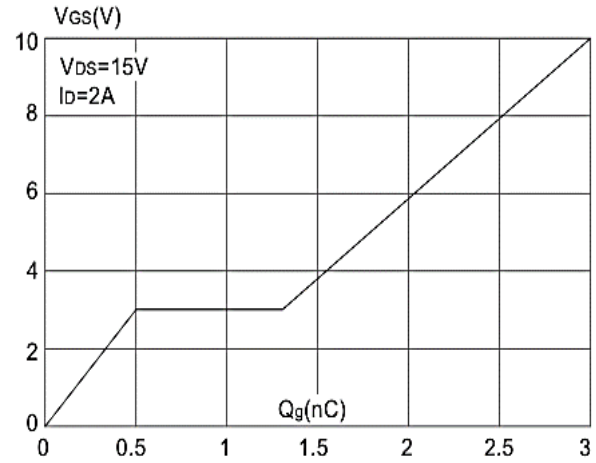


Figure 5: Gate Charge Characteristics

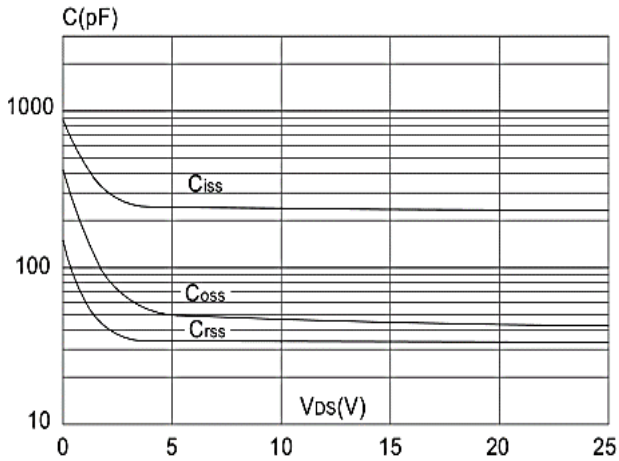


Figure 6: Capacitance Characteristics

Download from alldatasheet.com

Ratings and Characteristic Curves

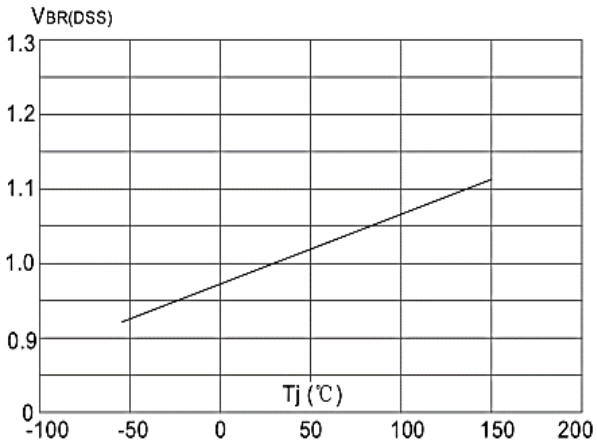


Figure 7: Normalized Breakdown Voltage vs. Junction Temperature

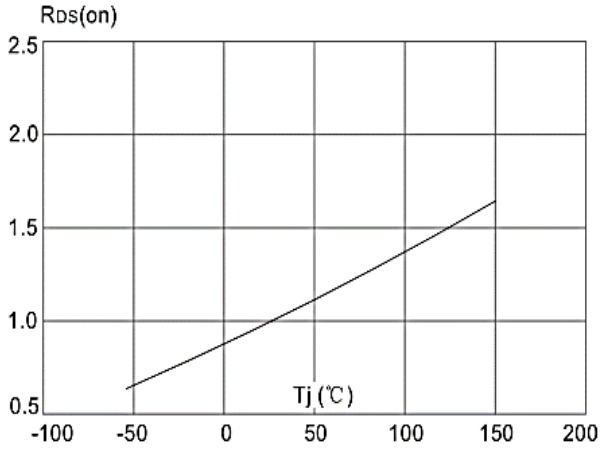


Figure 8: Normalized on Resistance vs Junction Temperature

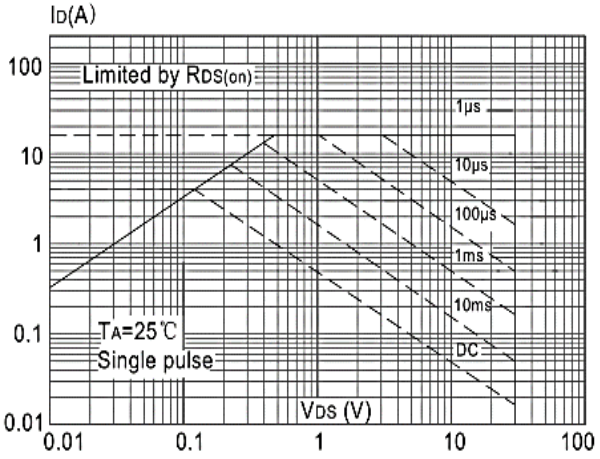


Figure 9: Maximum Safe Operating Area vs. Case Temperature

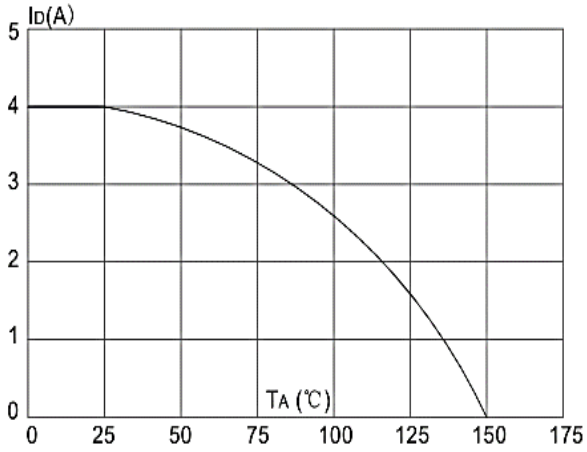


Figure 10: Maximum Continuous Drain Current

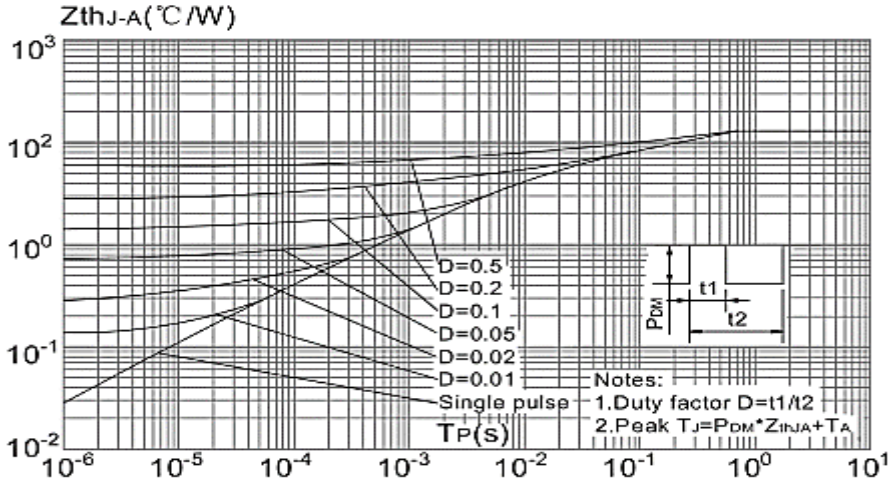


Figure.11: Maximum Effective Transient Thermal Impedance, Junction-to-Case

Download from alldatasheet.com

Ratings and Characteristic Curves

P-Typical Characteristics

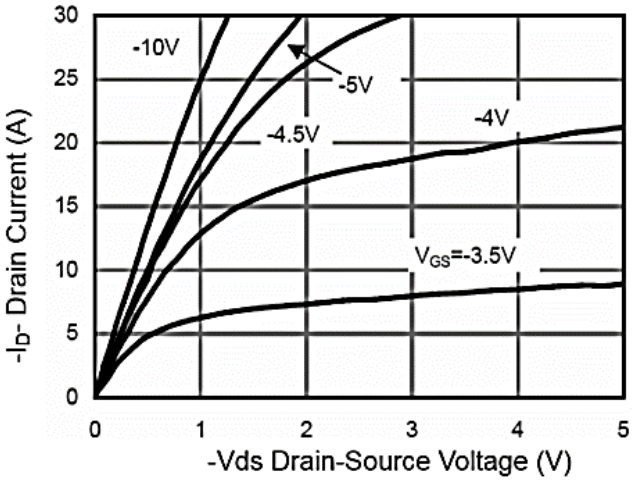


Figure 1 Output Characteristics

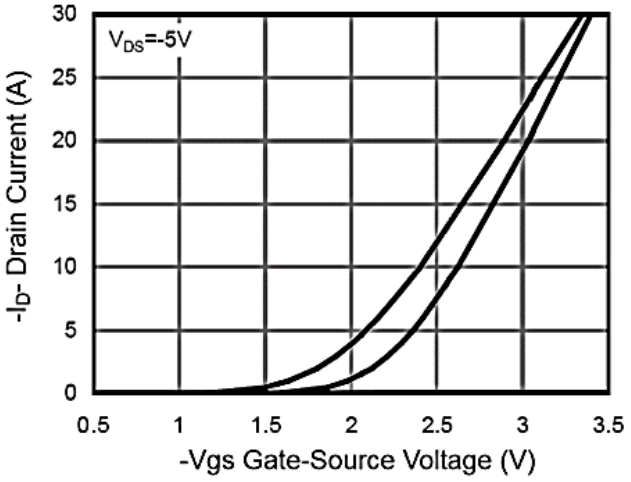


Figure 2 Transfer Characteristics

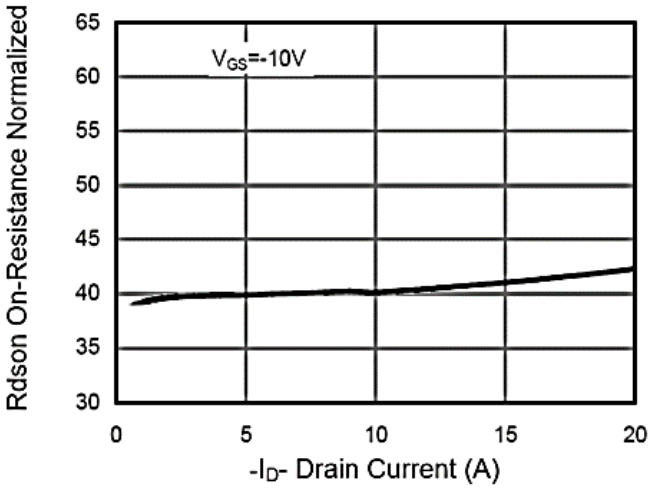


Figure 3 Rdson- Drain Current

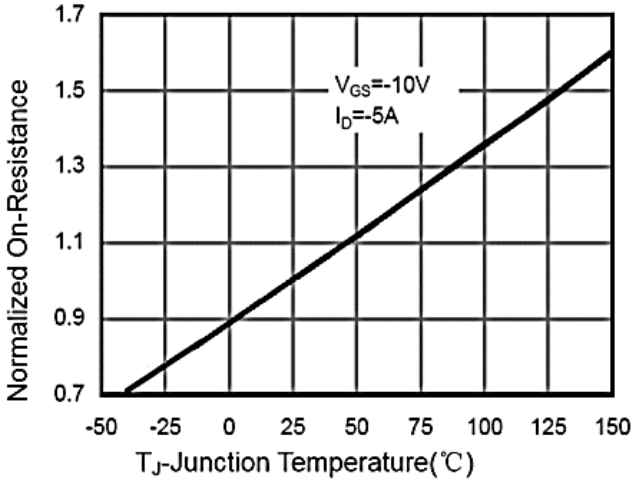


Figure 4 Rdson-Junction Temperature

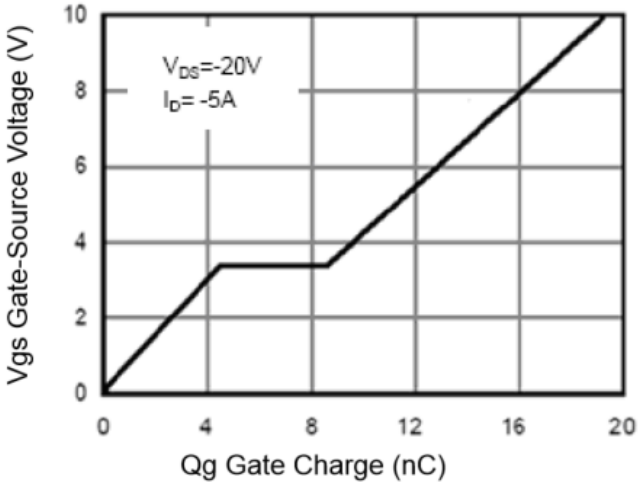


Figure 5 Gate Charge

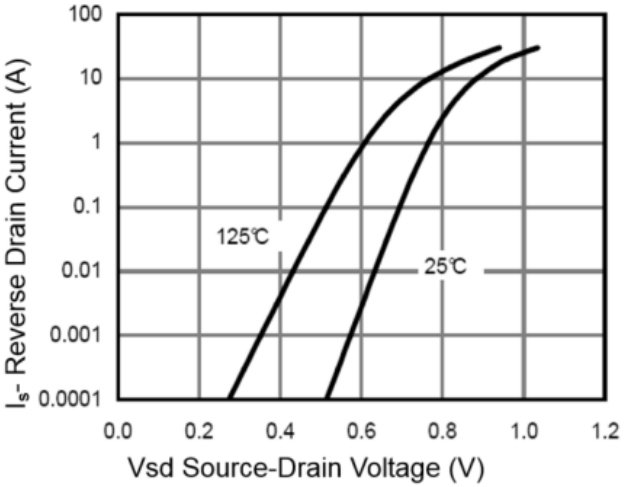


Figure 6 Source- Drain Diode Forward

Download from alldatasheet.com

Ratings and Characteristic Curves

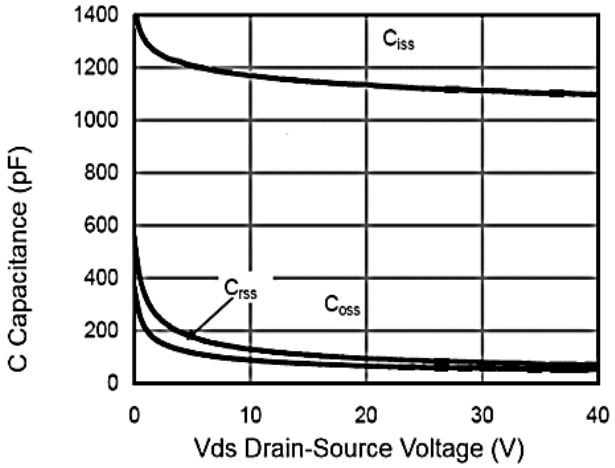


Figure 7 Capacitance vs Vds

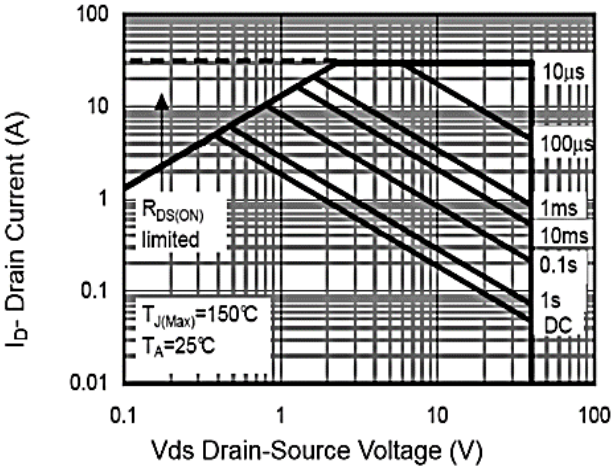


Figure 8 Safe Operation Area

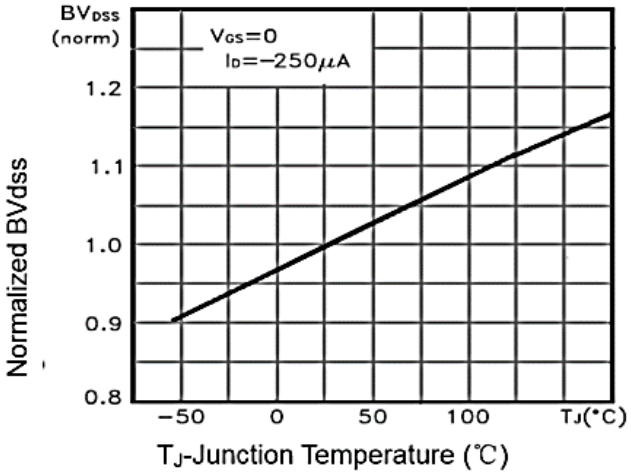


Figure 9 BV_{DSS} vs Junction Temperature

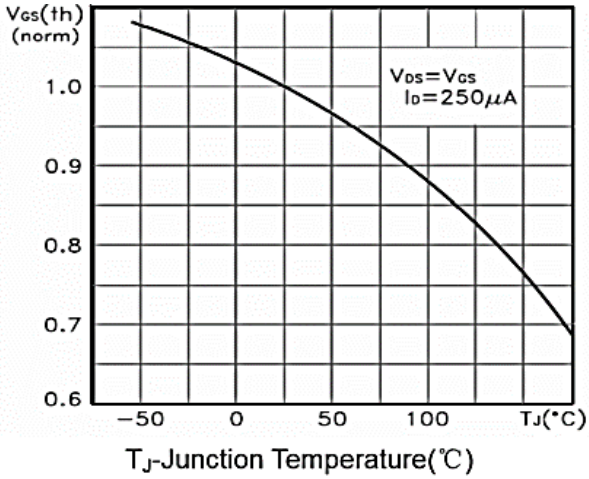


Figure 10 $V_{GS(th)}$ vs Junction Temperature

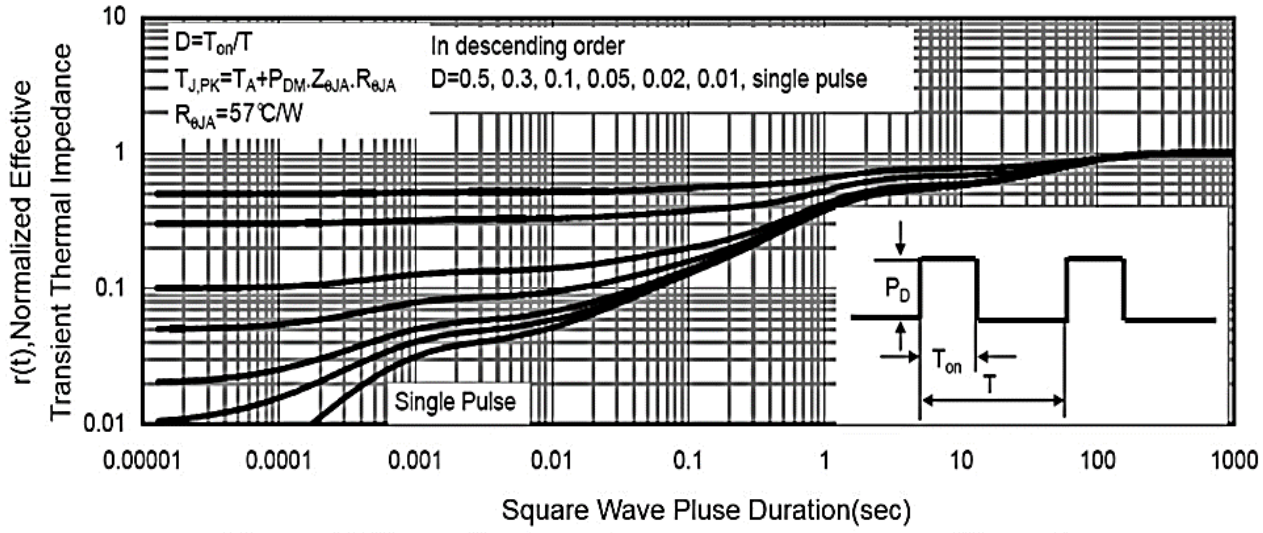
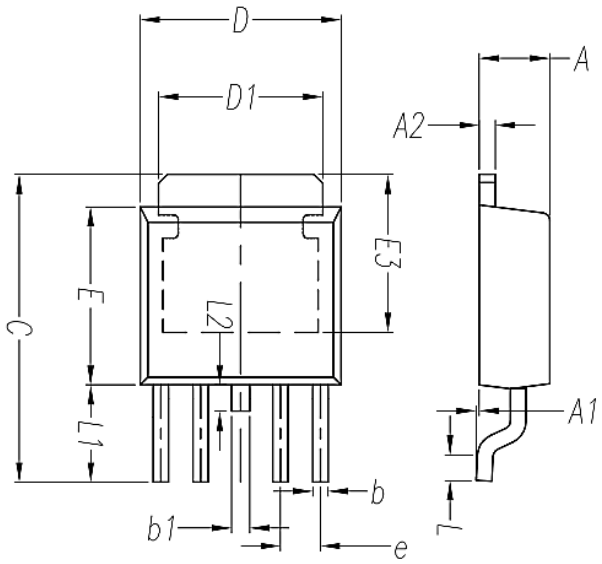


Figure 11 Normalized Maximum Transient Thermal Impedance

Download from alldatasheet.com

Package Outline Dimensions Millimeters

TO-252-4L



Symbol	Common		
	mm		
	Mim	Nom	Max
D	6.30	6.55	6.80
D1	4.80	5.35	5.90
C	9.70	10.00	10.30
E	5.90	6.10	6.30
E3	4.50	5.15	5.80
L	0.90	1.35	1.80
L1	2.60	2.85	3.05
L2	0.50	0.85	1.20
b	0.30	0.50	0.70
b1	0.40	0.60	0.80
A	2.10	2.30	2.50
A2	0.40	0.53	0.65
A1	0.00	0.10	0.20
e	1.17	1.27	1.37

Download from alldatasheet.com