UMW STD35P6LLF6

-60V P-Channel MOSFET

1.Features

- $V_{DS\ (V)}$=-60V
- $R_{DS(ON)}$<27mΩ(V_{GS}=-10V)
- $R_{DS(ON)}$<35mΩ(V_{GS}=-4.5V)
- Very low on-resistance
- Very low gate charge
- High avalanche ruggedness
- Low gate drive power loss

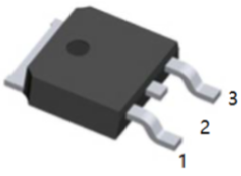
2.Applications

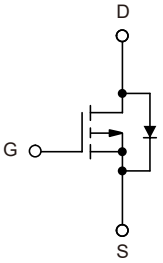
- Switching applications

3.Pinning information

Pin	Symbol	Description
1	G	GATE
2	D	DRAIN
3	S	SOURCE

TO-252(DPAK)
top view





4.Absolute Maximum Ratings T_A= 25°C

Parameter	Symbol	Value	Units
Drain-Source Voltage	V_{DS}	-60	V
Gate-Source Voltage	V_{GS}	±20	V
Drain current (continuous) at T_C=25°C	I_D	-35	A
Drain current (continuous) at T_C=100°C		-25	
Drain current (pulsed)	I_{DM}(1)	140	
Total dissipation at T_C=25°C	P_{TOT}	70	W
Storage temperature range	T_{STG}	-55 to 175	°C
Junction temperature range	T_J	-55 to 175	°C

Notes:

(1)Pulse width limited by safe operating area.

5.Thermal Resistance Rating

Parameter	Symbol	Value	Units
Thermal resistance junction-case max	$R_{thj\text{-}case}$	2.14	°C/W

6.Electrical characteristics(T_C= 25°C, unless otherwise specified)

Parameter	Symbol	Conditions	Min	Typ	Max	Units
Static						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	V_{GS}=0V, I_D=250μA	-60			V
Zero gate voltage drain current	I_{DSS}	V_{GS}=0V, V_{DS}=-60V			-1	μA
		V_{GS}=0V, V_{DS}=-60V, T_C=125°C(1)			-10	μA
Gate-body leakage current	I_{GSS}	V_{GS}=±20V, V_{DS}=0V			±100	nA
Gate threshold voltage	$V_{GS(th)}$	V_{DS}=V_{GS}, I_D=-250μA	-1.1	-1.8	-2.5	V
Static drain-source on-resistance	$R_{DS(ON)}$	V_{GS}=-10V, I_D=-17.5A		25	27	mΩ
		V_{GS}=-4.5V, I_D=-17.5A		30	35	mΩ
Dynamic						
Input Capacitance	C_{iss}	V_{DS}=-25V, V_{GS}=0V, f=1MHz		3780		pF
Output Capacitance	C_{oss}			262		pF
Reverse Transfer Capacitance	C_{rss}			170		pF
Total Gate Charge	Q_g	V_{DD}=-30V, I_D=-35A		30		nC
Gate-Source Charge	Q_{gs}	V_{GS} =0 to -4.5V(see Figure		10.8		nC
Gate-Drain Charge	Q_{gd}	14: "Gate charge test circuit")		10.5		nC
Gate input resistance	R_g	I_D=0A, gate DC bias=0V, f=1 MHz, magnitude of alternative signal=20mV		1.7		Ω
Switching times						
Turn-on delay time	$t_{D(on)}$	V_{DD}=-30V, I_D=-17.5A, R_G=4.7Ω, V_{GS}=-10V(see Figure 13: " Switching times test circuit for resistive load")		51.4		ns
Rise time	t_r			39		ns
Turn-off-delay time	$t_{D(off)}$			171		ns
Fall time	t_f			21		ns

Source drain diode						
Forward on voltage	V_{SD} (1)	V_{GS}=0V, I_{SD}=-35A			-1.5	V
Reverse recovery time	t_{rr}	I_{SD}=-35A, di/dt=100A/μs, V_{DD}=-48V, (see		34		ns
Reverse recovery charge	Q_{rr}	Figure 15: "Test circuit for inductive load		48		nC
Reverse recovery current	I_{RRM}	switching and diode recovery times")		-2.8		A

Notes:

(1)Pulse test: pulse duration = 300 μs, duty cycle 1.5%

7.1Typical Characterisitics

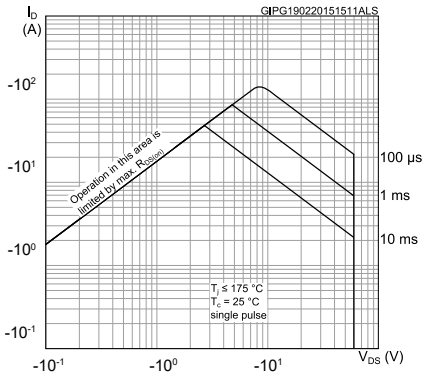


Figure 1: Safe operating area

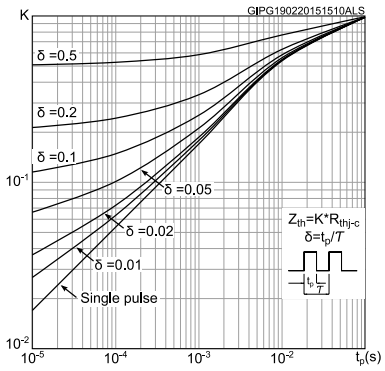


Figure 2: Thermal impedance

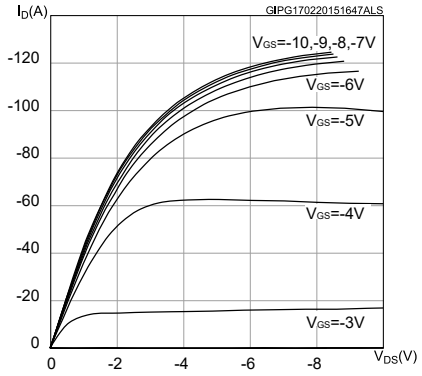


Figure 3: Output characteristics

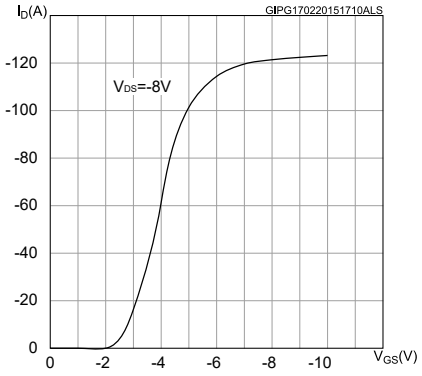


Figure 4: Transfer characteristics

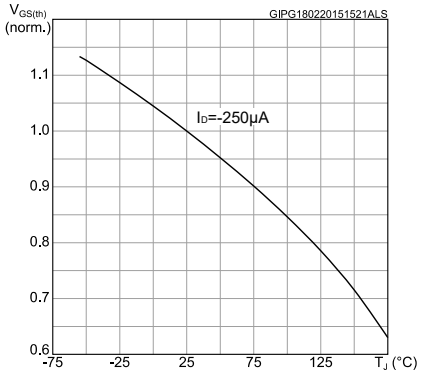


Figure 5: Normalized gate threshold voltage vs temperature

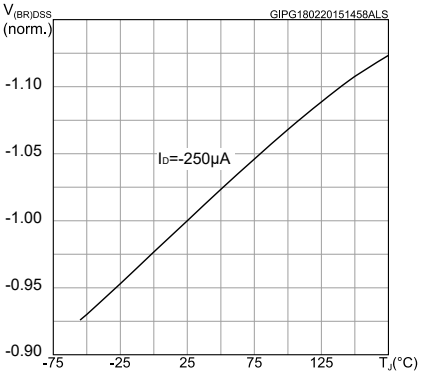


Figure 6: Normalized $V_{(BR)DSS}$ vs temperature

7.2Typical Characterisitics

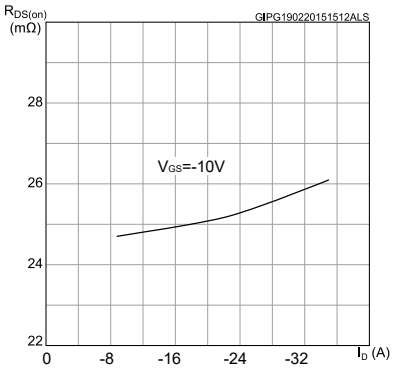


Figure 7: Static drain-source on-resistance

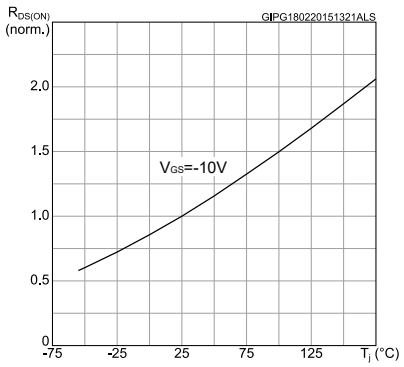


Figure 8: Normalized on-resistance vs. temperature

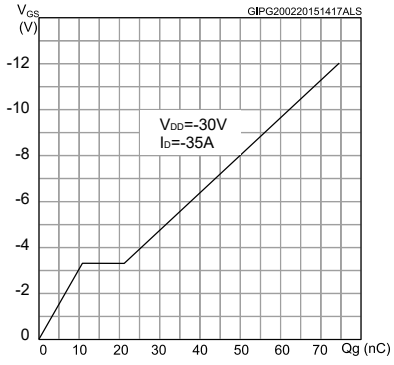


Figure 9: Gate charge vs gate-source voltage

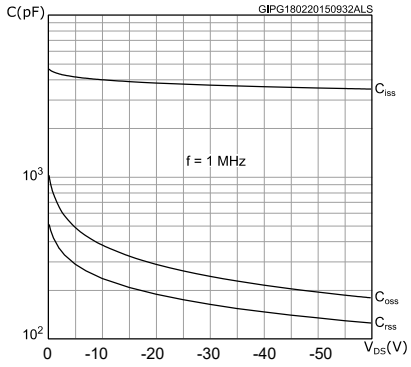


Figure 10: Capacitance variations voltage

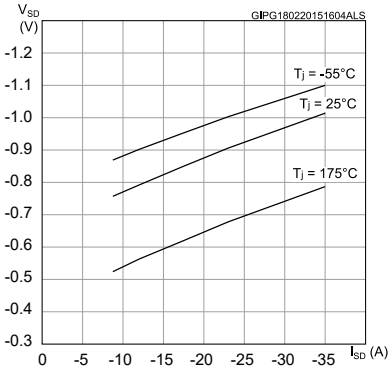
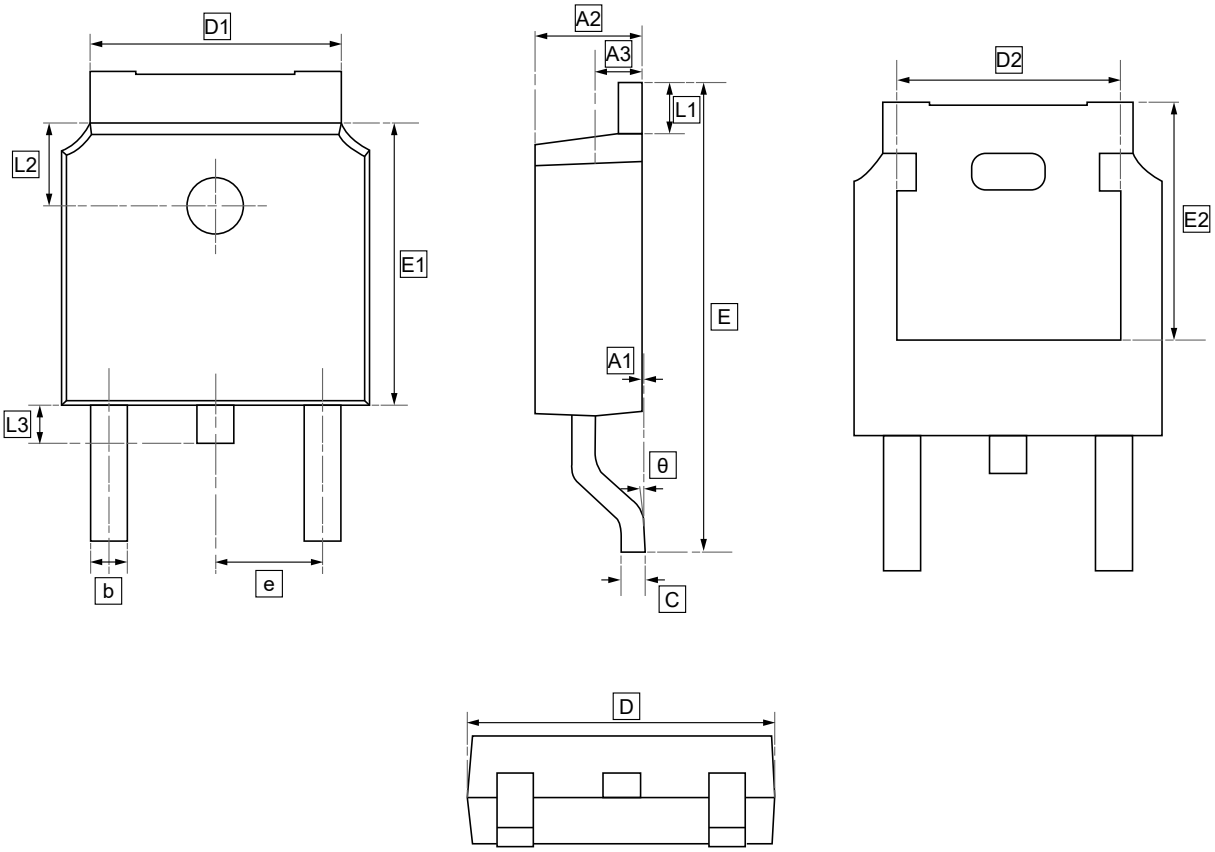


Figure 11: Source-drain diode forward characteristics

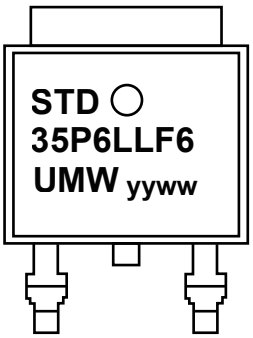
8.TO-252 Package Outline Dimensions



DIMENSIONS (mm are the original dimensions)

Symbol	A1	A2	A3	b	c	D	D1	D2	E	E1	E2	e	L1	L2	L3	θ
Min	0.00	2.18	0.90	0.65	0.46	6.35	4.95	4.32	9.40	5.97	5.21	2.286	0.89	1.70	0.60	0.00
Max	0.13	2.39	1.10	0.85	0.61	6.73	5.46	4.90	10.41	6.22	5.38	BSC	1.27	1.90	1.00	8.00

9.Ordering information



yy: Year Code
ww: Week Code

Order Code	Package	Base QTY	Delivery Mode
UMW STD35P6LLF6	TO-252	2500	Tape and reel

10.Disclaimer

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