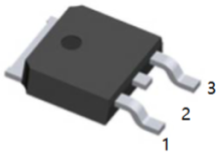
-60V P-Channel MOSFET

Features

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

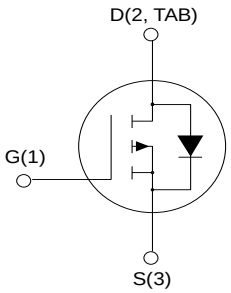


1.G 2.D 3.S

TO-252(DPAK) top view

Applications

- Switching applications



Electrical ratings

Table 2: Absolute maximum ratings

Symbol	Parameter	Value	Unit
V_{DS}	Drain-source voltage	60	V
V_{GS}	Gate-source voltage	± 20	V
I_D	Drain current (continuous) at T_C = 25 °C	35	A
I_D	Drain current (continuous) at T_C = 100 °C	25	A
I_{DM}(1)	Drain current (pulsed)	140	A
P_{TOT}	Total dissipation at T_C = 25 °C	70	W
T_{stg}	Storage temperature range	-55 to 175	°C
T_j	Operating junction temperature range		

Notes:

(1)Pulse width limited by safe operating area.

Table 3: Thermal data

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

Electrical characteristics

(T_C = 25 °C unless otherwise specified)

Table 4: Static

Symbol	Parameter	Test conditions	Min.	Typ.	Max.	Unit
$V_{(BR)DSS}$	Drain-source breakdown voltage	V_{GS} = 0 V, I_D = 250 µA	60			V
I_{DSS}	Zero gate voltage Drain current	V_{GS} = 0 V, V_{DS} = 60 V			1	µA
		V_{GS} = 0 V, V_{DS} = 60 V, T_C = 125 °C(1)			10	µA
I_{GSS}	Gate-body leakage current	V_{DS} = 0 V, V_{GS} = ± 20 V			±100	nA
$V_{GS(th)}$	Gate threshold voltage	V_{DS} = V_{GS}, I_D = 250 µA	-1.1	-1.8	-2.5	V
$R_{DS(on)}$	Static drain-source on-resistance	V_{GS} = 10 V, I_D = 17.5 A		25	27	mΩ
		V_{GS} = 4.5 V, I_D= 17.5 A		30	35	

Notes:

(1)Defined by design, not subject to production test.

Table 5: Dynamic

Symbol	Parameter	Test conditions	Min.	Typ.	Max.	Unit
C_{iss}	Input capacitance	V_{DS} = 25 V, f = 1 MHz, V_{GS} = 0 V		3780		pF
C_{oss}	Output capacitance			262		pF
C_{rss}	Reverse transfer capacitance			170		pF
Q_g	Total gate charge	V_{DD} = 30 V, I_D = 35 A, V_{GS} = 0 to 4.5 V (see Figure 14: "Gate charge test circuit")		30		nC
Q_{gs}	Gate-source charge			10.8		nC
Q_{gd}	Gate-drain charge			10.5		nC
R_G	Gate input resistance	I_D = 0 A, gate DC bias = 0 V, f = 1 MHz, magnitude of alternative signal = 20 mV		1.7		Ω

Table 6: Switching times

Symbol	Parameter	Test conditions	Min.	Typ.	Max.	Unit
$t_{d(on)}$	Turn-on delay time	V_{DD} = 30 V, I_D = 17.5 A R_G = 4.7 Ω, V_{GS} = 10 V (see Figure 13: "Switching times test circuit for resistive load")		51.4		ns
t_r	Rise time			39		ns
$t_{d(off)}$	Turn-off-delay time			171		ns
t_f	Fall time			21		ns

Table 7: Source drain diode

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

Notes:

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

Electrical characteristics (curves)

Figure 2: Safe operating area

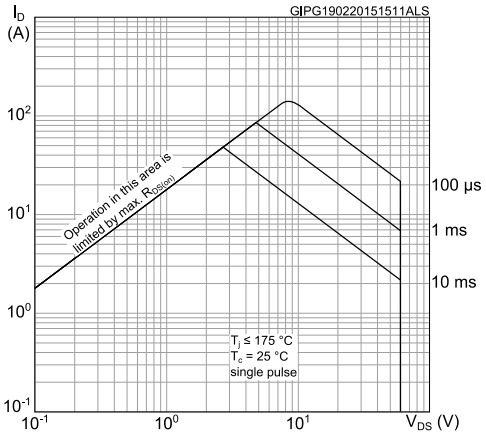


Figure 3: Thermal impedance

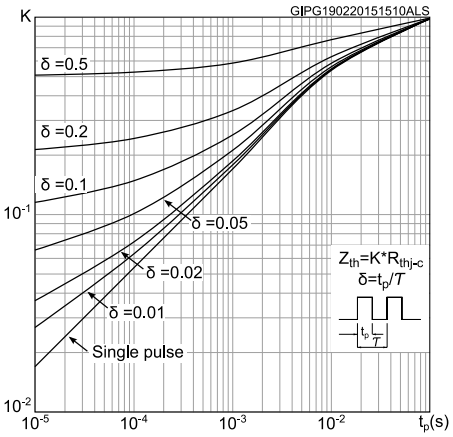


Figure 4: Output characteristics

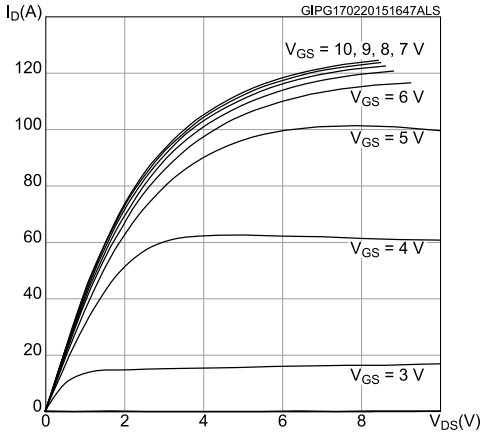


Figure 5: Transfer characteristics

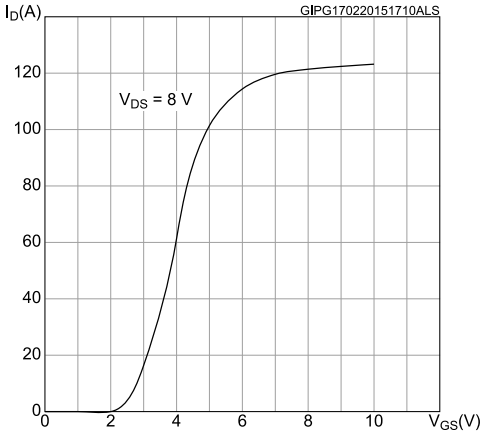


Figure 6: Normalized gate threshold voltage vs temperature

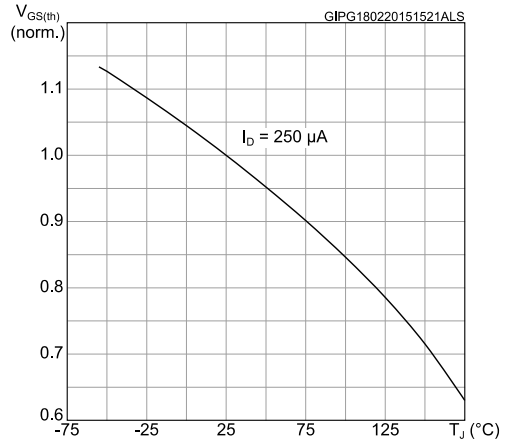


Figure 7: Normalized V(BR)DSS vs temperature

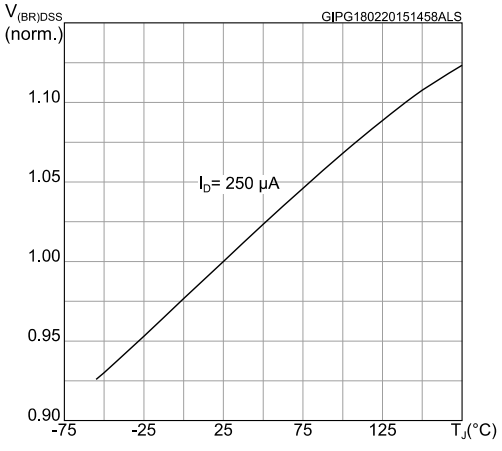


Figure 8: Static drain-source on-resistance

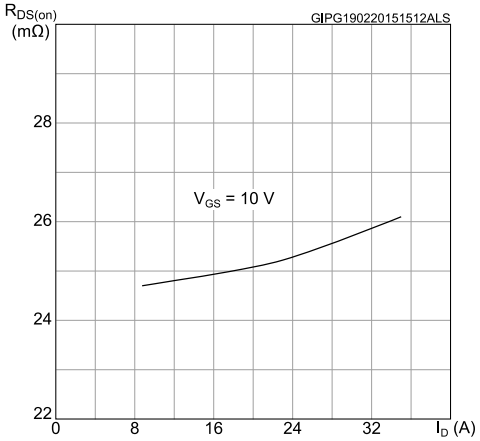


Figure 9: Normalized on-resistance vs. temperature

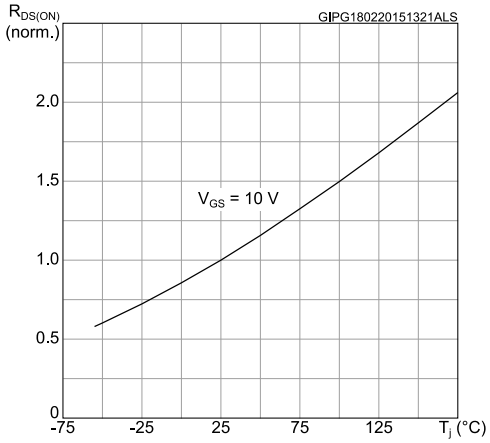


Figure 10: Gate charge vs gate-source voltage

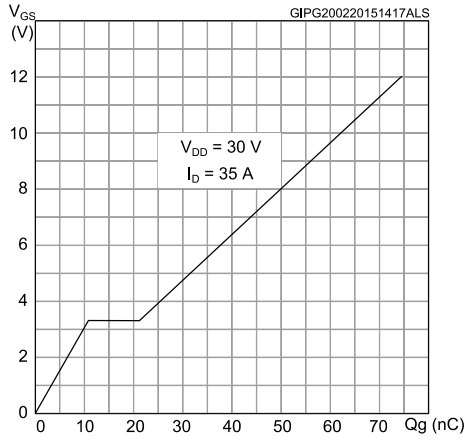


Figure 11: Capacitance variations voltage

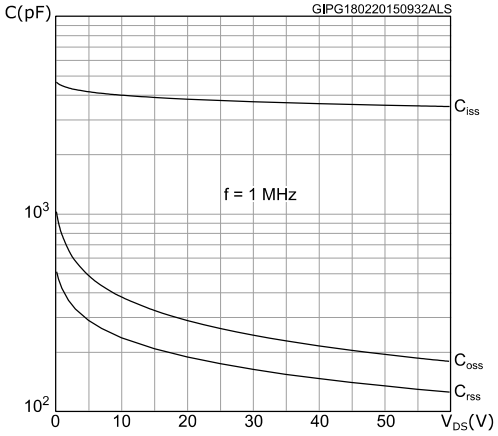
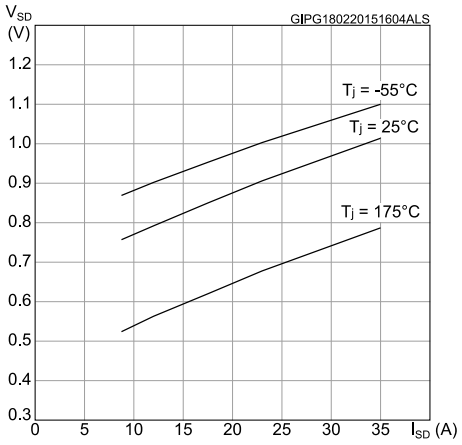
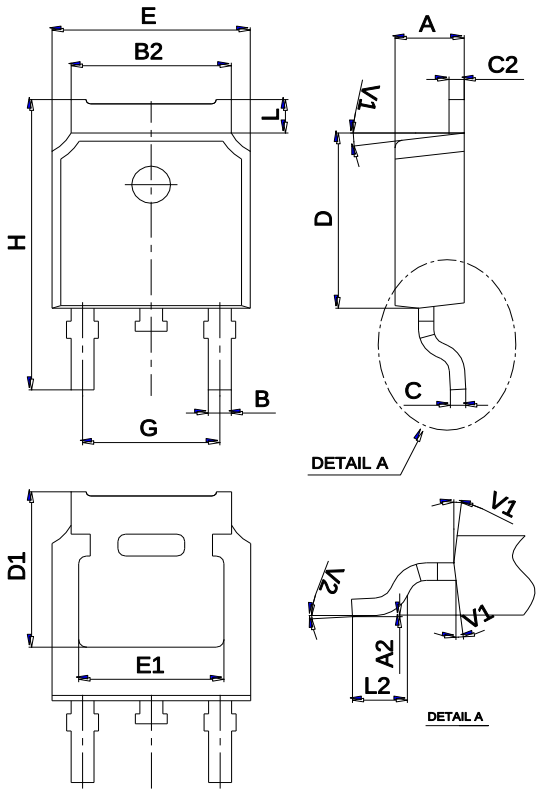


Figure 12: Source-drain diode forward characteristics



Package Mechanical Data TO-252



Ref.	Dimensions					
	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A	2.10		2.50	0.083		0.098
A2	0		0.10	0		0.004
B	0.66		0.86	0.026		0.034
B2	5.18		5.48	0.202		0.216
C	0.40		0.60	0.016		0.024
C2	0.44		0.58	0.017		0.023
D	5.90		6.30	0.232		0.248
D1	5.30REF			0.209REF		
E	6.40		6.80	0.252		0.268
E1	4.63			0.182		
G	4.47		4.67	0.176		0.184
H	9.50		10.70	0.374		0.421
L	1.09		1.21	0.043		0.048
L2	1.35		1.65	0.053		0.065
V1		7°			7°	
V2	0°		6°	0°		6°

Marking

Ordering information

Order code	Package	Baseqty	Deliverymode
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