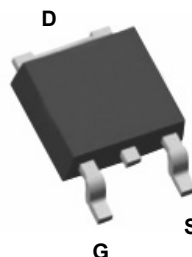
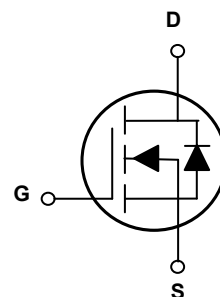


Main Product Characteristics

V_{DS}	150V
$R_{DS(ON)}$	56m Ω (Typ.)
I_D	20A



TO-252 (DPAK)



Schematic Diagram

Features and Benefits

- Advanced MOSFET process technology
- Ideal for high efficiency switched mode power supplies
- Low on-resistance with low gate charge
- Fast switching and reverse body recovery



Description

The GSGD1520AK utilizes the latest techniques to achieve high cell density and low on-resistance. These features make this device extremely efficient and reliable for use in high efficiency switch mode power supply and a wide variety of other applications.

Absolute Maximum Ratings ($T_A=25^{\circ}\text{C}$ unless otherwise specified)

Parameter	Symbol	Max.	Unit
Drain-Source Voltage	V_{DS}	150	V
Gate-Source Voltage	V_{GS}	± 20	V
Drain Current-Continuous	I_D	20	A
Drain Current-Continuous ($T_C=100^{\circ}\text{C}$)		14	
Drain Current-Pulsed	I_{DM}	80	A
Single Pulse Avalanche Energy ⁵	E_{AS}	30	mJ
Maximum Power Dissipation	P_D	68	W
Derating Factor		0.45	
Drain Source Voltage Slope, $V_{DS} \leq 150\text{V}$	dv/dt	50	V/ns
Reverse Diode dv/dt , $V_{DS} \leq 150\text{V}$, $I_{SD} < I_D$	dv/dt	10	V/ns
Thermal Resistance, Junction-to-Case ²	$R_{\theta JC}$	2.2	$^{\circ}\text{C/W}$
Operating Junction Temperature Range	T_J	-55 To +175	$^{\circ}\text{C}$
Storage Temperature Range	T_{STG}	-55 To +175	$^{\circ}\text{C}$

Electrical Characteristics ($T_A=25^{\circ}\text{C}$ unless otherwise specified)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Off Characteristics						
Drain-Source Breakdown Voltage	BV _{DSS}	V _{GS} =0V, I _D =250μA	150	-	-	V
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} =150V, V _{GS} =0V	-	-	1	μA
Gate-Source Leakage Current	I _{GSS}	V _{GS} =±20V, V _{DS} =0V	-	-	±100	nA
On Characteristics						
Gate Threshold Voltage ³	V _{GS(th)}	V _{GS} =V _{DS} , I _D =250μA	1.3	1.9	2.5	V
Static Drain-Source On-Resistance ³	R _{DS(ON)}	V _{GS} =10V, I _D =10A	-	56	62	mΩ
		V _{GS} =4.5V, I _D =10A	-	68	82	
Gate Resistance ³	R _G	-	-	10	-	Ω
Forward Transconductance ³	g _{fs}	V _{DS} =5V, I _D =10A	-	15	-	S
Dynamic and Switching Characteristics						
Input Capacitance ⁴	C _{iss}	V _{DS} =75V, V _{GS} =0V, F=1MHz	-	799	-	pF
Output Capacitance ⁴	C _{oss}		-	74.4	-	
Reverse Transfer Capacitance ⁴	C _{rss}		-	11.1	-	
Turn-On Delay Time ⁴	t _{d(on)}	V _{DD} =75V, R _L =7.5Ω, R _G =3Ω, V _{GS} =10V	-	10.5	-	nS
Turn-On Rise Time ⁴	t _r		-	6	-	
Turn-Off Delay Time ⁴	t _{d(off)}		-	14.5	-	
Turn-Off Fall Time ⁴	t _f		-	3.5	-	
Total Gate Charge ⁴	Q _g	V _{DS} =75V, I _D =10A, V _{GS} =10V	-	15	-	nC
Gate-Source Charge ⁴	Q _{gs}		-	4.5	-	
Gate-Drain Charge ⁴	Q _{gd}		-	3	-	
Drain-Source Diode Characteristics						
Diode Forward Current ²	I _S	-	-	-	20	A
Diode Forward Voltage ³	V _{SD}	V _{GS} =0V, I _S =10A	-	-	1.2	V
Reverse Recovery Time	t _{rr}	I _F =I _S , T _J =25°C di/dt=100A/μs ³	-	29.5	-	nS
Reverse Recovery Charge	Q _{rr}		-	132	-	nC

Notes:

1. Repetitive Rating: Pulse width limited by maximum junction temperature.
2. Surface Mounted on FR4 Board, $t \leq 10$ sec.
3. Pulse Test: Pulse Width $\leq 300\mu s$, Duty Cycle $\leq 2\%$.
4. Guaranteed by design.
5. EAS condition: $T_J=25^{\circ}\text{C}$, $V_{DD}=50V$, $V_G=10V$, $L=0.5mH$, $R_g=25\Omega$.

Typical Electrical and Thermal Characteristic Curves

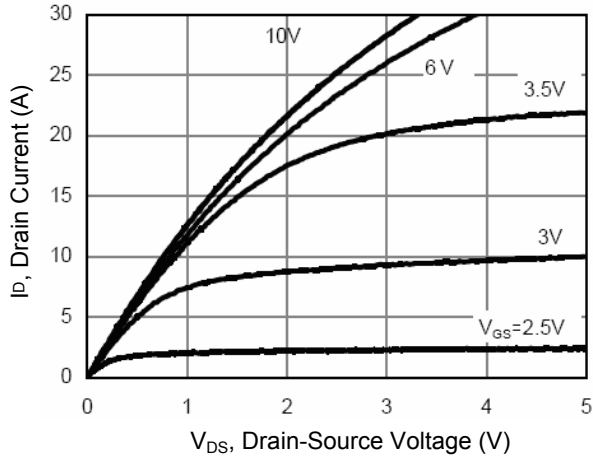


Figure 1. Output Characteristics

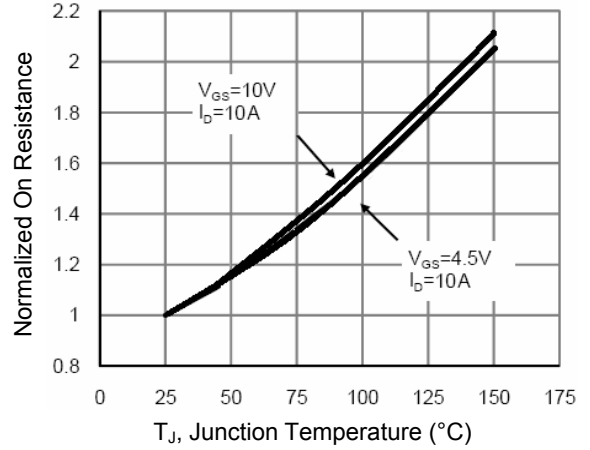


Figure 2. $R_{DS(on)}$ -Junction Temperature

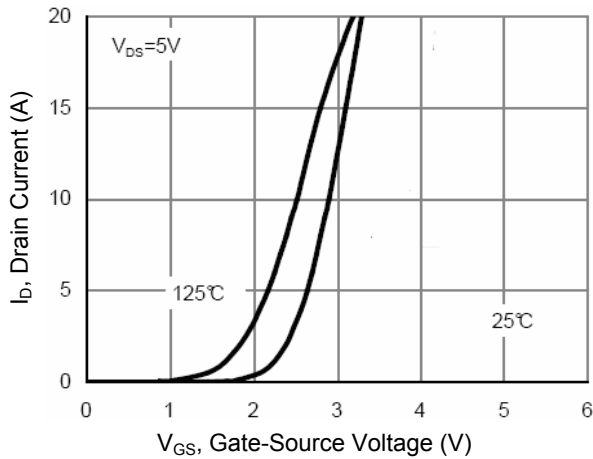


Figure 3. Transfer Characteristics

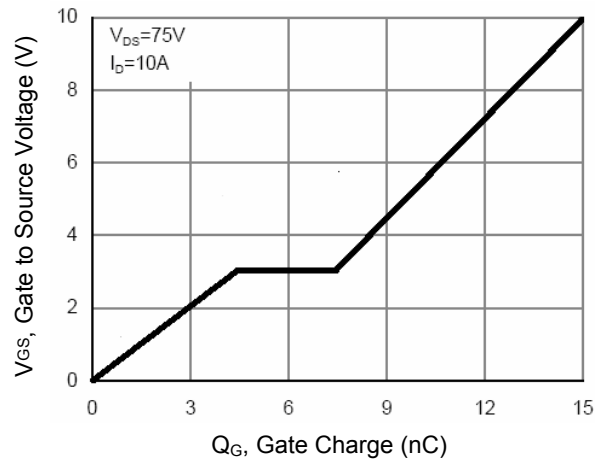


Figure 4. Gate Charge Waveform

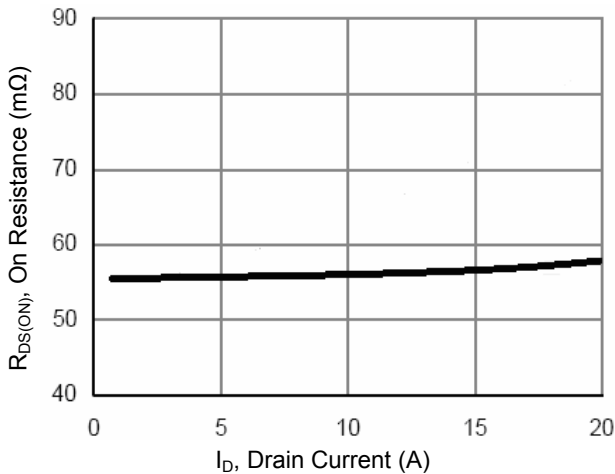


Figure 5. $R_{DS(on)}$ -Drain Current

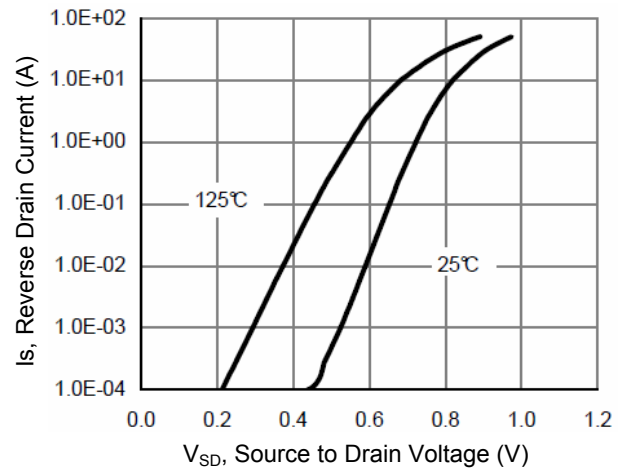


Figure 6. Source-Drain Diode Forward

Typical Electrical and Thermal Characteristic Curves

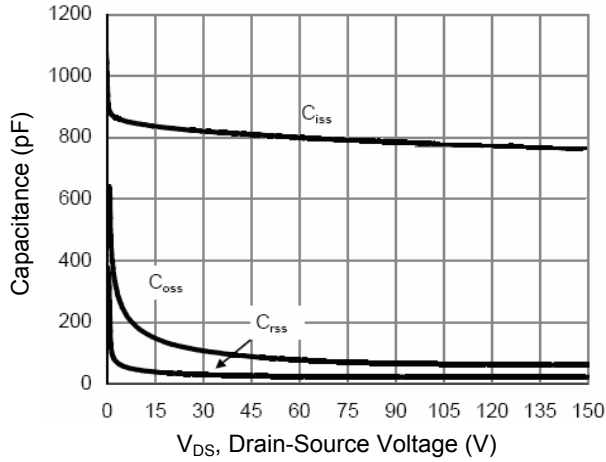


Figure 7. Capacitance vs. V_{DS}

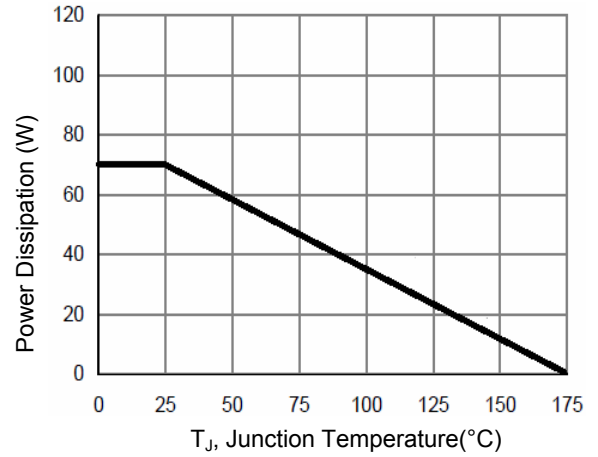


Figure 8. Power De-rating

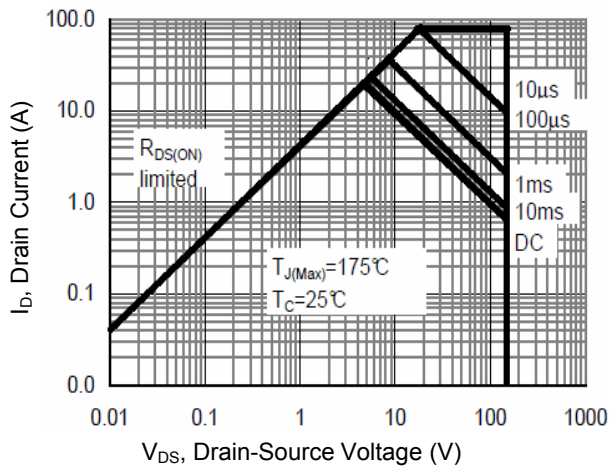


Figure 9. Safe Operation Area

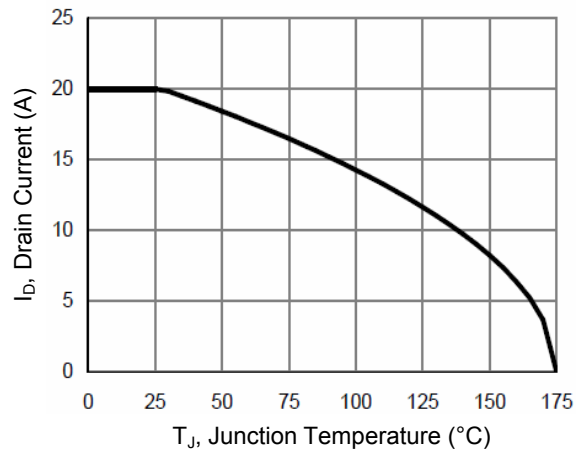


Figure 10. Current De-rating

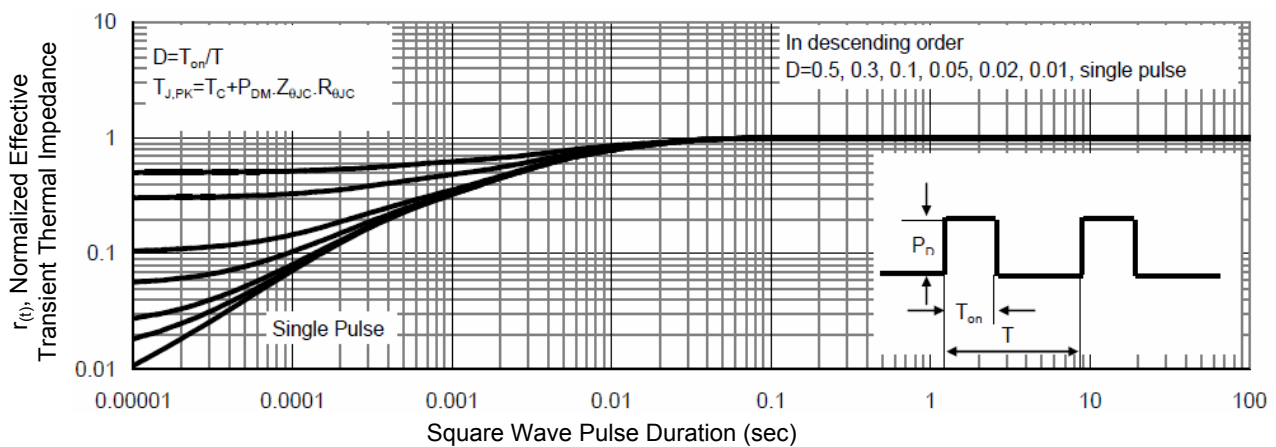
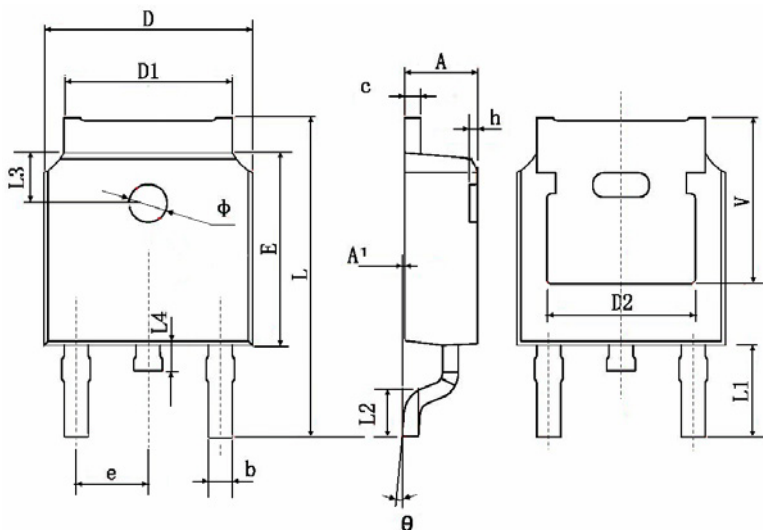


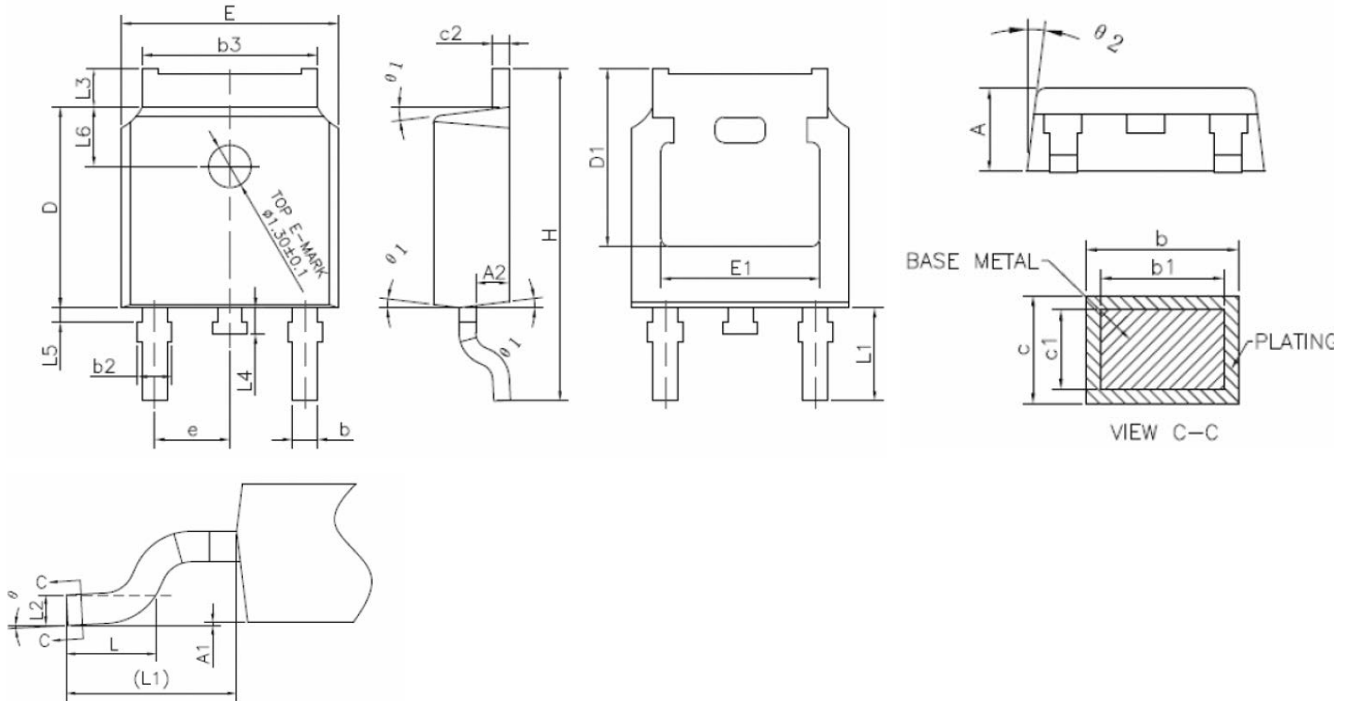
Figure 11. Normalized Maximum Transient Thermal Impedance

Package Outline Dimensions TO-252 (DPAK)



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	2.20	2.40	0.09	0.10
A1	0.00	0.127	0.00	0.005
b	0.66	0.86	0.03	0.04
c	0.46	0.58	0.02	0.03
D	6.50	6.70	0.26	0.27
D1	5.10	5.46	0.20	0.21
D2	4.83 TYP		0.19 TYP	
E	6.00	6.20	0.24	0.25
e	2.19	2.386	0.09	0.094
L	9.80	10.40	0.39	0.41
L1	2.90 TYP		0.11 TYP	
L2	1.40	1.70	0.06	0.07
L3	1.60 TYP		0.06 TYP	
L4	0.60	1.00	0.02	0.04
Φ	1.10	1.30	0.04	0.05
θ	0°	8°	0°	8°
h	0.00	0.30	0.00	0.01
V	5.35 TYP		0.21 TYP	

Package Outline Dimensions TO-252 (DPAK)



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	2.200	2.380	0.087	0.094
A1	0.000	0.100	0.000	0.004
A2	0.900	1.100	0.035	0.043
b	0.720	0.850	0.028	0.033
b1	0.710	0.810	0.028	0.032
b2	0.720	0.900	0.028	0.035
b3	5.130	5.460	0.202	0.215
c	0.470	0.600	0.019	0.024
c1	0.460	0.560	0.018	0.022
c2	0.470	0.600	0.019	0.024
D	6.000	6.200	0.236	0.244
D1	5.250	-	0.207	-
E	6.500	6.700	0.256	0.264
E1	4.700	-	0.185	-
e	2.186	2.386	0.086	0.094
H	9.800	10.400	0.386	0.409
L	1.400	1.700	0.055	0.067
L1	2.900 REF		0.114 REF	
L2	0.508 BSC		0.020 BSC	
L3	0.900	1.250	0.035	0.049
L4	0.600	1.000	0.024	0.039
L5	0.150	0.750	0.006	0.030
L6	1.800 REF		0.071 REF	
θ	0°	8°	0°	8°
θ1	5°	9°	5°	9°
θ2	5°	9°	5°	9°

For more information, please contact us at: inquiry@goodarksemi.com