

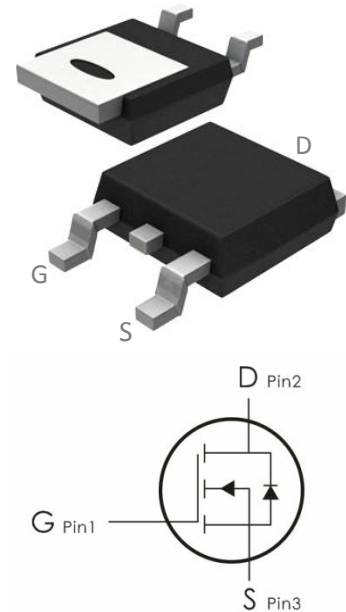
Description:

This N-Channel MOSFET uses advanced trench technology and design to provide excellent $R_{DS(on)}$ with low gate charge.

It can be used in a wide variety of applications.

Features:

- 1) $V_{DS}=40V, I_D=120A, R_{DS(on)} < 3.5m\Omega @ V_{GS}=10V$
- 2) Low gate charge.
- 3) Green device available.
- 4) Advanced high cell density trench technology for ultra low $R_{DS(on)}$.
- 5) Excellent package for good heat dissipation.



Absolute Maximum Ratings: ($T_C=25^\circ C$ unless otherwise noted)

Symbol	Parameter	Ratings	Units
V_{DS}	Drain-Source Voltage	40	V
V_{GS}	Gate-Source Voltage	± 20	V
I_D	Continuous Drain Current- $T_C=25^\circ C^3$	120	A
	Continuous Drain Current- $T_C=100^\circ C$	78	A
I_{DM}	Pulsed Drain Current ¹	480	A
P_D	Power Dissipation	108	W
E_{AS}	Single pulse avalanche energy ²	160	mJ
T_J, T_{STG}	Operating and Storage Junction Temperature Range	-55 to +150	$^\circ C$

Thermal Characteristics:

Symbol	Parameter	Max	Units
$R_{\theta JC}$	Thermal Resistance, Junction to Case	1.4	$^\circ C/W$

Package Marking and Ordering Information:

Part NO.	Marking	Package
DOD120N04	120N04	TO-252

Electrical Characteristics: ($T_C=25^{\circ}\text{C}$ unless otherwise noted)

Symbol	Parameter	Conditions	Min	Typ	Max	Units
Off Characteristics						
BV _{DSS}	Drain-Sourctce Breakdown Voltage	V _{GS} =0V, I _D =250 μ A	40	---	---	V
I _{DSS}	Zero Gate Voltage Drain Current	V _{DS} =40V, V _{GS} =0V	---	---	1	μ A
I _{GSS}	Gate-Source Leakage Current	V _{GS} =± 20V, V _{DS} =0A	---	---	± 100	nA
On Characteristics						
V _{GS(th)}	Gate Source Threshold Voltage	V _{GS} =V _{DS} , I _D =250 μ A	1	1.6	2.5	V
R _{DS(ON)}	Drain-Source On Resistanc ³	V _{GS} =10V, I _D =30A	---	2.8	3.5	m Ω
		V _{GS} =4.5V, I _D =20A	---	3.5	4.5	
Dynamic Characteristics						
C _{iss}	Input Capacitance	V _{DS} =20V, V _{GS} =0V, f=1MHz	---	5594	---	pF
C _{OSS}	Output Capacitance		---	410	---	
C _{rss}	Reverse Transfer Capacitance		---	339	---	
Switching Characteristics						
t _{d(on)}	Turn-On Delay Time	VDD=20V R _{GEN} =3Ω , I _D =30A	---	11	---	ns
t _r	Rise Time		---	15	---	ns
t _{d(off)}	Turn-Off Delay Time		---	38	---	ns
t _f	Fall Time		---	14	---	ns
Q _g	Total Gate Charge	V _{GS} =10V, V _{DS} =20V, I _D =30A	---	64	---	nC
Q _{gs}	Gate-Source Charge		---	12.4	---	nC
Q _{gd}	Gate-Drain “Miller” Charge		---	14	---	nC
Drain-Source Diode Characteristics						
I _S	Continuous Source Current	VG=VD=0V	---	---	120	A
I _{SM}	Pulsed Drain Current	VG=VD=0V	---	---	480	A

V_{SD}	Diode Forward Voltage	V _{GS} =0V , I _D =30A	---	---	1.2	V
T_{rr}	Reverse Recovery Time	I _F =30A , dI/dt=100A/μs ,	---	22	---	ns
Q_{rr}	Reverse Recovery Charge		---	11	---	nC

Notes:

1. Repetitive Rating: Pulse Width Limited by Maximum Junction Temperature
2. EAS condition: T_J=25°C , V_{DD}=20V, V_G=10V, R_G=25Ω, L=0.5mH, I_{AS}=25.3A
3. Pulse Test: Pulse Width≤300μs, Duty Cycle≤0.5%

Typical Characteristics:

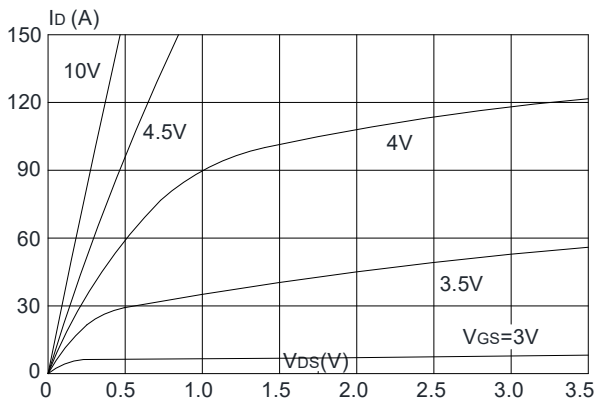


Figure 1: Output Characteristics

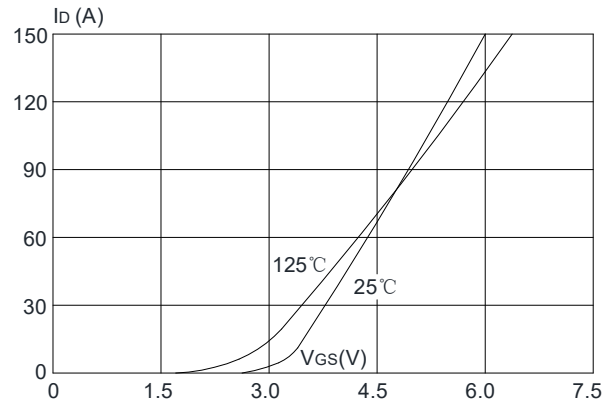


Figure 2: Typical Transfer Characteristics

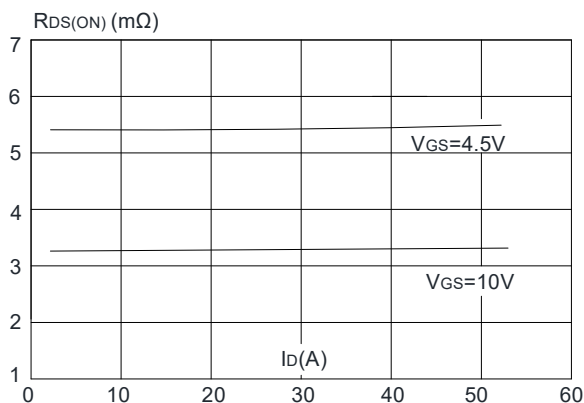


Figure 3: On-resistance vs. Drain Current

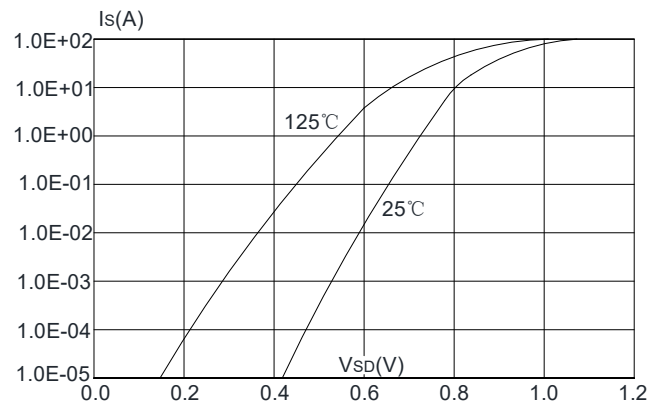


Figure 4: Body Diode Characteristics

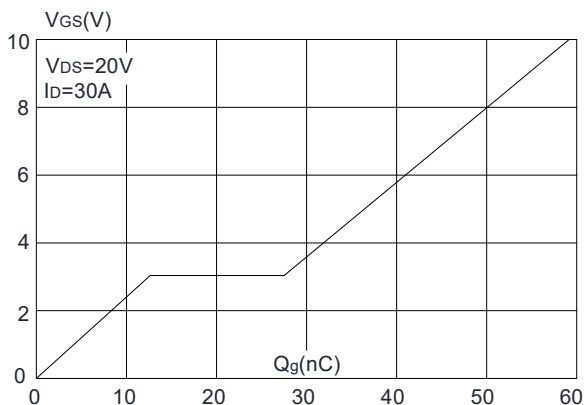


Figure 5: Gate Charge Characteristics

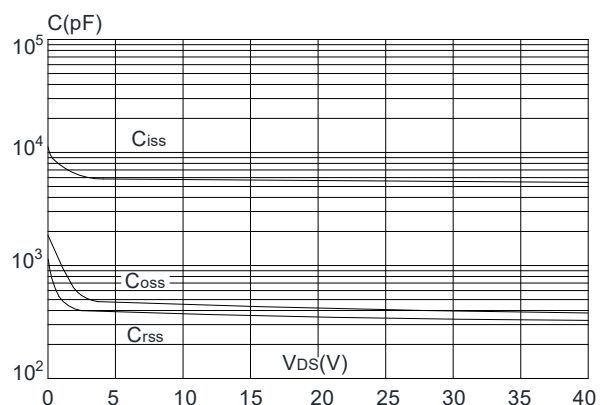


Figure 6: Capacitance Characteristics

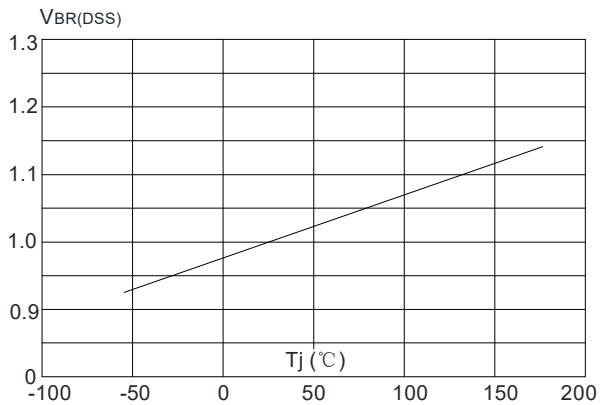


Figure 7: Normalized Breakdown Voltage vs. Junction Temperature

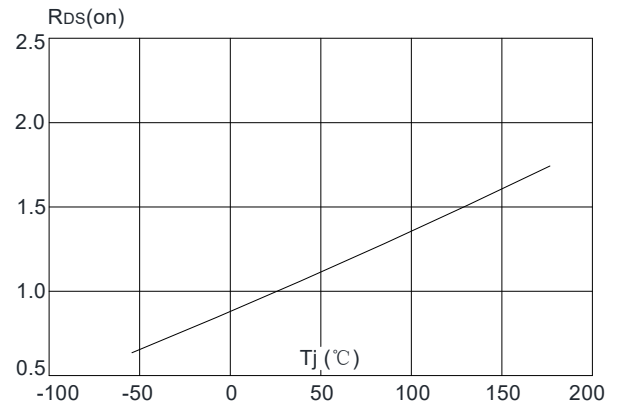


Figure 8: Normalized on Resistance vs. Junction Temperature

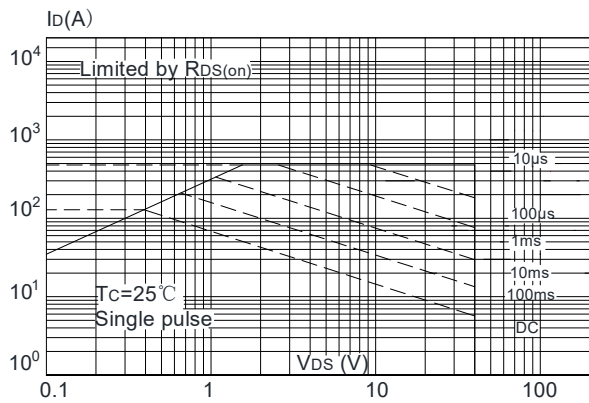


Figure 9: Maximum Safe Operating Area

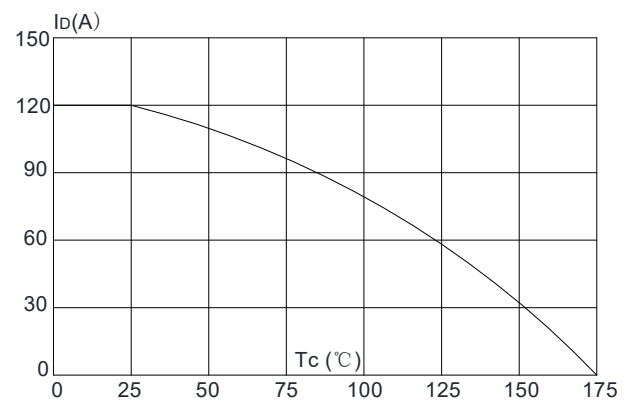


Figure 10: Maximum Continuous Drain Current vs. Case Temperature

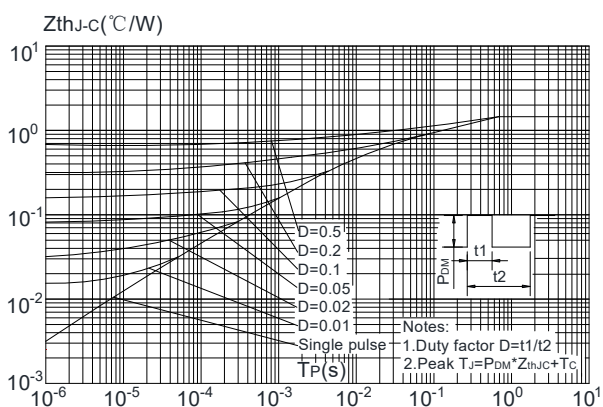


Figure.11: Maximum Effective Transient Thermal Impedance, Junction-to-Case