

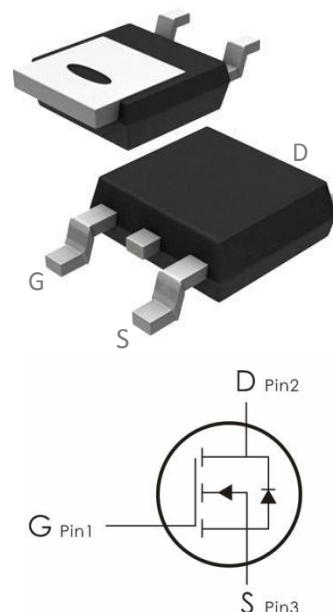
Description:

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) $V_{DS}=40V, I_D=75A, R_{DS(ON)}<6.2m\ \Omega @V_{GS}=10V$
- (2) Lead free and Green Device Available
- (3) Excellent $R_{DS(ON)}$ and Low Gate Charge
- (4) Lead free product is acquired



Absolute Maximum Ratings: ($T_C=25^\circ\text{C}$ 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- $T_C=25^\circ\text{C}$	75	A
	Continuous Drain Current- $T_C=100^\circ\text{C}$	46	A
I_{DM}	Pulsed Drain Current ^{note1}	280	A
E_{AS}	Single Pulsed Avalanche Energy ^{note2}	96	mJ
P_D	Power Dissipation- $T_C=25^\circ\text{C}$	58	W
T_J, T_{STG}	Operating and Storage Junction Temperature Range	-55 to +175	$^\circ\text{C}$

Thermal Characteristics:

Symbol	Parameter	Max	Units
$R_{\theta JC}$	Thermal Resistance, Junction to Case	2.6	$^\circ\text{C}/\text{W}$

Package Marking and Ordering Information:

Part NO.	Marking	Package
DOD2146	D2146	TO-252

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

Symbol	Parameter	Conditions	Min	Typ	Max	Units
Off Characteristics						
BV_{DSS}	Drain-Source Breakdown Voltage	$V_{GS}=0V, I_D=250\ \mu A$	40	---	---	V
I_{DSS}	Zero Gate Voltage Drain Current	$V_{DS}=40V, V_{GS}=0V,$	---	---	1.0	μA
I_{GSS}	Gate-Source Leakage Current	$V_{GS}=\pm 20V, V_{DS}=0A$	---	---	± 100	nA

On Characteristics						
$V_{GS(th)}$	GATE-Source Threshold Voltage	$V_{GS}=V_{DS}, I_D=250\ \mu A$	1.0	1.5	2.5	V
$R_{DS(on)}$	Drain-Source On Resistance ²	$V_{GS}=10V, I_D=30A$	---	4.8	6.2	$m\ \Omega$
		$V_{GS}=4.5V, I_D=20A$	---	7.2	11	$m\ \Omega$

Dynamic Characteristics						
C_{iss}	Input Capacitance	$V_{DS}=20V, V_{GS}=0V, f=1MHz$	---	2950	---	pF
C_{oss}	Output Capacitance		---	220	---	
C_{rss}	Reverse Transfer Capacitance		---	190	---	

Switching Characteristics						
$t_{d(on)}$	Turn-On Delay Time	$V_{DD}=20V, V_{GS}=10V, RG=3\ \Omega, I_D=30A$	---	8	---	ns
t_r	Rise Time		---	16	---	ns
$t_{d(off)}$	Turn-Off Delay Time		---	21	---	ns
t_f	Fall Time		---	10	---	ns

Drain-Source Diode Characteristics and Maximum Ratings						
I_S	Continuous Source Current	$V_G=V_D=0V,$ Force Current	---	---	75	A
I_{SM}	Pulsed Source Current		---	---	280	A
V_{SD}	Diode Forward Voltage	$V_{GS}=0V, I_S=30A,$	---	---	1.2	V

T_{rr}	Reverse Recovery Time	IF=20A , dI/dt=100A/μs , T _J =25°C	---	20	---	ns
Q_{rr}	Reverse Recovery Charge		---	10	---	nC
Q_g	Total Gate Charge	V _{DS} =20V , I _D =30A V _{GS} =10V	---	46	---	nC
Q_{gs}	Gate-Source Charge		---	7.2	---	nC
Q_{gd}	Gate-Drain(“Miller”) Charge		---	8.8	---	nC

Notes:1. Repetitive Rating: Pulse Width Limited by Maximum Junction Temperature

2. EAS condition: T_J=25°C, V_{DD}=20V, R_G=25 Ω , L=0.5mH, I_{AS}=19.6A

3. Pulse Test: Pulse Width≤300μs, Duty Cycle≤0.5%

Typical Characteristics: (T_A=25°C unless otherwise noted)

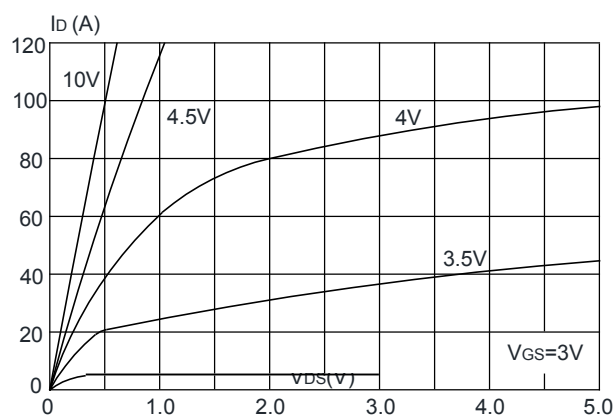


Figure1: Output Characteristics

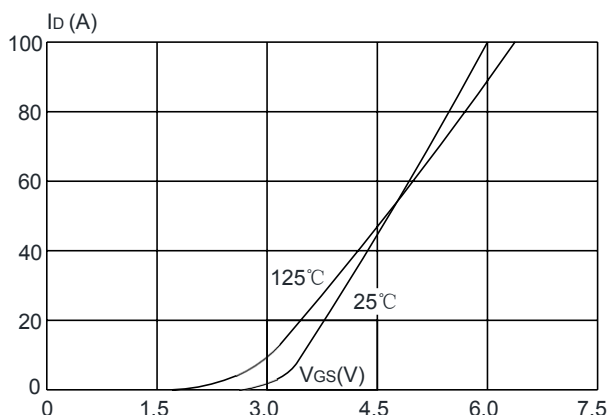


Figure 2: Typical Transfer Characteristics

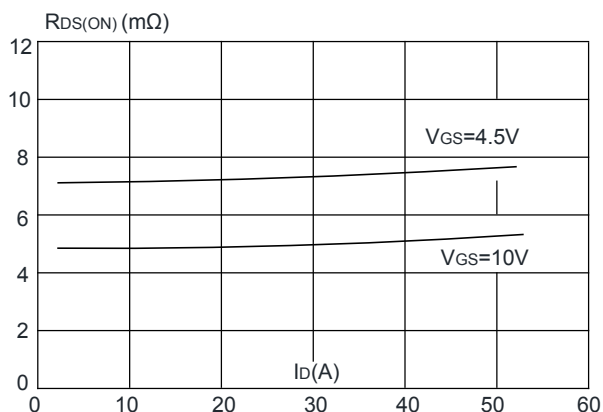


Figure 3: On-resistance vs. Drain Current
V_{GS}(V)

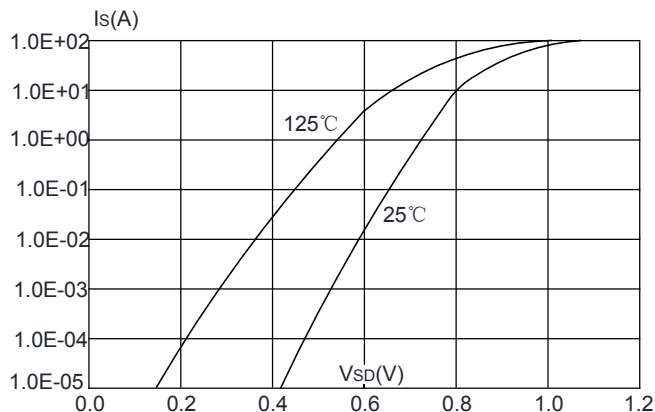


Figure 4: Body Diode Characteristics
C(pF)

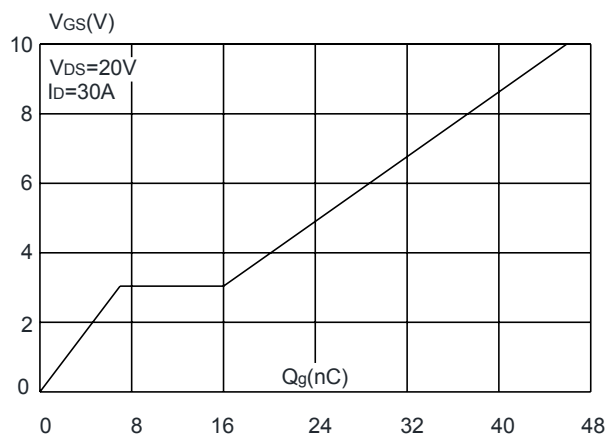


Figure 5: Gate Charge Characteristics

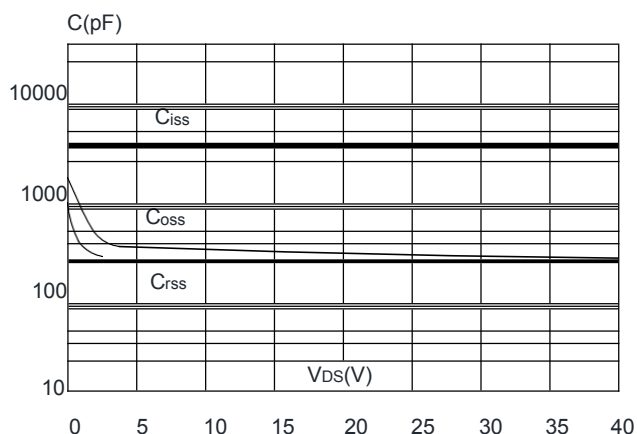


Figure 6: Capacitance Characteristics

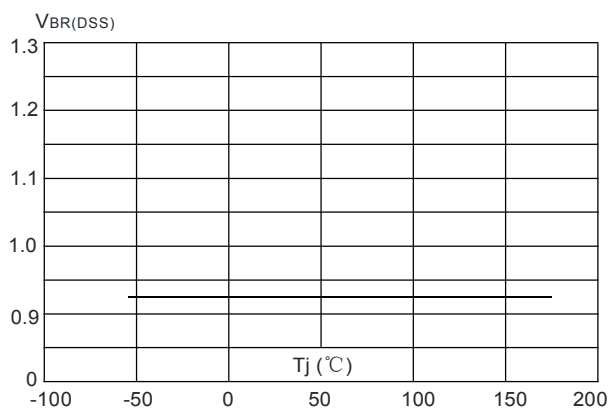


Figure 7: Normalized Breakdown Voltage vs. Junction Temperature

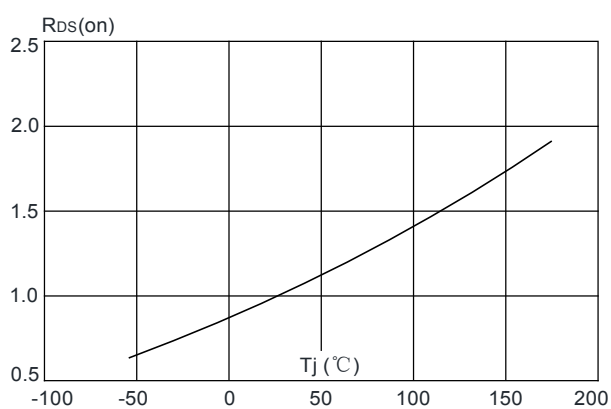


Figure 8: Normalized on Resistance vs. Junction Temperature

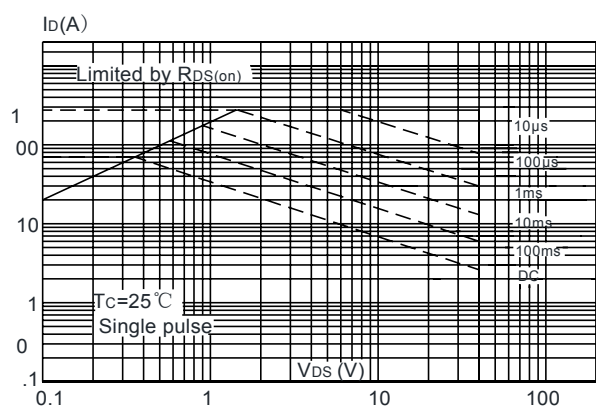


Figure 9: Maximum Safe Operating Area

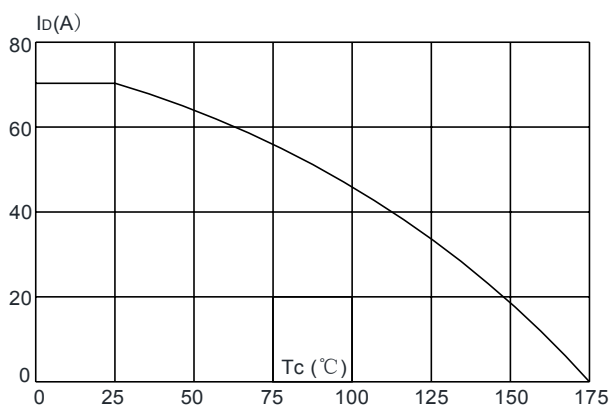


Figure 10: Maximum Continuous Drain Current vs. Case Temperature

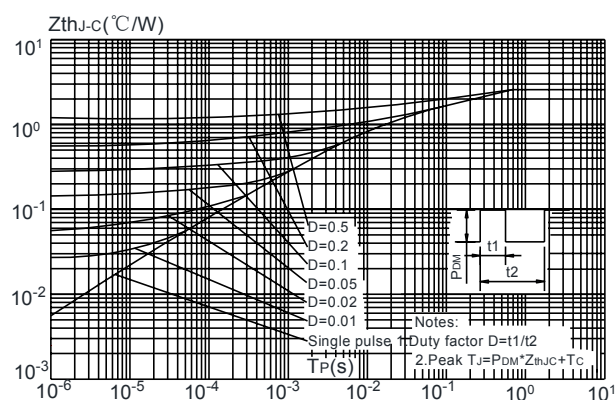


Figure.11:Maximum Effective
Transient Thermal Impedance, Junction-to-Case