40V Dual N-Channel Power MOSFET

DESCRIPTION：

·Ultra-Low $R_{DS(ON)}$

·Low Gate Charge

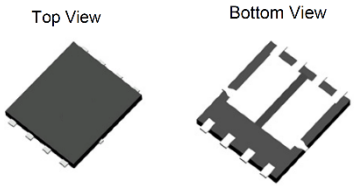
·100% UIS Tested, 100% Rg Tested

·Pb-Free Lead Plating

·RoHS compliant

·Halogen-free

V_{DS}	40V
I_D @V_{GS}=10V	43A
$R_{DS(ON)}$@V_{GS}=10V	5.7mΩ



PDFN5x6-8L-D

TYPICAL APPLICATIONS：

·Power Management in Computing, CE, IE 4.0, Communications

·Current Switch in DC/DC & AC/DC (SR) Sub-system

·Load Switching, Quick/Wireless Charging, Motor Driving

MAXIMUM RATINGS (at T_A = 25 °C, unless otherwise specified)

Characteristic	Condition	Symbol	Value	Unit
Drain-Source Voltage		V_{DS}	40	V
Gate-Source Voltage		V_{GS}	±20	V
Continuous Drain Current	Tc=25℃ Tc=100℃	I_D	43 27	A
Pulsed Drain Current (1)		I_{DM}	158	A
Avalanche Current (2)		I_{AS}	21	A
Avalanche Energy (2)		E_{AS}	22	mJ
Power dissipation	Tc=25℃ Tc=100℃	P_D	20 8.1	W
Junction & Storage temperature Range		T_J, T_{STG}	-55~+150	℃

Notes： 1. This single-pulse measurement was taken under T_{J_MAX} = 150°c.

2. This single-pulse measurement was taken under the following condition [L = 100uH, V_{GS}= 10V, V_{DD} = 20V] while its value is limited by T_{J_MAX}= 150℃

ELECTRICAL CHARATERISTICS (at T_J = 25 °C, unless otherwise specified)

Characteristic	Symbol	Min.	Typ.	Max.	Unit
Drain-Source Breakdown Voltage VGS = 0V, ID = 250uA	$V_{(BR)DSS}$	40			V
Zero Gate Voltage Drain Current VDS = 32 V, VGS = 0 V, T_J = 25 °C VDS = 32 V, VGS = 0 V, T_J = 55 °C	I_{DSS}			1 5	uA
Gate-Source Leakage Current VGS = ±20V, VDS = 0V	I_{GSS}			±100	nA
Gate-Source threshold voltage VDS = VGS, ID = 250uA	$V_{GS(th)}$	1.2	1.7	2.5	V
Drain-Source On-State Resistance VGS = 10V, ID = 20A VGS = 4.5V, ID = 15A	$R_{DS(on)}$		5.7 7.2	6.9 9.5	mΩ
Forward Transconductance VDS = 5V, ID = 20A	G_{FS}		95		S
Input capacitance f=1MHz, VDS=20 V, VGS=0 V	C_{iss}		1227		pF
Output capacitance f=1MHz, VDS=20 V, VGS=0 V	C_{oss}		526		pF
Reverse transfer capacitance f=1MHz, VDS=20 V, VGS=0 V	C_{rss}		55		pF
Gate Resistance VDS=0 V, VGS= 0V, f=1MHz	R_g		2.7		Ω
Total Gate Charge VDS= 20V, ID= 20A, VGS= 10V VDS= 20V, ID= 20A, VGS= 4.5V	Q_G		19.4 9.7		nC
Gate to Source Charge VDS= 20V, ID= 20A, VGS= 0 to 10V	Q_{GS}		3.1		nC
Gate to Drain Charge VDS= 20V, ID= 20A,VGS= 0 to 10V	Q_{GD}		3.5		nC
Turn-on delay time VDS=20 V, VGS= 10V, R_L=1.0Ω, R_{GEN}=6Ω	td (ON)		5.0		ns
Rise time VDS=20 V, VGS= 10V, R_L=1.0Ω, R_{GEN}=6Ω	tr		7.0		ns
Turn-off delay time VDS=20 V, VGS= 10V, R_L=1.0Ω, R_{GEN}=6Ω	td (OFF)		23		ns
Fall time VDS=20 V, VGS= 10V, R_L=1.0Ω, R_{GEN}=6Ω	tf		14.8		ns

Body Diode

ELECTRICAL CHARATERISTICS (at T_J = 25 °C, unless otherwise specified)

Characteristic	Symbol	Min.	Typ.	Max.	Unit
Diode Forward Voltage VGS = 0V, I_S = 1A	V_{SD}		0.71	1.0	V
Diode Continuous Current, Tc=25℃	I_S			20	A
Revers Recovery Time IF=15A, dI_F/dt = 100A/us	Trr		26		ns
Revers Recovery Charge IF=15A, dI_F/dt = 100A/us	Qrr		14.0		nC

THERMAL CHARACTERISTICS

Characteristic	Condition	Symbol	Value	Unit
Thermal resistance,	Junction to Ambient Junction to Case	$R_{\theta JA}$ $R_{\theta JC}$	60 6.2	℃/W

Typical Performance Characteristics

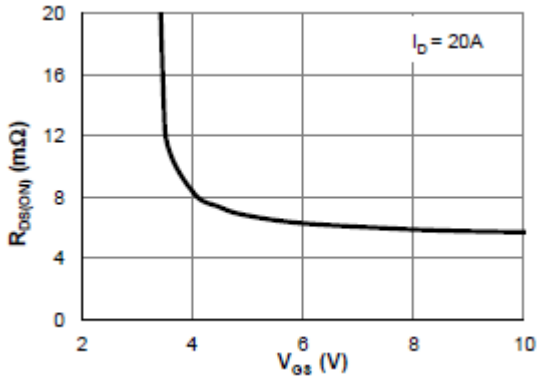


Figure 1. $R_{DS(ON)}$ VS. V_{GS}

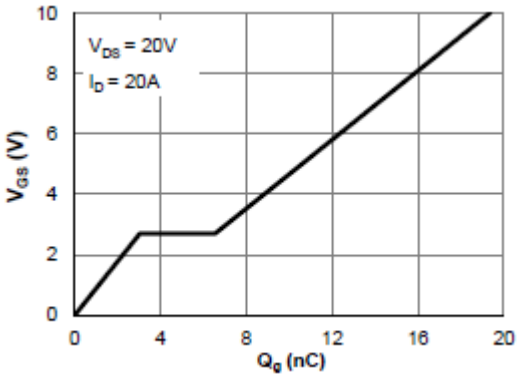


Figure 2. Gate Charge

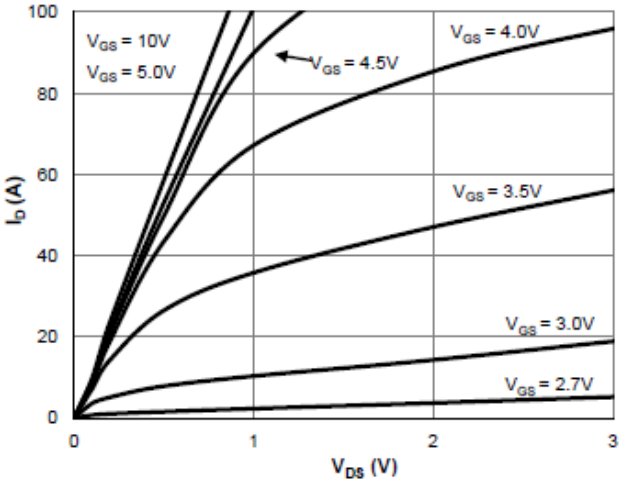


Figure 3. Saturation Characteristics

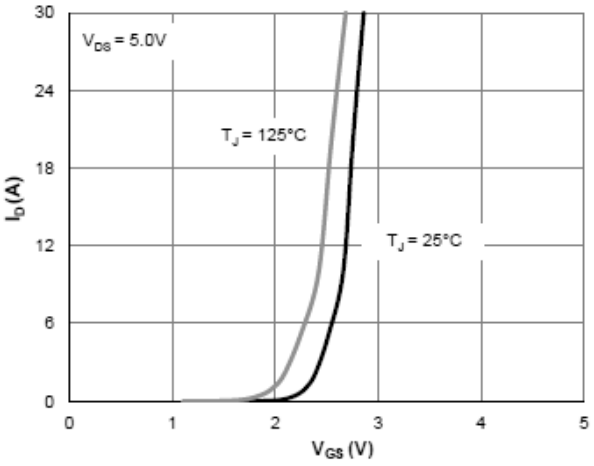


Figure 4. Transfer Characteristics

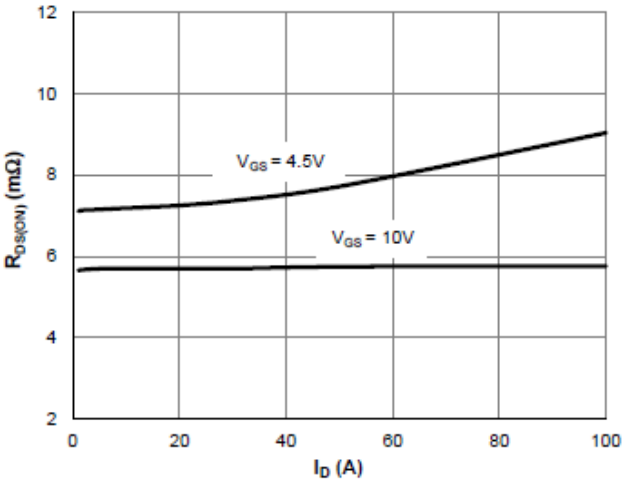


Figure 5. $R_{DS(ON)}$ vs. Drain Current

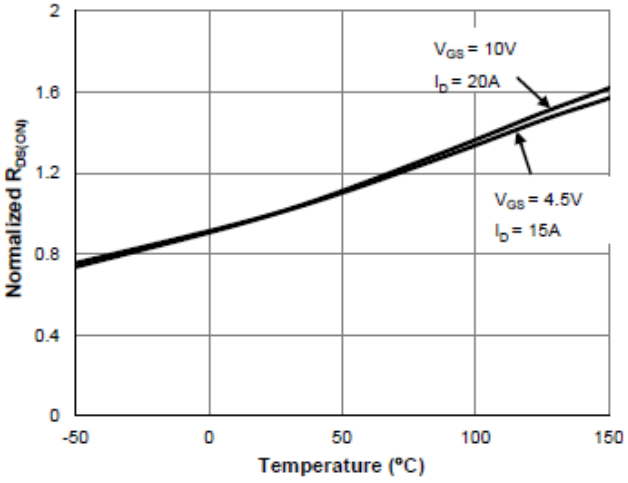


Figure 6. $R_{DS(ON)}$ vs. Junction Temperature

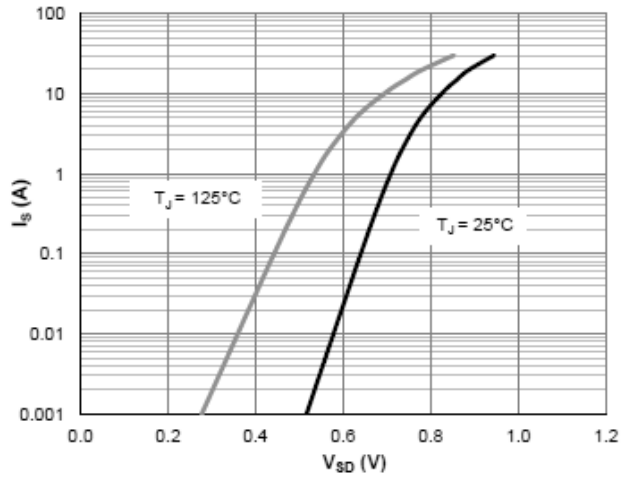


Figure 7. Body Diode Characteristics

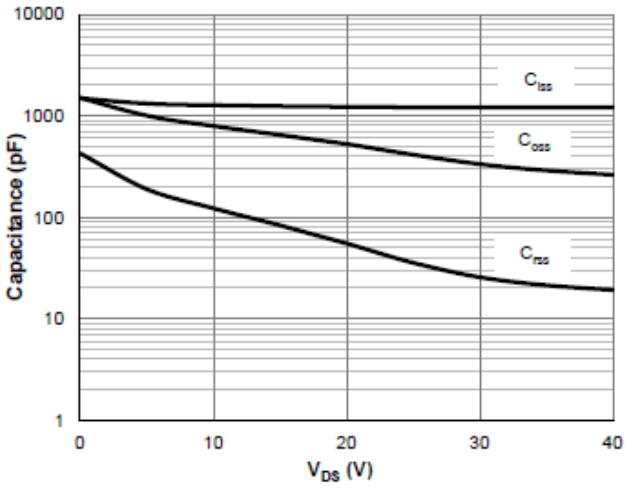


Figure 8 Capacitance Characteristics

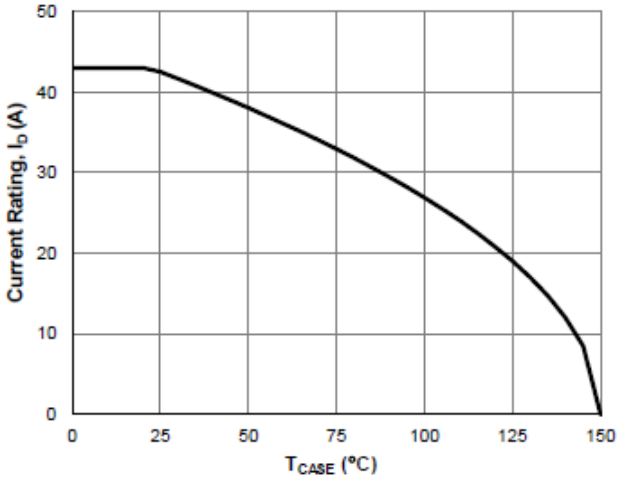


Figure 9. Current De-rating

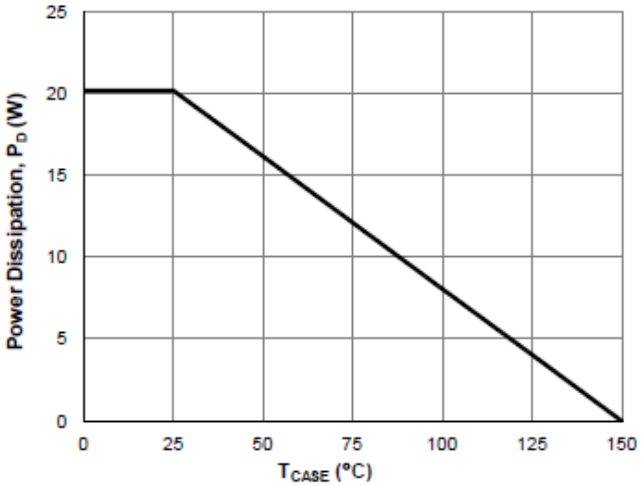


Figure 10. Power De-rating

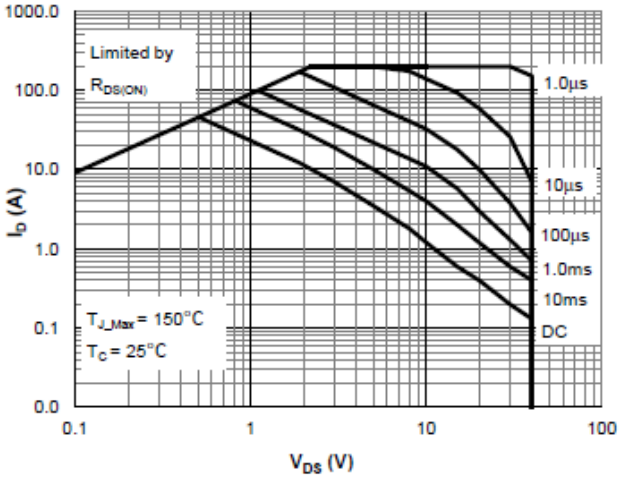


Figure 11. Maximum Safe Operating Area

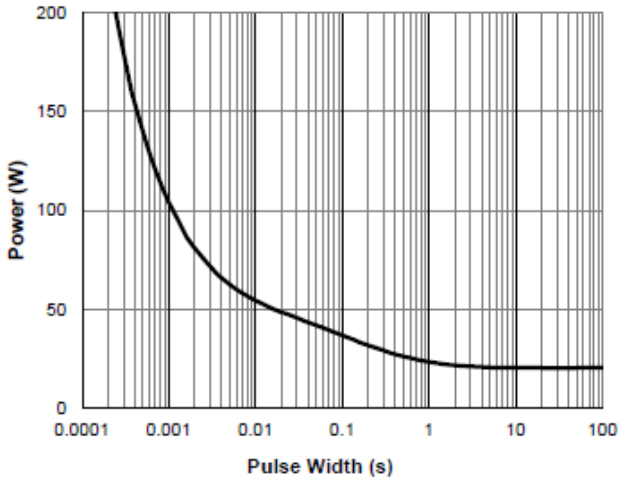


Figure 12. Single Pulse Power Rating, Junction to Case

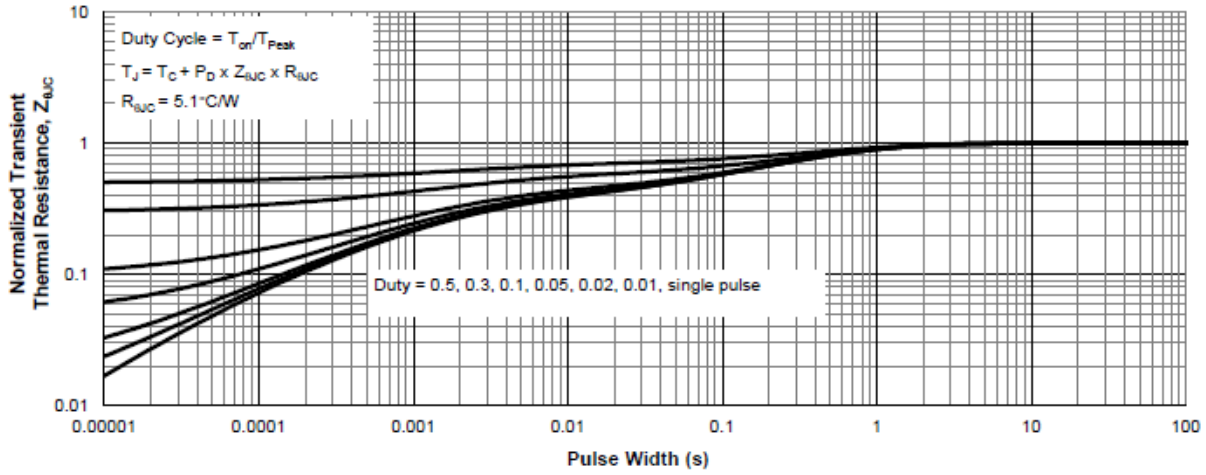
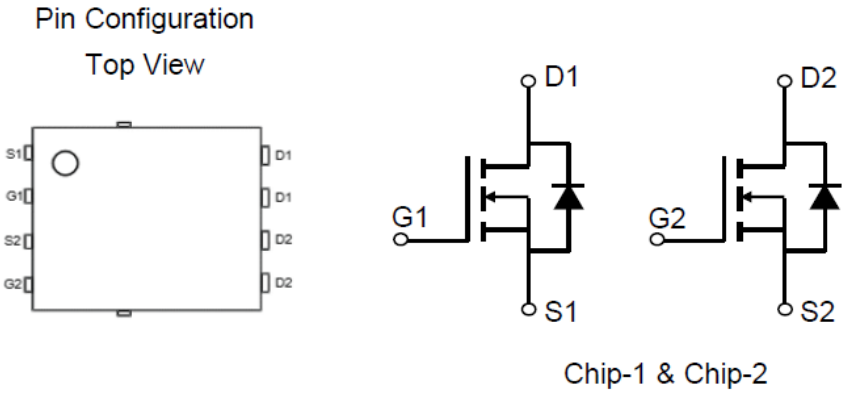
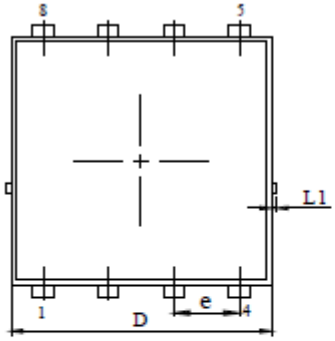


Figure 15. Normalized Maximum Transient Thermal Impedance

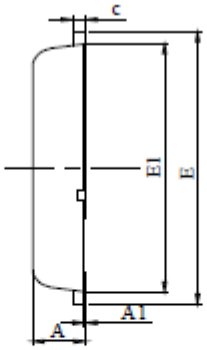
·Circuit diagram



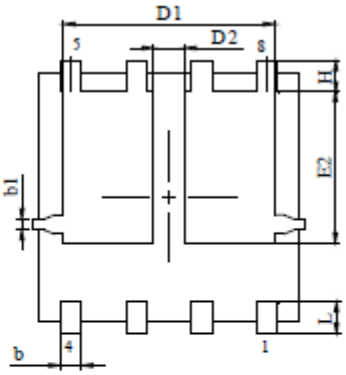
·Package outlines :



Top View



Side View



Bottom View

Front View

NOTES:
1. DIMENSIONING AND TOLERANCING PER ASME Y14.5M,1994.
2. ALL DIMNESIONS IN MILLIMETER (ANNGLE IN DEGREE).
3. DIMENSIONS D1 AND E1 DO NOT INCLUDE MOLD FLASH PROTRUSIONS OR GATE BURRS.

DIM.	MILLIMETER		
	MIN.	NOM.	MAX.
A	0.90	1.00	1.10
A1	0.00	-	0.10
b	0.31	0.41	0.51
b1	0.15	0.25	0.35
c	0.23	-	0.33
D	4.95	5.05	5.15
D1	4.00	4.10	4.20
D2	0.50	0.60	0.70
E	6.05	6.15	6.25
E1	5.50	5.60	5.70
E2	3.31	3.41	3.51
e	1.27BSC		
H	0.60	0.70	0.80
L	0.50	0.70	0.80
L1	-	-	0.125
a	-	-	12°

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