40V N-channel Power MOSFET

V_{DSS}	40V
I_D	326A
$R_{DS(ON)_Typ.}$ @V_{GS}=10V	0.66mΩ

DESCRIPTION：

·Low On-Resistance

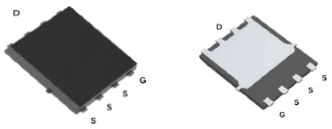
·Excellent FoM (figure of merit)

·100% ΔVDS & UIS & Rg tested

·Green molding compound

·Moisture sensitivity: level 1 per J-STD-020

·UL flammability classification rating 94V-0



PDFN5×6-8L

TYPICAL APPLICATIONS：

·Load Switch

·Motor drives

·High frequency switching, synchronous rectification

MAXIMUM RATINGS (at T_C = 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	326 206	A
Pulsed Drain Current (1)		I_{DM}	1306	A
Single Pulsed Avalanche Energy (2)		E_{AS}	1000	mJ
Single Pulse Avalanche Current	L= 0.3mH	I_{AS}	56	A
Power dissipation	Tc=25℃ Tc=100℃	P_D	132 53	W
Junction & Storage temperature Range		T_J, T_{STG}	-55~+150	℃

Notes： 1. This current is calculated on single pulse with 10μs Single Pulse.

2. E_{AS} condition: Starting T_J=25C, V_{DD}=20V, V_{GS}=10V, R_G=25ohm, L=1.0mH.

THERMAL CHARACTERISTICS

Characteristic	Condition	Symbol	Value	Unit
Thermal resistance,	Junction to Ambient Junction to Case	$R_{\theta JA}$ $R_{\theta JC}$	40 0.95	℃/W

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 = 40V, VGS = 0 V, T_J=25℃ VDS = 40V, VGS = 0 V, T_J=125℃	I_{DSS}			1.0 100	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	$R_{DS(on)}$		0.66 0.93	0.80 1.2	mΩ
Forward Transconductance VDS = 5.0V, ID = 20A	gfs		87		S
Diode Forward Voltage VGS = 0V, I_S =2.0A	V_{SD}		0.7	1.2	V
Gate Resistance f=1MHz	R_g		2.2		Ω
Input capacitance f=1MHz, VDS=20V, VGS=0 V	C_{iss}		5625		pF
Output capacitance f=1MHz, VDS=20V, VGS=0 V	C_{oss}		3333		pF
Reverse transfer capacitance f=1MHz, VDS=20V, VGS=0 V	C_{rss}		114		pF
Turn-on delay time VDD=20 V, VGS= 10V, ID=20A, R_{GEN}=3Ω	td (ON)		4.6		ns
Rise time VDD=20 V, VGS= 10V, ID=20A, R_{GEN}=3Ω	tr		10		ns
Turn-off delay time VDD=20 V, VGS= 10V, ID=20A, R_{GEN}=3Ω	td (OFF)		74		ns
Fall time VDD=20 V, VGS= 10V, ID=20A, R_{GEN}=3Ω	tf		35		ns
Total Gate Charge VDS= 20V, ID= 20A, VGS= 10V VDS= 20V, ID= 20A,VGS= 4.5V	Q_G		81 40		nC
Gate to Source Charge VDS= 20V, ID= 20A,VGS= 10V	Q_{GS}		14.7		nC
Gate to Drain Charge VDS= 20V, ID= 20A,VGS= 10V	Q_{GD}		12.8		nC
Gate Plateau Voltage VDS= 20V, ID= 20A,VGS= 10V	Vplateau		2.9		V
Maximum Continuous Body Diode Forward Current	IS			326	A
Revers Recovery Time IF=20A, di/dt = 100A/us	Trr		67		ns
Revers Recovery Charge IF=20A, di/dt = 100A/us	Qrr		111		nC

Typical Performance Characteristics

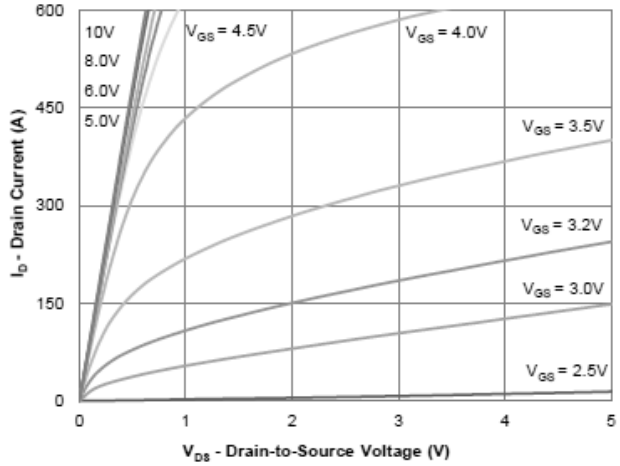


Figure 1. Output Characteristics

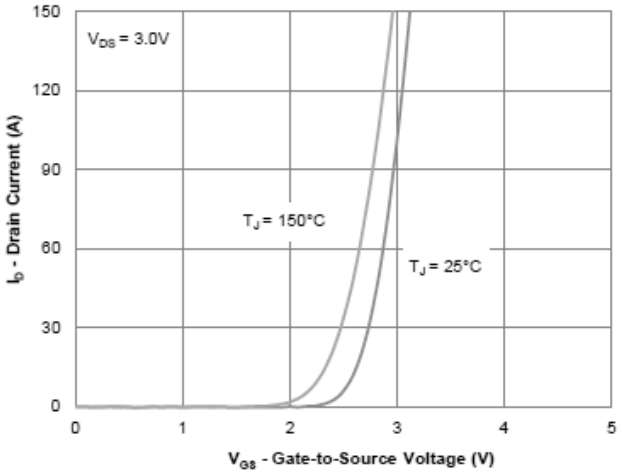


Figure 2. Transfer Characteristics

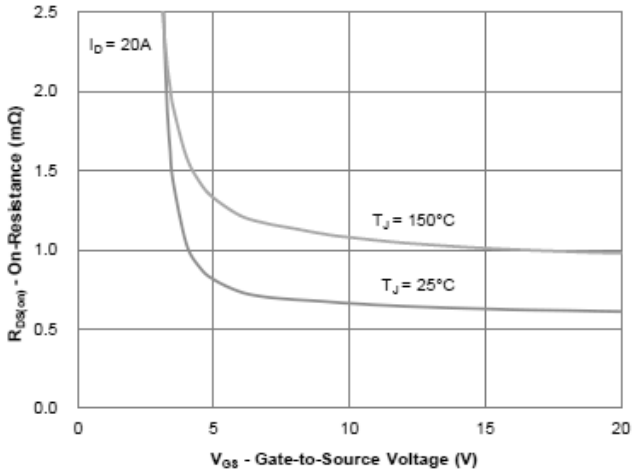


Figure 3. On-Resistance vs. Gate-Source Voltage

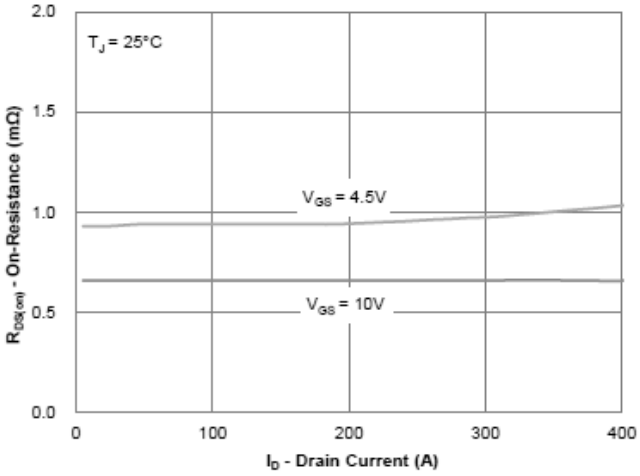


Figure4. On-Resistance vs. Drain Current and Gate Voltage

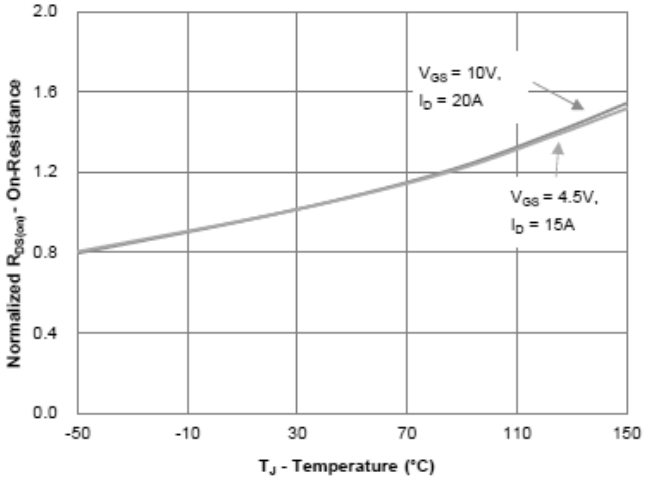


Figure 5. On-Resistance vs. Junction Temperature

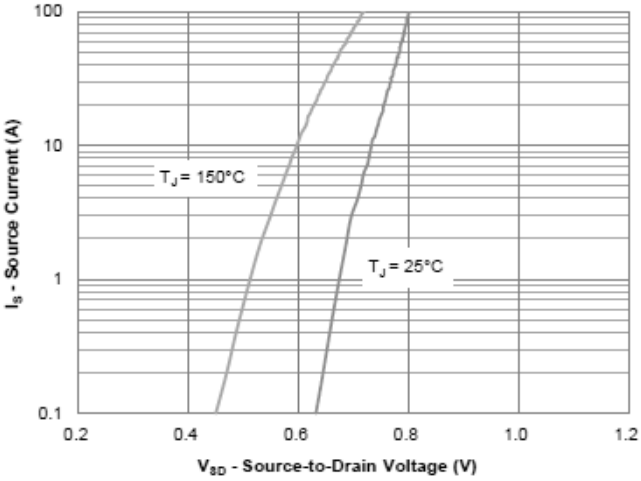


Figure 6. Source-Drain Diode Forward Voltage

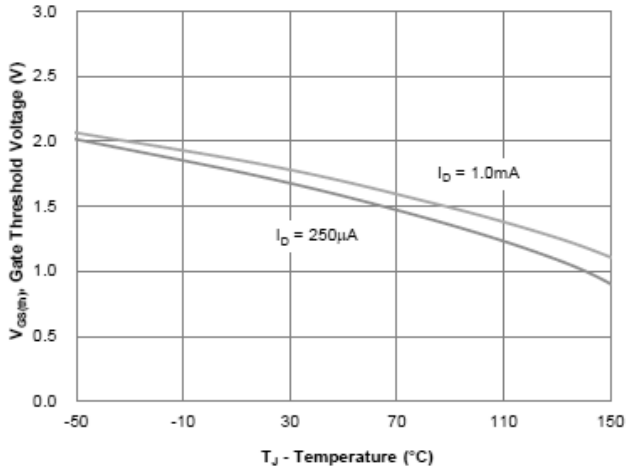


Figure 7. Gate Threshold Variation vs. Junction Temperature

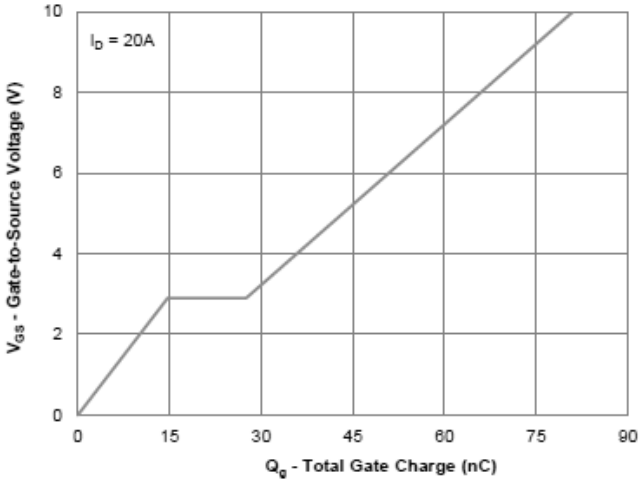


Figure8. Gate Charge Characteristics

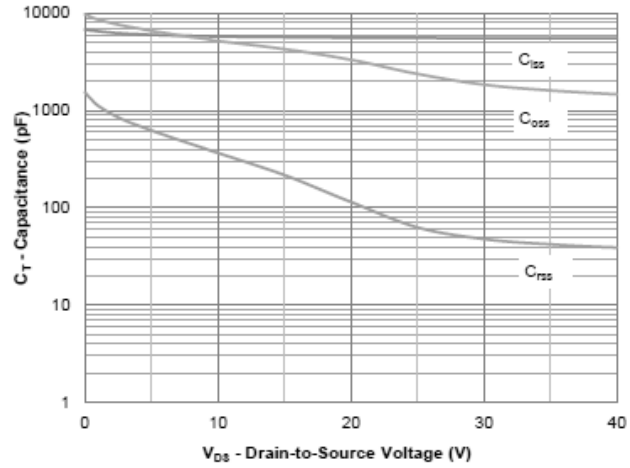


Figure 9. Capacitance Characteristics

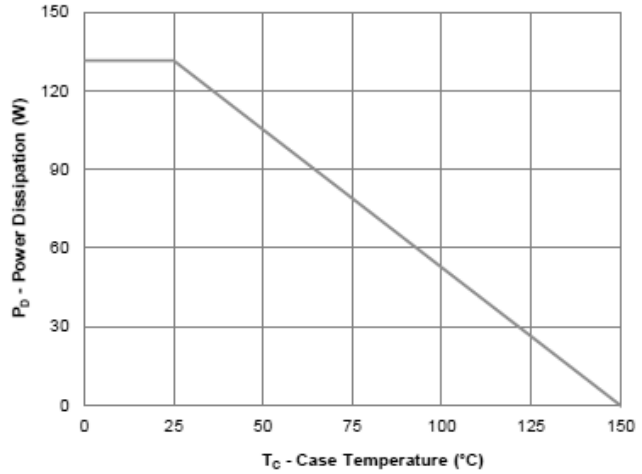


Figure 10. Power Derating

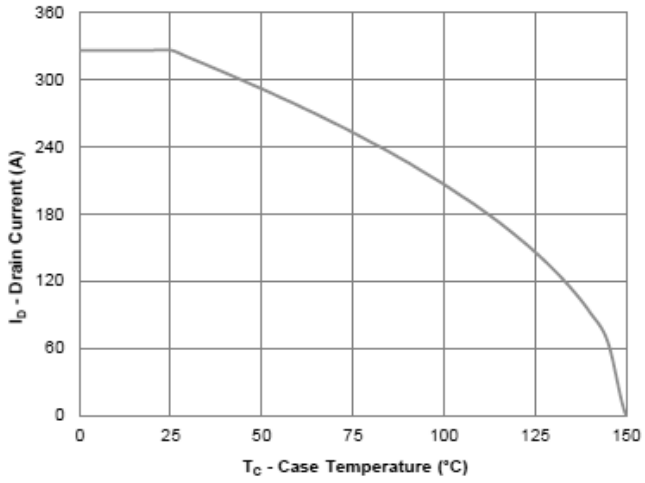


Figure 11. Current Derating

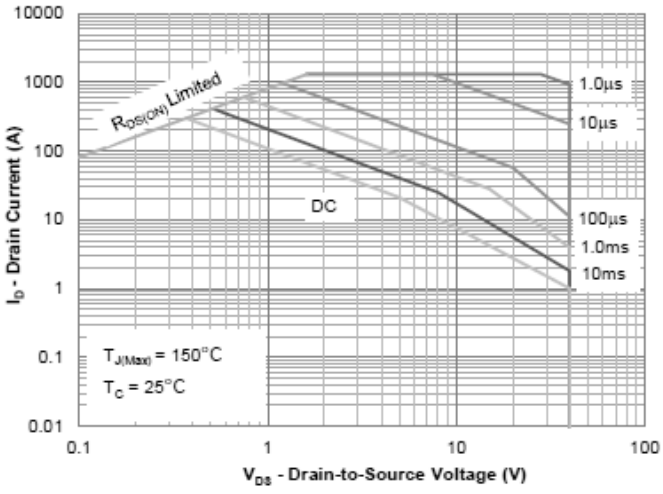


Figure 12. Safe Operating Area

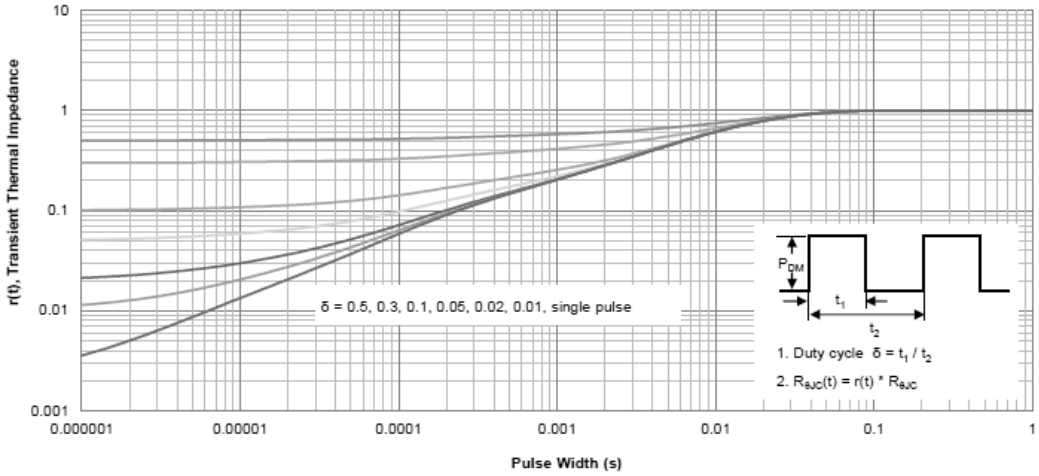
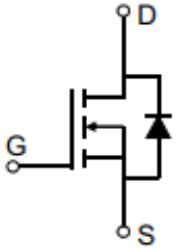
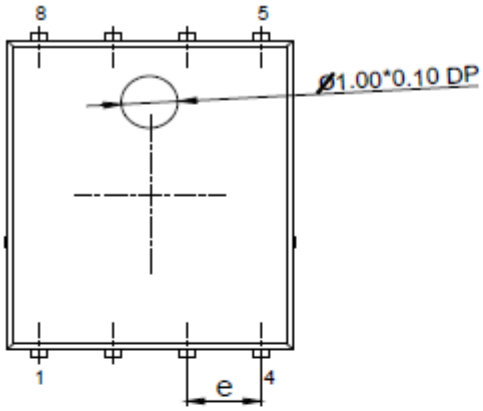


Figure 13. Normalized Maximum Transient Thermal Impedance

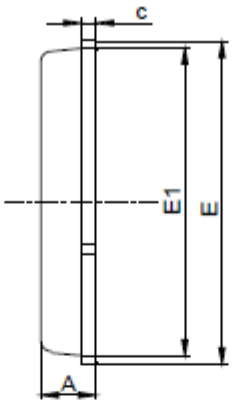
·Circuit diagram



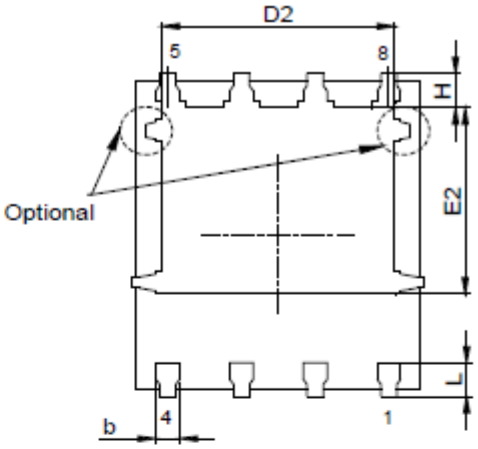
·Package outlines : Dimensions in (mm)



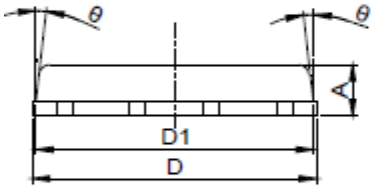
Top View



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
b	0.20	--	0.51
c	0.21	0.25	0.34
D	4.90	--	5.40
D1	4.80	--	5.15
D2	3.70	--	4.20
E	5.90	--	6.50
E1	5.65	5.80	5.95
E2	3.32	3.50	3.63
e	1.27BSC		
H	0.50	--	0.93
L	0.45	--	0.91
θ	0°	--	12°

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