40V N-Channel Power MOSFET

DESCRIPTION：

·Ultra-low ON-resistance, $R_{DS(ON)}$

·Low Gate Charge, Qg

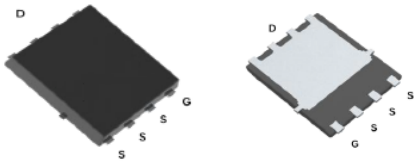
·100% UIS and Rg Tested

·Pb-free Lead Plating

·Halogen-free and RoHS-compliant

·AEC-Q101 Qualified for Automotive Applications

V_{DS}	40V
I_D @V_{GS}=10V	90A
$R_{DS(ON)_Typ.}$ @V_{GS}=10V	4.2mΩ



PDFN5×6-8L

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	90 64	A
Pulsed Drain Current		I_{DM}	360	A
Avalanche Current		I_{AS}	27	A
Avalanche Energy		E_{AS}	36	mJ
Power dissipation	Tc=25℃ Tc=100℃	P_D	75 38	W
Junction & Storage temperature Range		T_J, T_{STG}	-55~+175	℃

THERMAL CHARACTERISTICS

Characteristic	Condition	Symbol	Value	Unit
Thermal resistance,	Junction to Ambient Junction-to-Case	$R_{\theta JA}$ $R_{\theta JC}$	67 2.3	℃/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 = 32 V, VGS = 0 V, T_J = 25 °C VDS = 32 V, VGS = 0 V, T_J = 55 °C	I_{DSS}			1.0 5.0	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	1.6	2.5	V
Drain-Source On-State Resistance VGS = 10V, ID = 20A VGS = 4.5V, ID = 15A	$R_{DS(on)}$		4.2 5.8	5.2 7.6	mΩ
Forward Transconductance VDS = 32 V, ID = 20A	g_{FS}		80		S
Diode Forward Voltage IS = 1A ,VGS = 0V	V_{SD}		0.69	1.0	V
Diode Continuous Current	I_S			90	A
Input capacitance f=1MHz, VDS=20 V, VGS=0 V	C_{iss}		1204		pF
Output capacitance f=1MHz, VDS=20 V, VGS=0 V	C_{oss}		536		pF
Reverse transfer capacitance f=1MHz, VDS=20 V, VGS=0 V	C_{rss}		51		pF
Gate Resistance VGS = 0V, VDS= 0V, f = 1MHz	R_G		1.8		Ω
Total Gate Charge VDS= 20V, ID= 20A, VGS= 10V VDS= 20V, ID= 20A, VGS= 4.5V	Q_G		17.9 9.7		nC
Gate to Source Charge VDS= 20V, ID= 20A, VGS= 0 to 10V	Q_{GS}		3.2		nC
Gate to Drain Charge VDS= 20V, ID= 20A, VGS= 0 to 10V	Q_{GD}		4.0		nC
Turn-on delay time VDS= 20V, VGS= 10V, R_L=1Ω, R_{GEN}=6Ω	td (ON)		4.8		ns
Rise time VDS= 20V, VGS= 10V, R_L=1Ω, R_{GEN}=6Ω	tr		8.6		ns
Turn-off delay time VDS= 20V, VGS= 10V, R_L=1Ω, R_{GEN}=6Ω	td (OFF)		23		ns
Fall time VDS= 20V, VGS= 10V, R_L=1Ω, R_{GEN}=6Ω	tf		15.2		ns
Revers Recovery Time IF=20A, di/dt = 100A/us	Trr		50		ns
Revers Recovery Charge IF=20A, di/dt = 100A/us	Qrr		42		nC

Typical Performance Characteristics

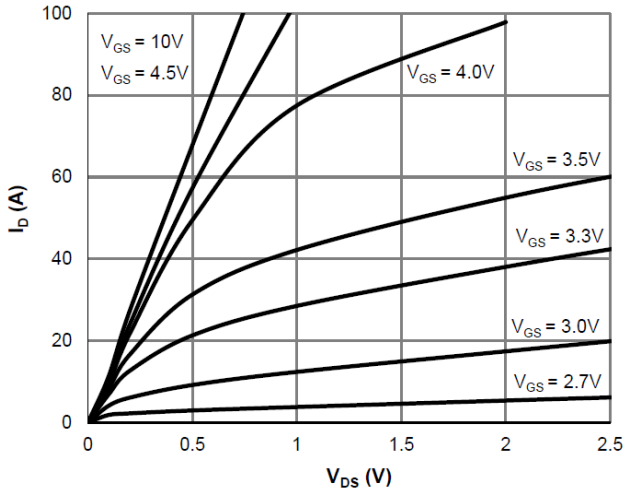


Figure 1. Saturation Characteristics

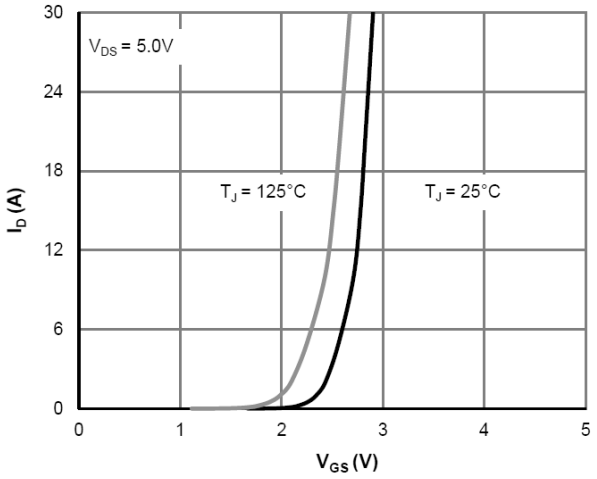


Figure 2. Transfer Characteristics

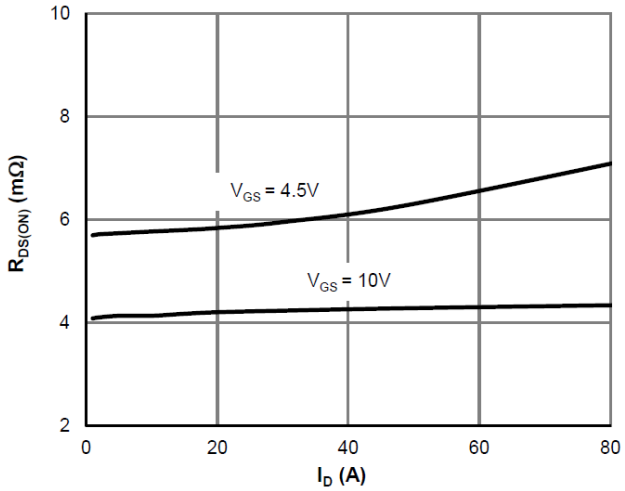


Figure 3. $R_{DS(ON)}$ vs. Drain Current

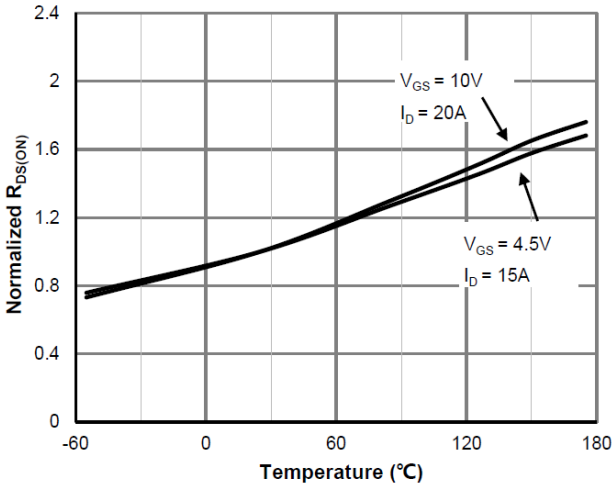


Figure 4. $R_{DS(ON)}$ VS. Junction Temperature

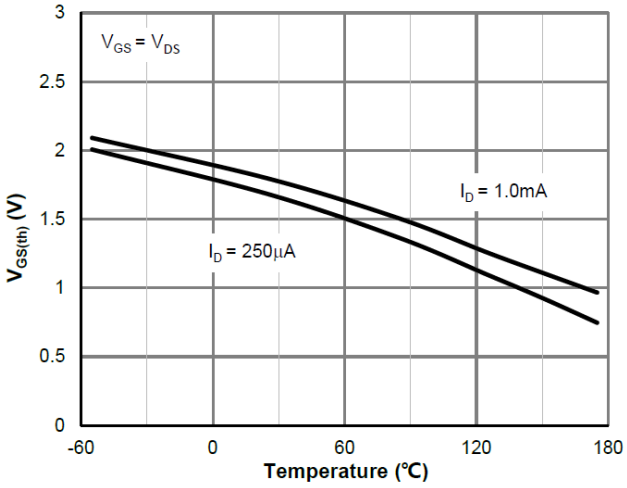


Figure 5. $V_{GS(th)}$ vs. Junction Temperature

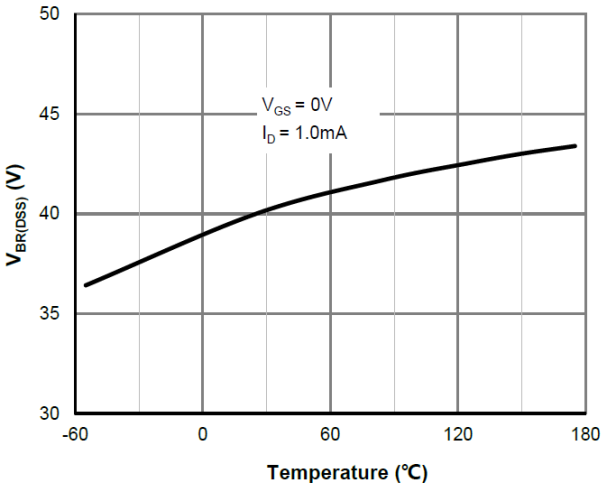


Figure 6. $R_{DS(ON)}$ vs. Junction Temperature

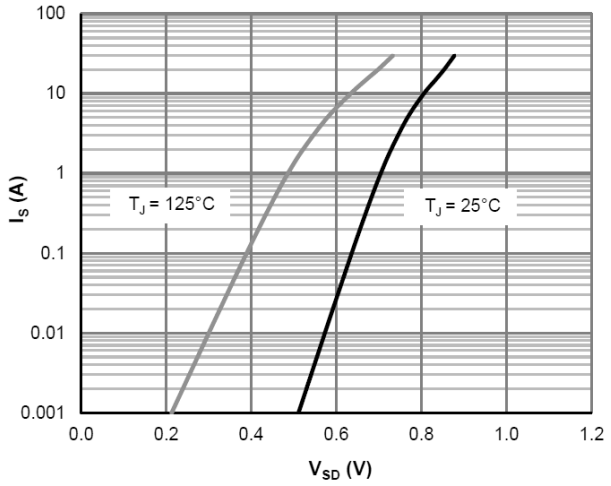


Figure 7. Body-Diode Characteristics

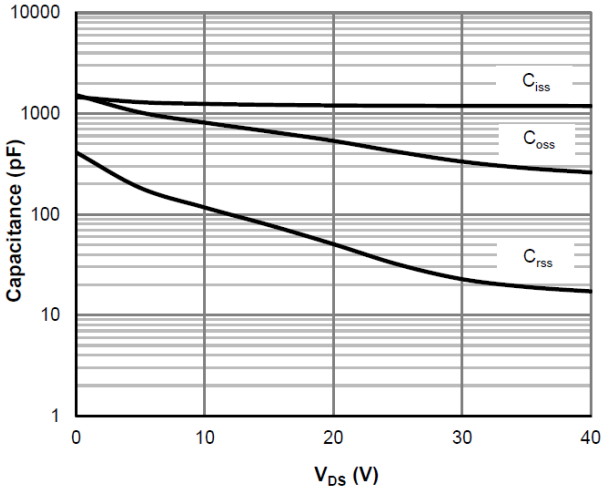


Figure 8. Capacitance Characteristics

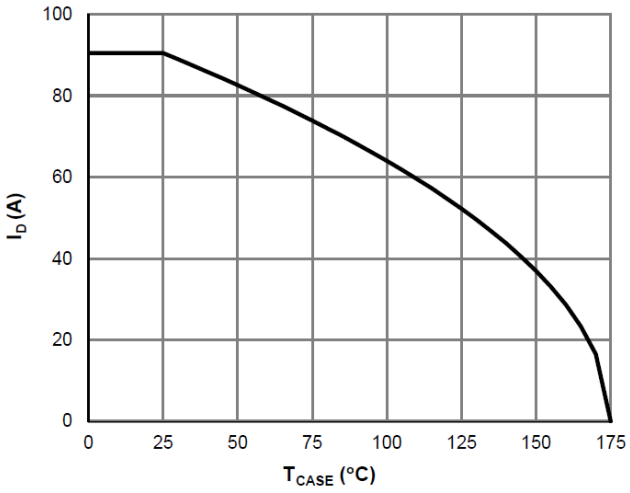


Figure 9. Current De-rating

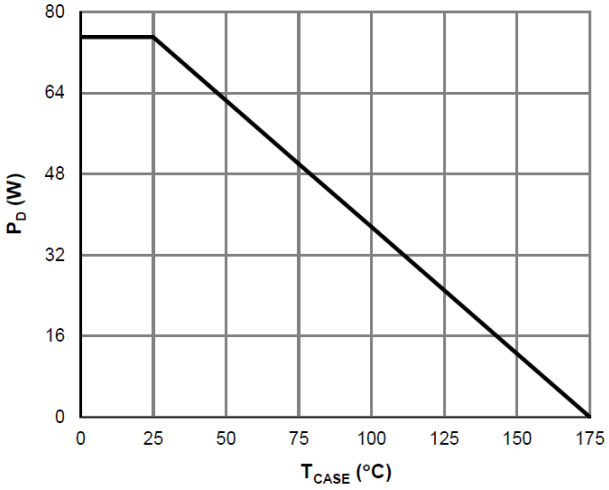


Figure10. Power De-rating

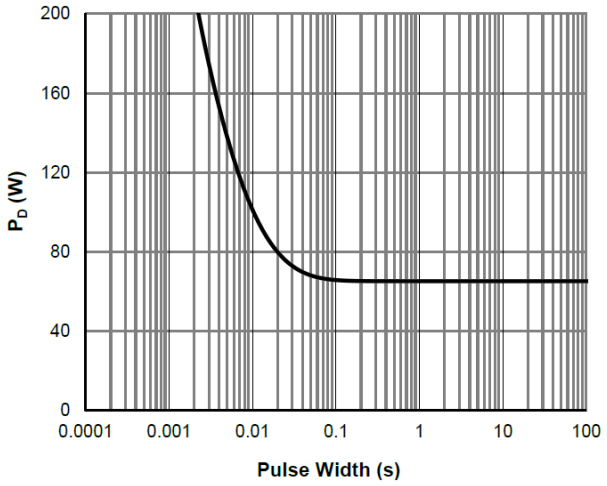


Figure 11. Single Pulse Power Rating, Junction-to-Case

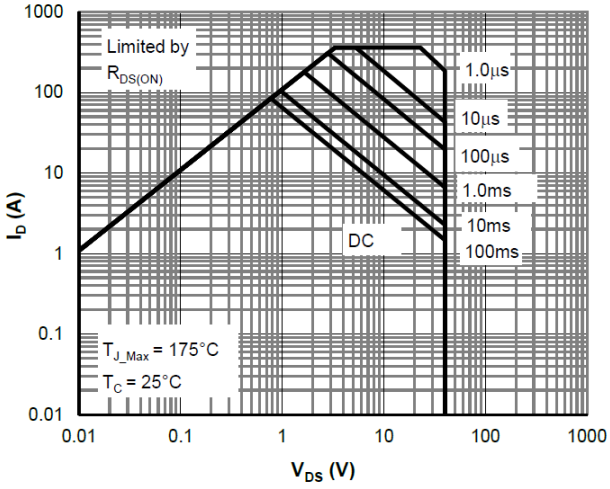


Figure 12. Maximum Safe Operating Area

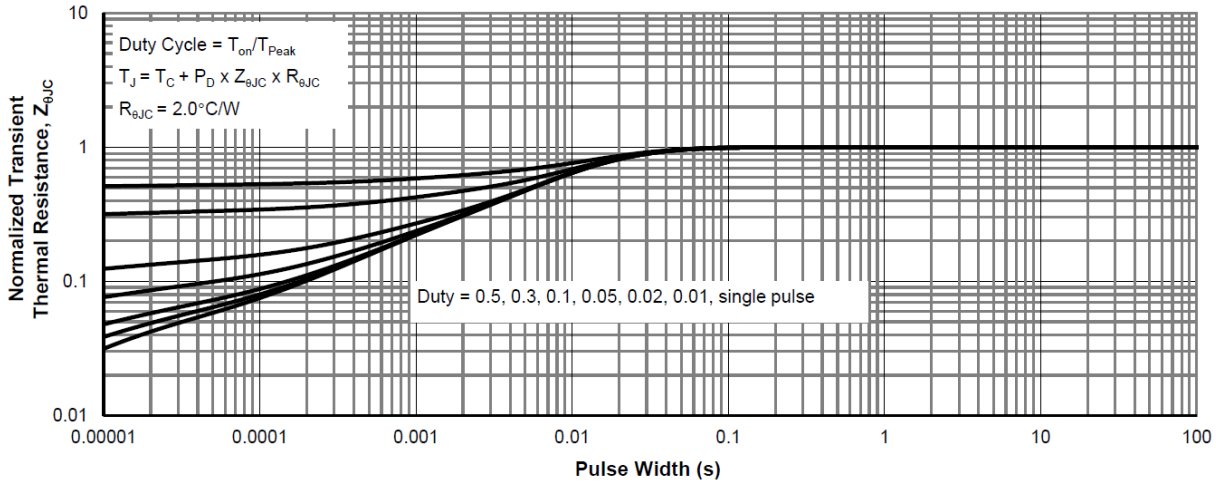
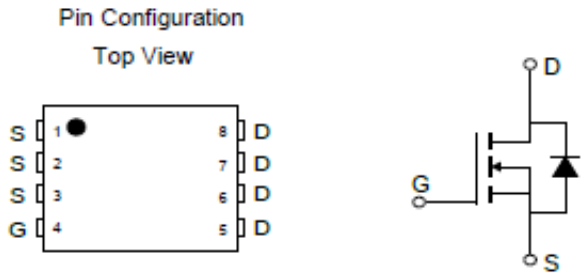
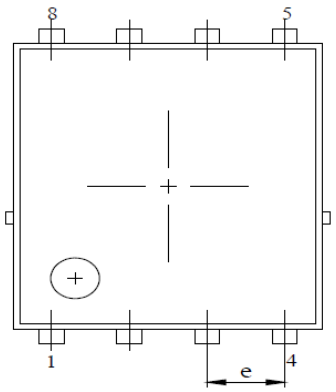


Figure13. Normalized Maximum Transient Thermal Impedance

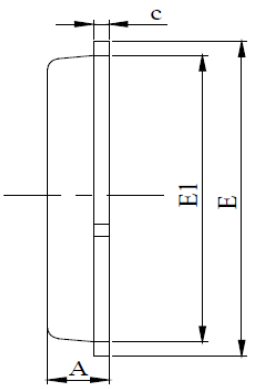
·Circuit diagram



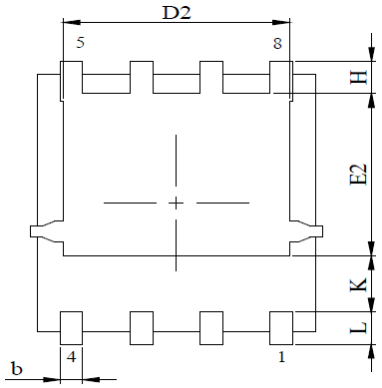
·Package outlines : Dimensions in (mm)



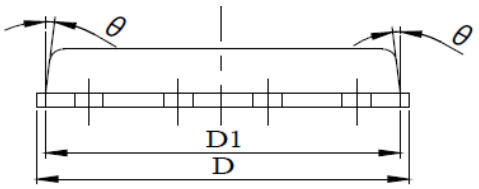
Top View



Side View



Bottom View



Front View

DIM.	MILLIMETER		
	MIN.	NOM.	MAX.
A	0.90	1.00	1.10
b	0.31	0.41	0.51
c	0.20	0.25	0.30
D	5.00	5.20	5.40
D1	4.95	5.05	5.15
D2	4.00	4.10	4.20
E	6.05	6.15	6.25
E1	5.50	5.60	5.70
E2	3.42	3.53	3.63
e		1.27BSC	
H	0.60	0.70	0.80
L	0.50	0.70	0.80
K		1.23 REF	
θ	-	-	10°

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