60V Dual N-Channel Power MOSFET

V_{DSS}	60V
I_D	56A
$R_{DS(ON)_Typ.}$ @V_{GS}=10V	4.7mΩ

DESCRIPTION：

·Ultra-Low $R_{DS(ON)}$

·Low Gate Charge

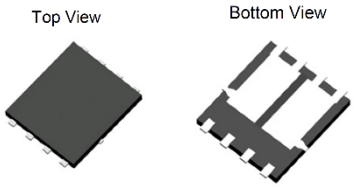
·100% UIS Tested, 100% Rg Tested

·Pb-Free Lead Plating

·RoHS compliant

·Halogen-free

·AEC-Q101 Qualified for Automotive Applications



PDFN5x6-8L-D

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

Characteristic	Condition	Symbol	Value	Unit
Drain-Source Voltage		V_{DS}	60	V
Gate-Source Voltage		V_{GS}	±20	V
Continuous Drain Current(1)	Tc=25℃ Tc=100℃	I_D	56 40	A
Pulsed Drain Current (2)		I_{DM}	224	A
Avalanche Energy (3)		E_{AS}	216	mJ
Power dissipation	Tc=25℃ Tc=100℃	P_D	38 18.7	W
Junction & Storage temperature Range		T_J, T_{STG}	-55~+175	℃

Notes：1. Computed continuous current assumes the condition of T_{J_Max} while the actual continuous current depends on the thermal & electro-mechanical application board design.
2. This single-pulse measurement was taken under T_{J_Max} = 175°C.
3. E_{AS} of 216 mJ is based on starting TJ = 25°C, L = 3.0mH, I_{AS} = 12A, V_{GS} = 10V, V_{DD} = 30V; 100% test at L = 0.3mH, I_{AS} = 25A. T_{J_Max} = 175°C.

THERMAL CHARACTERISTICS

Characteristic	Condition	Symbol	Value	Unit
Thermal resistance,	Junction to Ambient Junction to Case	$R_{\theta JA}$ $R_{\theta JC}$	78 6.2	℃/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	$V_{(BR)DSS}$	60			V
Zero Gate Voltage Drain Current VDS = 48 V, VGS = 0 V, T_J = 25 °C VDS = 48 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	$V_{GS(th)}$	2.2	2.8	3.4	V
Drain-Source On-State Resistance VGS = 10V, ID = 20A	$R_{DS(on)}$		4.7	5.8	mΩ
Forward Transconductance VDS = 5V, ID = 20A	G_{FS}		80		S
Input capacitance f=1MHz, VDS=30 V, VGS=0 V	C_{iss}		1492		pF
Output capacitance f=1MHz, VDS=30 V, VGS=0 V	C_{oss}		940		pF
Reverse transfer capacitance f=1MHz, VDS=30 V, VGS=0 V	C_{rss}		109		pF
Gate Resistance VDS=0 V, VGS= 0V, f=1MHz	R_g		2.2		Ω
Total Gate Charge VDS= 30V, ID= 20A, VGS= 10V VDS= 30V, ID= 20A, VGS= 6.0V	Q_G		34 21		nC
Gate to Source Charge VDS= 30V, ID= 20A, VGS= 0 to 10V	Q_{GS}		11.4		nC
Gate to Drain Charge VDS= 20V, ID= 20A,VGS= 0 to 10V	Q_{GD}		5.0		nC
Turn-on delay time VDS=20 V, VGS= 10V, R_L=1.0Ω, R_{GEN}=6Ω	$td_{(ON)}$		12.6		ns
Rise time VDS=20 V, VGS= 10V, R_L=1.0Ω, R_{GEN}=6Ω	tr		27		ns
Turn-off delay time VDS=20 V, VGS= 10V, R_L=1.0Ω, R_{GEN}=6Ω	$td_{(OFF)}$		28		ns
Fall time VDS=20 V, VGS= 10V, R_L=1.0Ω, R_{GEN}=6Ω	tf		8.0		ns
Revers Recovery Time IF=20A, dI_F/dt = 100A/us	Trr		35		ns
Revers Recovery Charge IF=20A, dI_F/dt = 100A/us	Qrr		25		nC

Typical Performance Characteristics

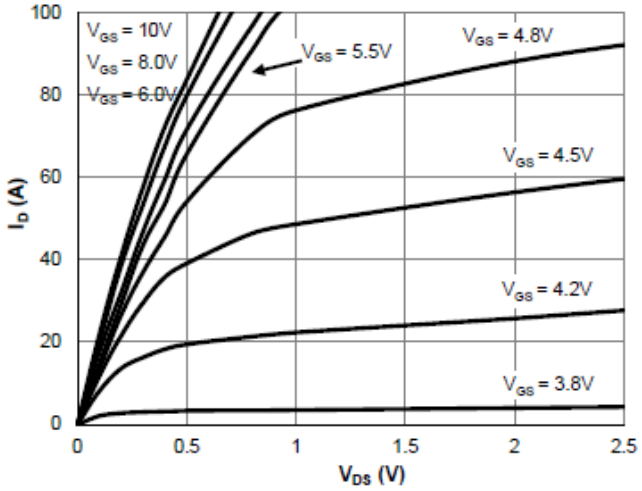


Figure 1. Saturation Characteristics

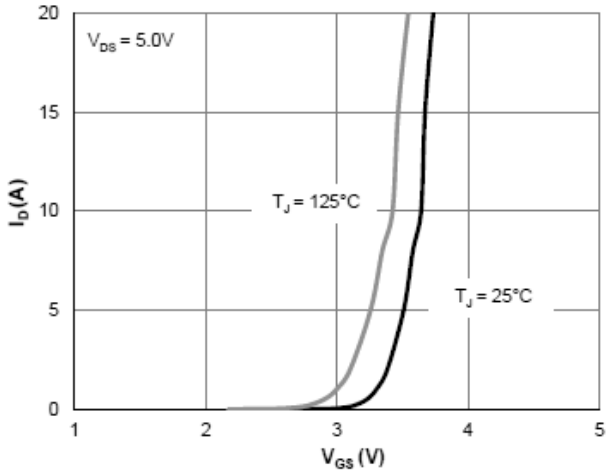


Figure 2. Transfer Characteristics

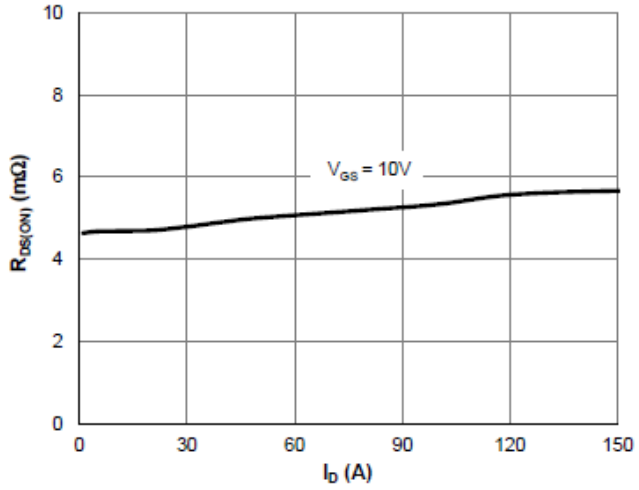


Figure 3. $R_{DS(ON)}$ vs. Drain Current

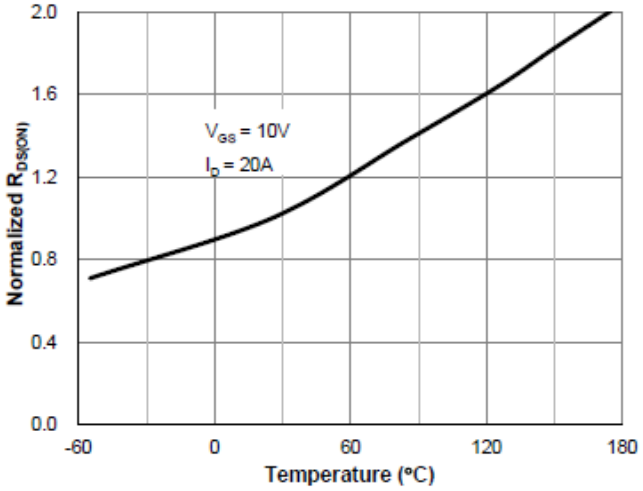


Figure 4. $R_{DS(ON)}$ vs. Junction Temperature

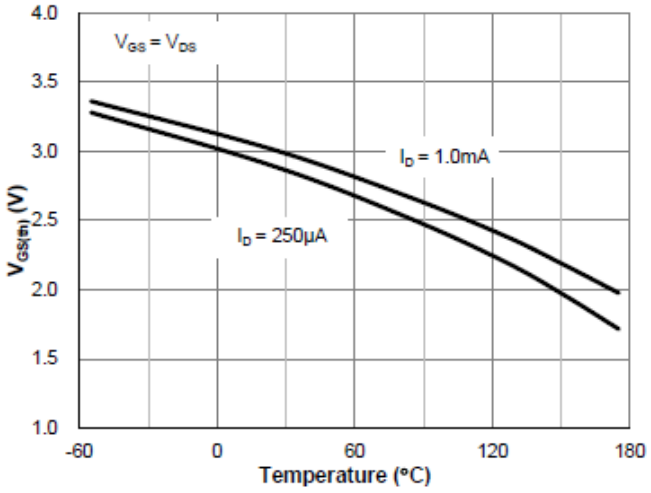


Figure 5. $V_{GS(th)}$ vs. Junction Temperature

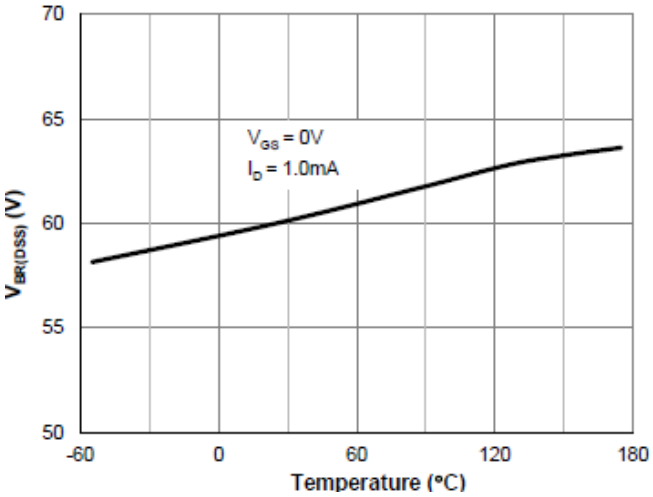


Figure 6. $V_{BR(DSS)}$ vs. Junction Temperature

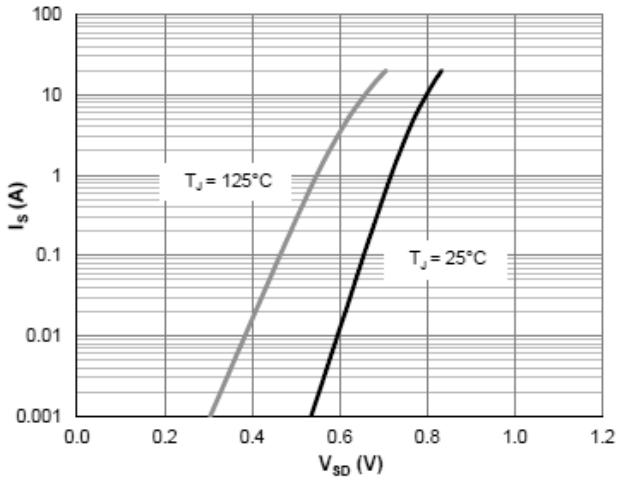


Figure 7. Body Diode Characteristics

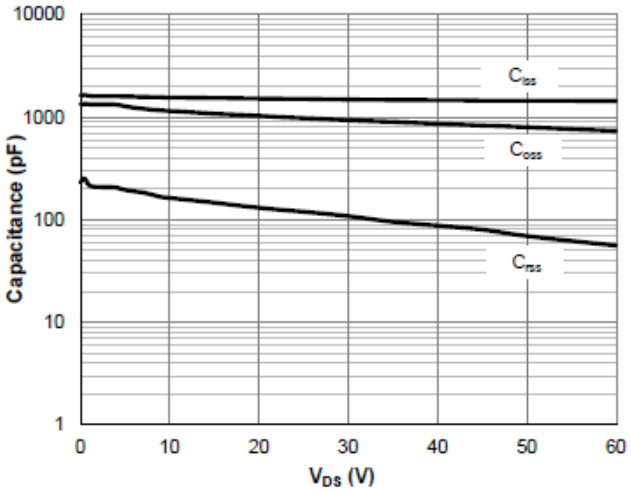


Figure 8 Capacitance Characteristics

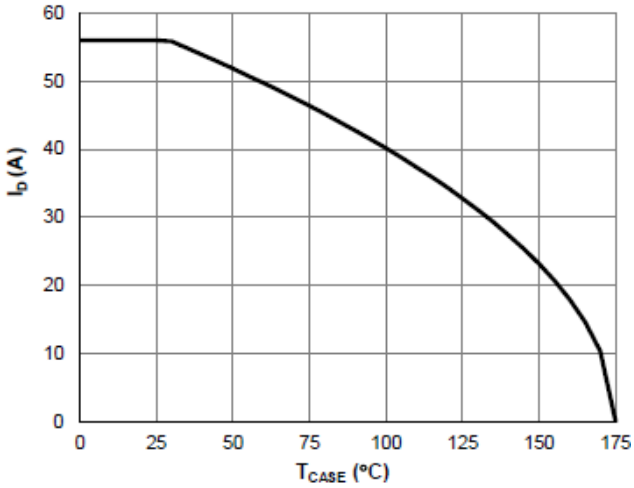


Figure 9. Current De-rating

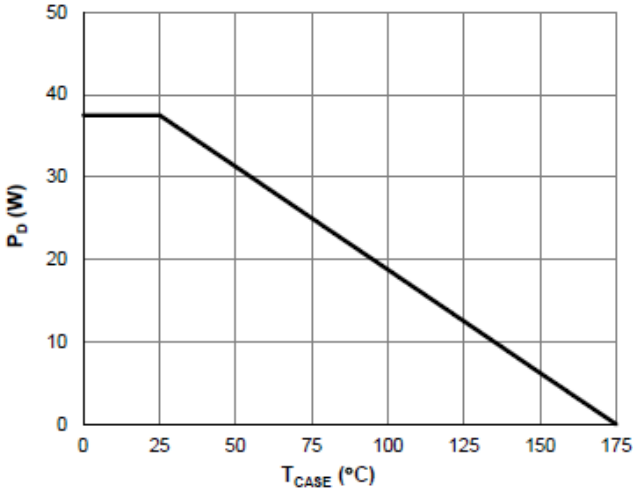


Figure 10. Power De-rating

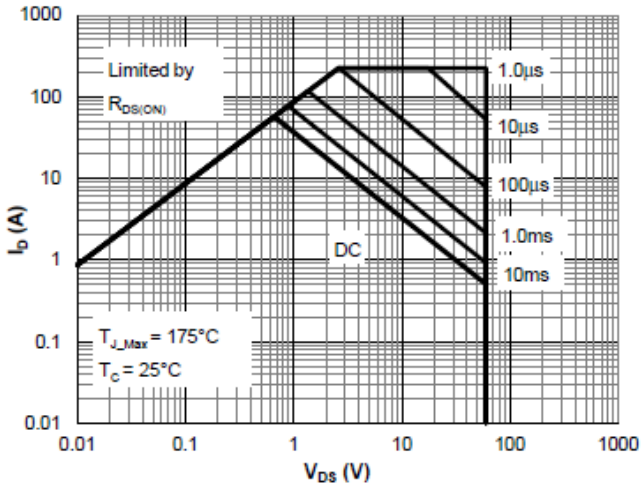


Figure 11. Maximum Safe Operating Area

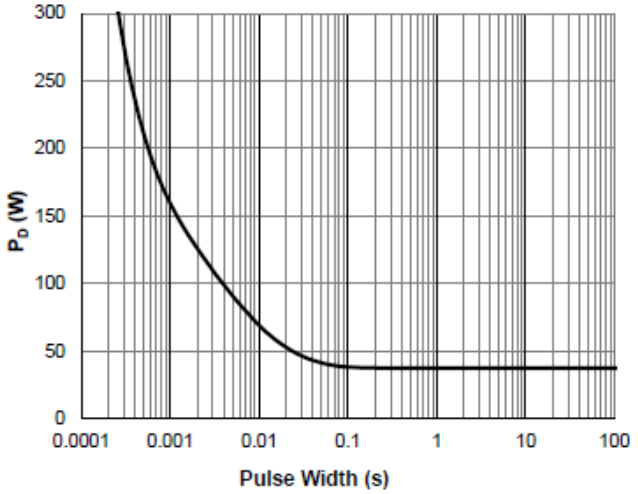


Figure 12. Single Pulse Power Rating, Junction-to-Case|

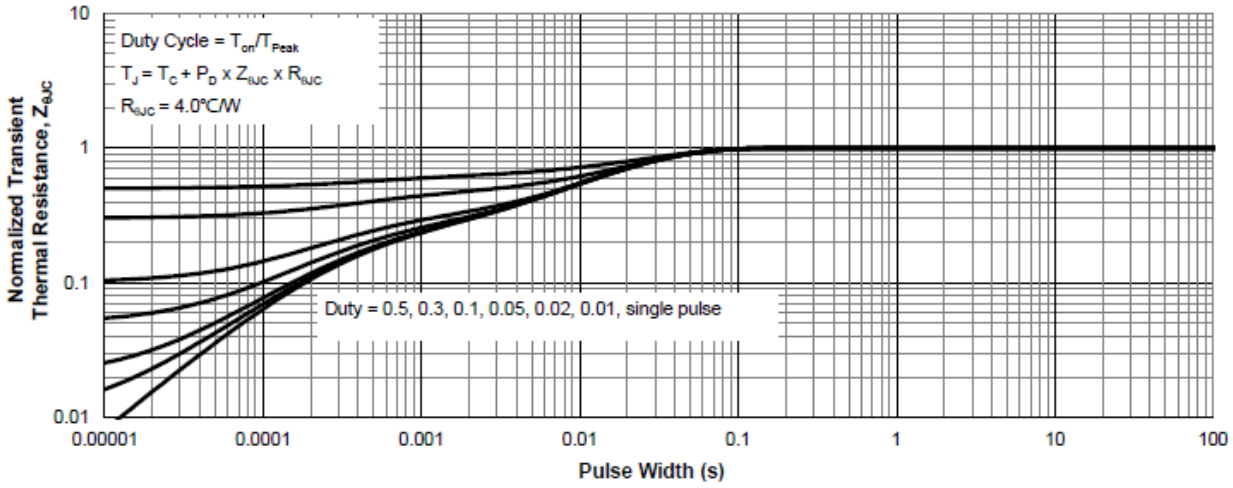
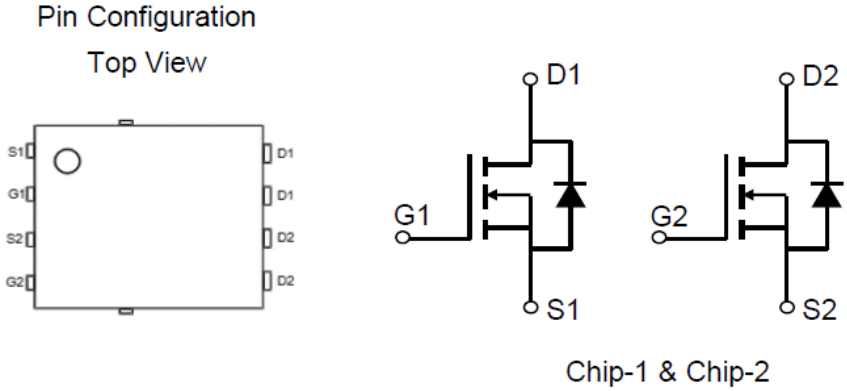


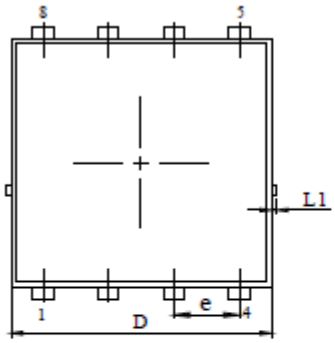
Figure 13. Normalized Maximum Transient Thermal Impedance

·Circuit diagram

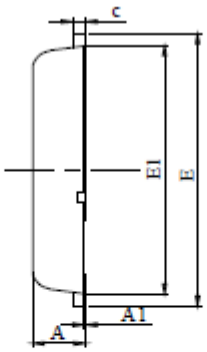


Chip-1 & Chip-2

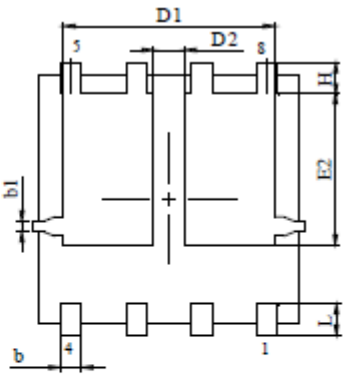
·Package outlines :



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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