

FEATURES

- | $V_{DS} = 40V$, $I_D = 130A$
- | $R_{DS(ON)} < 1.75\text{ m}\Omega$ @ $V_{GS} = 10V$
- | $R_{DS(ON)} < 2.9\text{ m}\Omega$ @ $V_{GS} = 4.5V$
- | Excellent package for heat dissipation
- | High density cell design for low $R_{DS(ON)}$
- | Split gate trench MOSFET technology
- | Meet AEC-Q101 Requirements

APPLICATION

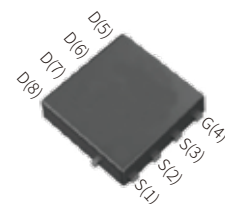
- | Power switching application
- | Uninterruptible power supply
- | DC-DC convertor

APPROVALS

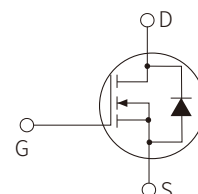
RoHS	Compliance with 2011/65/EU
HF	Compliance with IEC61249-2-21:2003

ABSOLUTE MAXIMUM RATINGS

Parameter		Symbol	Value	Unit
Drain-Source Voltage		V_{DS}	40	V
Gate Threshold Voltage		V_{GSS}	± 20	V
Drain Current	$T_A = 25^\circ\text{C}$	I_D	20	A
	$T_A = 100^\circ\text{C}$		12	
	$T_C = 25^\circ\text{C}$		130	
	$T_C = 100^\circ\text{C}$		90	
Pulsed Drain Current ^A		I_{DM}	450	A
Total Power Dissipation ^B	$T_A = 25^\circ\text{C}$	P_D	2.5	W
	$T_A = 100^\circ\text{C}$		1	
	$T_C = 25^\circ\text{C}$		150	
	$T_C = 100^\circ\text{C}$		50	
Thermal Resistance Junction-to-Ambient ^C	Steady-State	$R_{\theta JA}$	50	$^\circ\text{C/W}$
Thermal Resistance Junction-to-Case	Steady-State	$R_{\theta JC}$	1	$^\circ\text{C/W}$
Operating Junction and Storage Temperature Range		T_J, T_{STG}	-55 to 175	$^\circ\text{C}$



PDFN5 × 6-8L



Schematic Symbol

ELECTRICAL CHARACTERISTICS (Ta=25°C)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Static Parameter						
Drain-Source Breakdown Voltage	BV_{DSS}	$V_{GS}=0V, I_D=250\mu A$	40			V
Gate-source leakage current	I_{GSS}	$V_{GS}=\pm 20V, V_{DS}=0V$			± 100	nA
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS}=40V, V_{GS}=0V$			1	μA
Gate threshold voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=250\mu A$	1.2	1.65	2.4	V
Drain-source on-resistance	$R_{DS(on)}$	$V_{GS}=10V, I_D=30A$		1.38	1.75	m Ω
		$V_{GS}=4.5V, I_D=20A$		1.95	2.9	m Ω
Diode Forward Voltage	V_{SD}	$I_S=20A, V_{GS}=0V$		0.8	1.2	V
Maximum Body-Diode Continuous Current	I_S				130	A
Dynamic Parameters						
Input Capacitance	C_{iss}	$V_{DS}=25V, V_{GS}=0V, f=1MHz$		7400		pF
Output Capacitance	C_{oss}			1340		pF
Reverse Transfer Capacitance	C_{rss}			70		pF
Turn-on Delay Time	$t_{d(on)}$	$V_{DD}=20V$ $V_{GS}=10V, R_{GEN}=2.2\Omega$ $I_D=20A$		28		ns
Turn-on Rise Time	t_r			113		ns
Turn-Off Delay Time	$t_{d(off)}$			56		ns
Turn-off Fall Time	t_f			21		ns
Total Gate Charge	Q_g	$V_{DS}=20V, I_D=20A$ $V_{GS}=10V$		129		nC
Gate-Source Charge	Q_{gs}			18		nC
Gate-Drain Charge	Q_{gd}			32		nC
Reverse Recovery Charge	Q_{rr}	$I_F=20A, di/dt=100A/us$		120		nC
Reverse Recovery Time	t_{rr}			73		ns

A. Repetitive rating; pulse width limited by max. junction temperature.

B. Pd is based on max. junction temperature, using junction-case thermal resistance.

C. The value of $R_{\theta JA}$ is measured with the device mounted on 1 in2

FR-4 board with 2oz. Copper, in the still air environment with $T_A=25^\circ C$.

The maximum allowed junction temperature of 175°C. The value in any given application depends on the user's specific board design.

PARAMETER CHARACTERISTIC CURVE

Fig 1: Output Characteristics

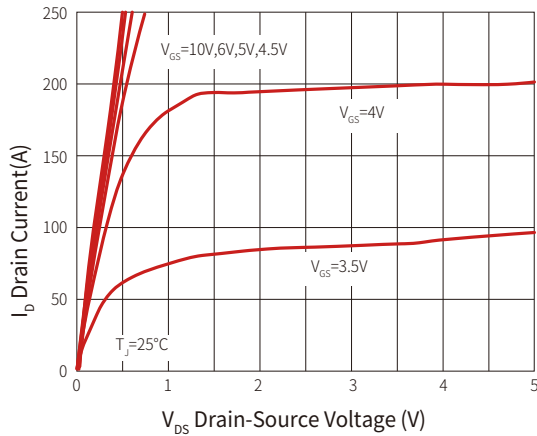


Figure 2: Transfer Characteristics

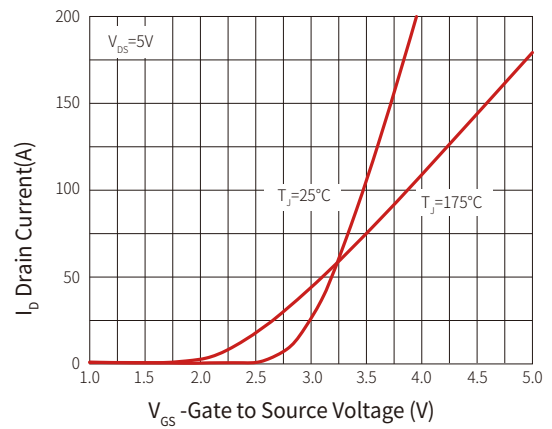


Figure 3: Capacitance Characteristics

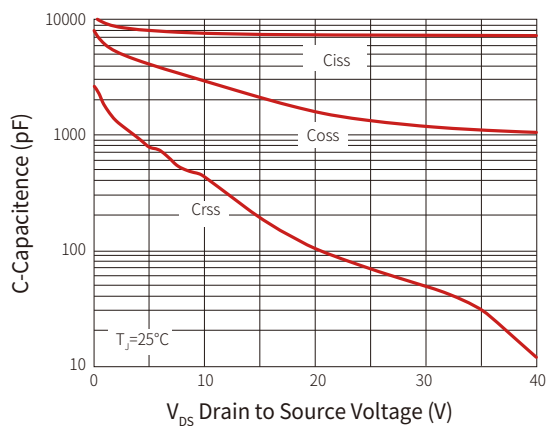


Figure 4: Gate Charge

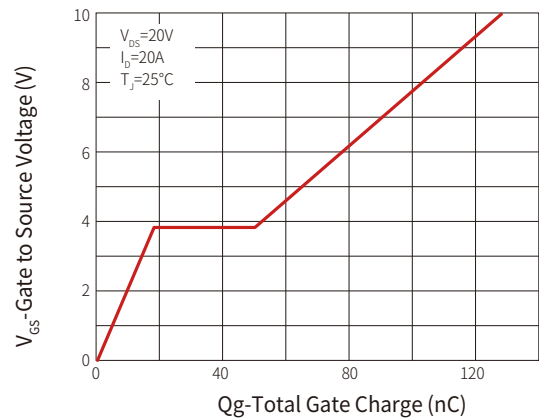


Figure 5: On-Resistance vs Gate to Source Voltage

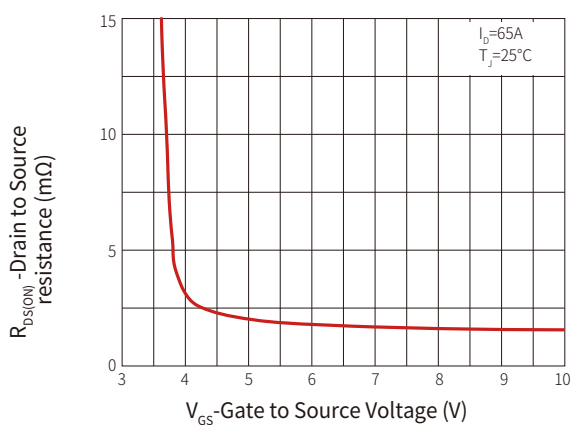


Figure 6: Normalized On-Resistance

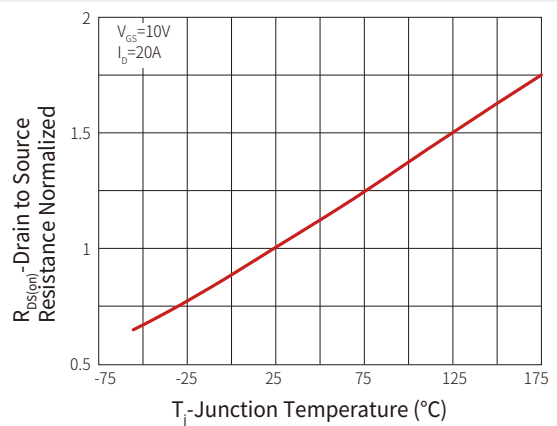


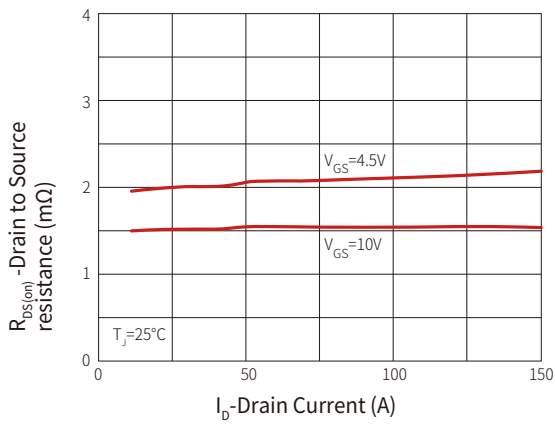
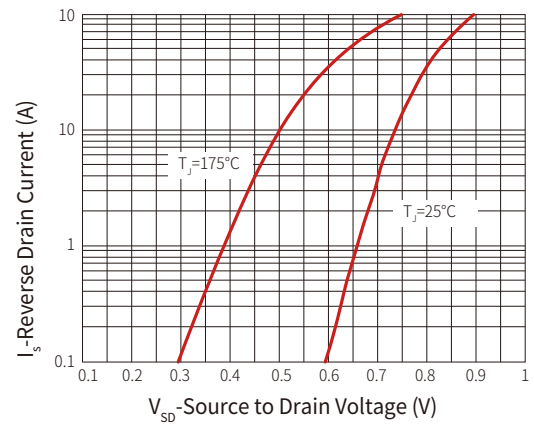
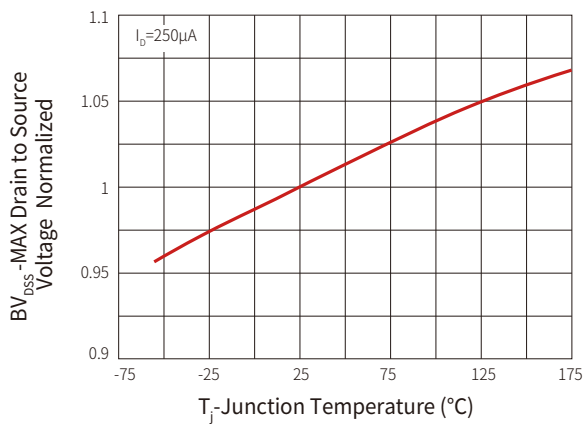
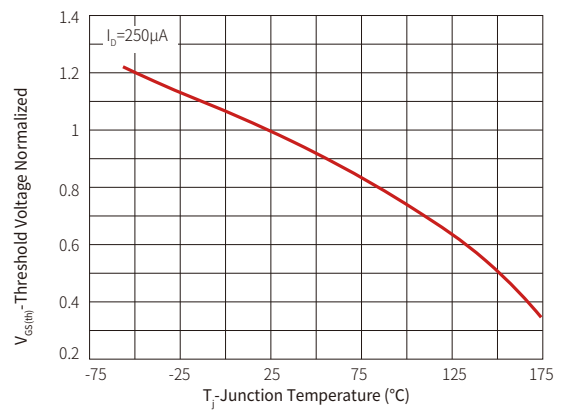
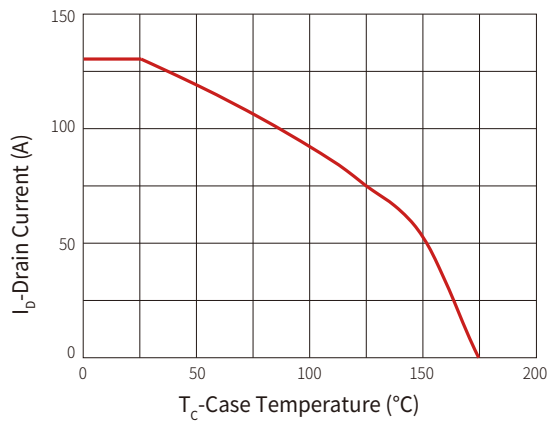
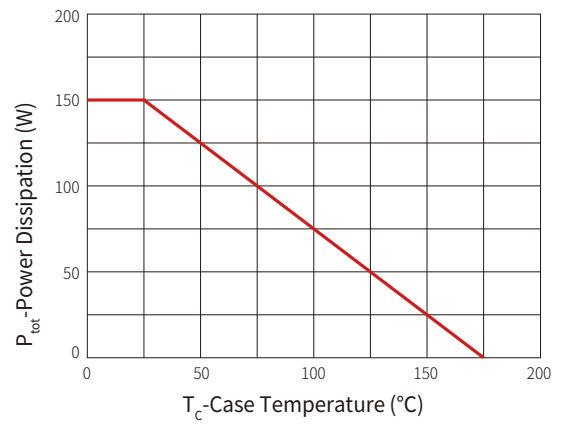
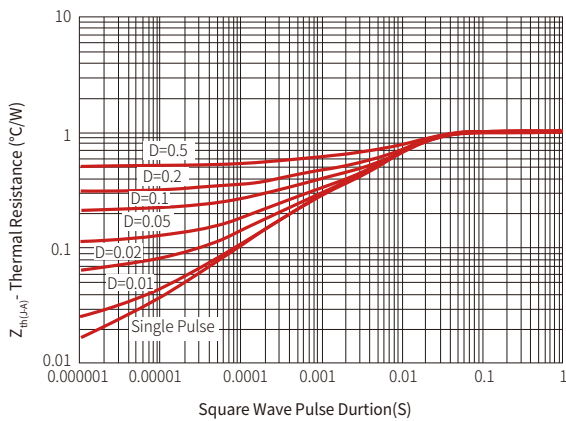
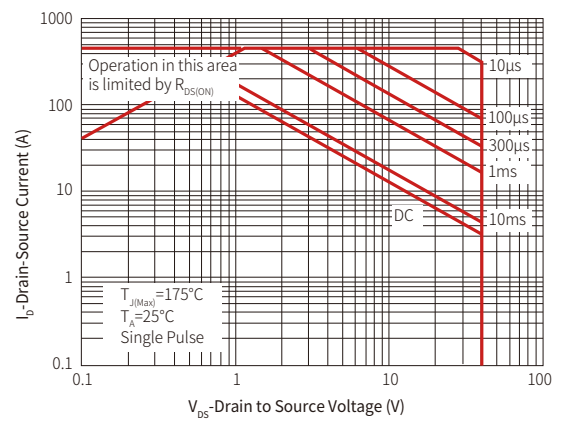
Figure 7: $R_{DS(on)}$ VS Drain Current

Figure 8: Forward Characteristics Of Reverse Diode

Figure 9: Normalized Threshold voltage

Figure 10: Normalized Threshold voltage


Figure 11: Current dissipation

Figure 12: Power dissipation

Figure 13: Maximum Transient Thermal Impedance

Figure 14: Safe Operation Area


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