

600V N-Channel Super Junction MOSFET

Voltage	600 V	Rdson	125 mΩ
Current	30 A	Qg	49 nC

Feature:

- $R_{DS(ON)}$ Max, $V_{GS}@10V$: 125mΩ
- Fast recovery Q_{rr}/T_{rr} performance
- High Speed Switching and Low $R_{DS(ON)}$
- 100% Avalanche Tested
- 100% Rg Tested
- Lead free in compliance with EU RoHS 2.0
- Green molding compound as per IEC 61249 standard

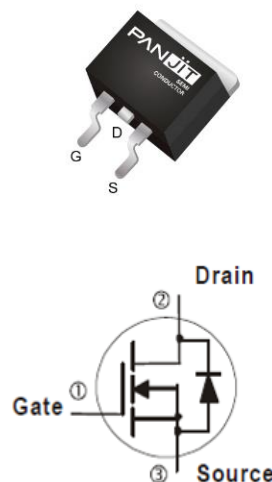
Mechanical Data

- Case: TO-263AB package
- Terminals: Solderable per MIL-STD-750, Method 2026
- Approx. Weight: 1.6924 grams

Application

- Suitable for LLC / PSFB / HB / FB application

TO-263AB



Absolute Maximum Ratings ($T_A = 25^\circ\text{C}$ unless otherwise specified)

PARAMETER		SYMBOL	LIMIT	UNITS
Drain-Source Voltage @ T_{jmax}		V_{DS}	700	V
Drain-Source Voltage		V_{DS}	600	
Gate-Source Voltage		V_{GS}	± 30	
Continuous Drain Current	$T_C=25^\circ\text{C}$	I_D	30	A
	$T_C=100^\circ\text{C}$		19	
Pulsed Drain Current	$T_C=25^\circ\text{C}$	I_{DM}	76	A
Single Pulse Avalanche Energy (Note 6)		E_{AS}	670	mJ
MOSFET dv/dt ruggedness (Note 7)		dv/dt	120	V/ns
Reverse diode dv/dt (Note 8)		dv/dt	100	V/ns
Maximum diode commutation speed		di/dt	1200	A/μs
Power Dissipation	$T_C=25^\circ\text{C}$	P_D	298	W
	$T_C=100^\circ\text{C}$		119	
Operating Junction and Storage Temperature Range		T_J, T_{STG}	-55~150	$^\circ\text{C}$

Thermal Characteristics

PARAMETER		SYMBOL	MAXIMUM	UNITS
Thermal Resistance	Junction-to-Case	$R_{\theta JC}$	0.42	$^\circ\text{C}/\text{W}$
	Junction-to-Ambient (Note 3)	$R_{\theta JA}$	62.5	$^\circ\text{C}/\text{W}$

Electrical Characteristics ($T_A = 25^\circ\text{C}$ unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNITS
Static						
Drain-Source Breakdown Voltage	BV_{DSS}	$V_{GS}=0V, I_D=10mA$	600	710	-	V
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=250\mu A$	4.3	4.8	5.8	
Drain-Source On-State Resistance	$R_{DS(on)}$	$V_{GS}=10V, I_D=12A$ (Note 1)	-	108	125	m Ω
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS}=600V, V_{GS}=0V$	-	-	10	μA
Gate-Source Leakage Current	I_{GSS}	$V_{GS}=\pm 30V, V_{DS}=0V$	-	-	± 100	nA
Transfer characteristics	gfs	$V_{DS}=20V, I_D=22A$	-	29	-	S
Dynamic (Note 5)						
Total Gate Charge	Q_g	$V_{DS}=480V, I_D=22A,$ $V_{GS}=10V$	-	49	-	nC
Gate-Source Charge	Q_{gs}		-	18	-	
Gate-Drain Charge	Q_{gd}		-	19	-	
Input Capacitance	C_{iss}	$V_{DS}=400V, V_{GS}=0V,$ $f=250kHz$	-	2490	-	pF
Output Capacitance	C_{oss}		-	58	-	
Reverse Transfer Capacitance	C_{rss}		-	1.8	-	
Effective Output Capacitance Energy Related	$C_{o(er)}$	$V_{DS}=0V$ to 400V, $V_{GS}=0V, f=250kHz$ (Note 4)	-	94	-	
Turn-On Delay Time	$t_{d(on)}$	$V_{DD}=300V, I_D=22A,$ $V_{GS}=10V, R_G=25\Omega$ (Note 2)	-	92	-	ns
Turn-On Rise Time	t_r		-	103	-	
Turn-Off Delay Time	$t_{d(off)}$		-	140	-	
Turn-Off Fall Time	t_f		-	51	-	
Gate Resistance	R_g	$f=1.0MHz$	-	11	-	Ω
Drain-Source Diode						
Maximum Continuous Drain-Source Diode Forward Current	I_S		-	-	30	A
Diode Forward Voltage	V_{SD}	$I_S=12A, V_{GS}=0V$	-	0.90	1.5	V
Reverse Recovery Charge	Q_{rr}	$I_S=22A, V_{DD}=400V$	-	0.7	-	μC
Reverse Recovery Time	T_{rr}	$di/dt=100A/\mu s$	-	129	-	ns

NOTES :

1. Pulse width $\leq 300\mu s$, Duty cycle $\leq 2\%$.
2. Essentially independent of operating temperature typical characteristics.
3. $R_{\theta JA}$ is the sum of the junction-to-case and case-to-ambient thermal resistance.
4. $C_{o(er)}$ is a capacitance that gives the same stored energy as C_{oss} while V_{DS} is rising from 0V to 80% $V_{(BR)DSS}$.
5. Guaranteed by design, not subject to production testing.
6. E_{AS} is calculated based on the condition of $I_D=8.2A$; $V_{DD}=50V$; $L=20mH$.
7. $V_{DS}=0\ldots 400V$.
8. $V_{DS}=0\ldots 400V, I_{SD}=10A$.

TYPICAL CHARACTERISTIC CURVES

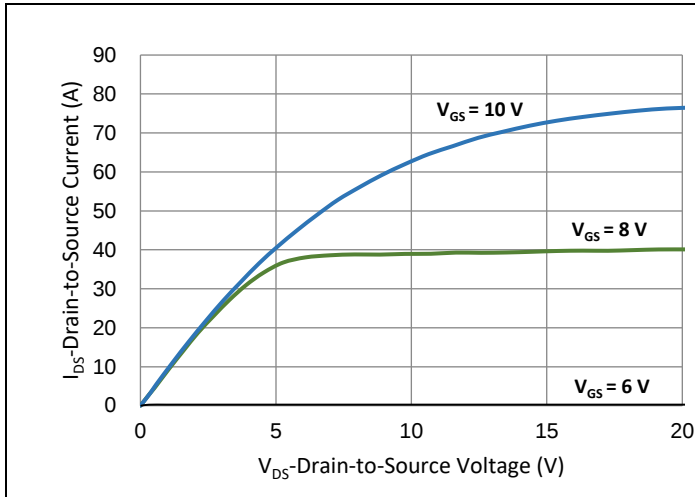


Fig.1 Output Characteristics

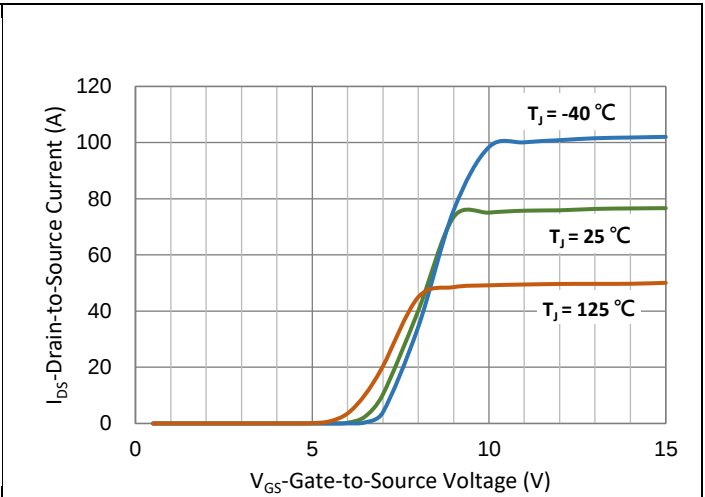


Fig.2 Transfer Characteristics

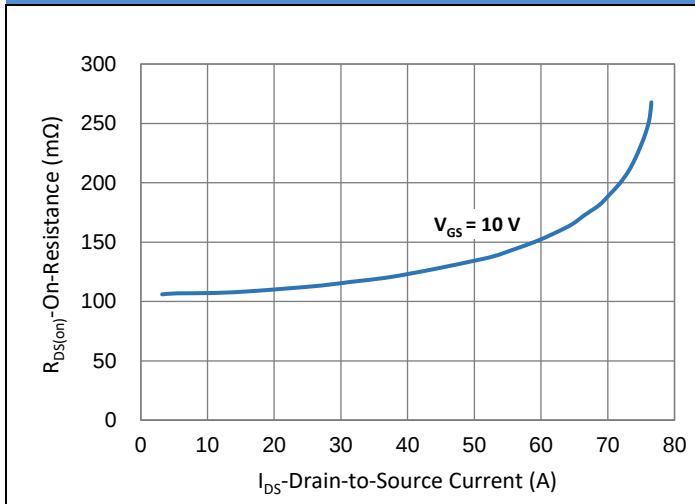


Fig.3 On-Resistance vs. Drain Current

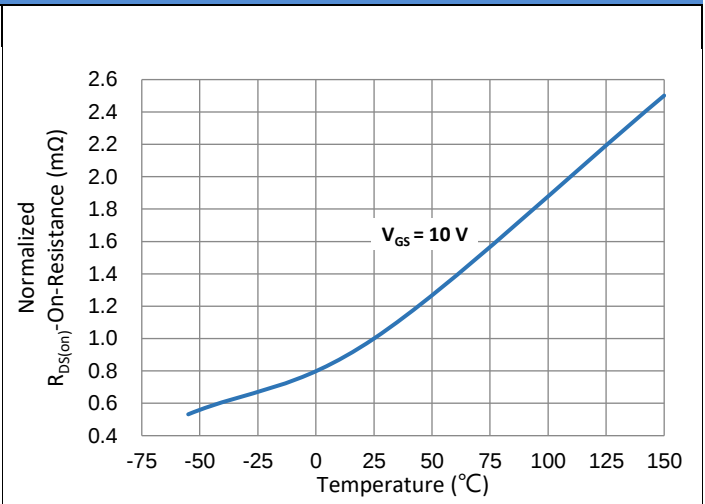


Fig.4 On-Resistance vs. Junction Temperature

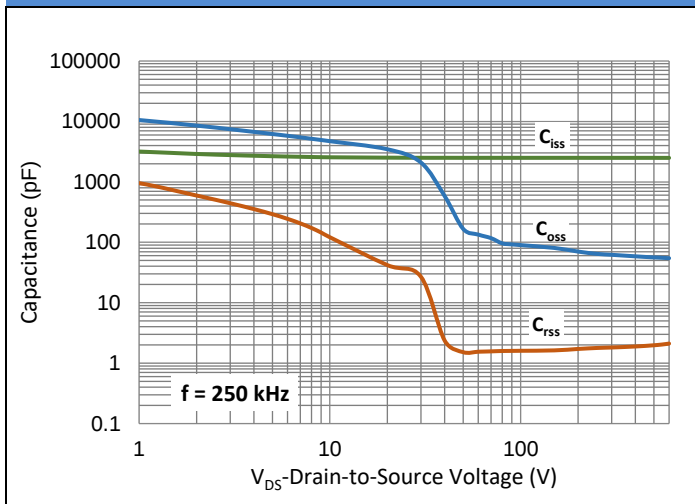


Fig.5 Capacitance vs. Drain-Source Voltage

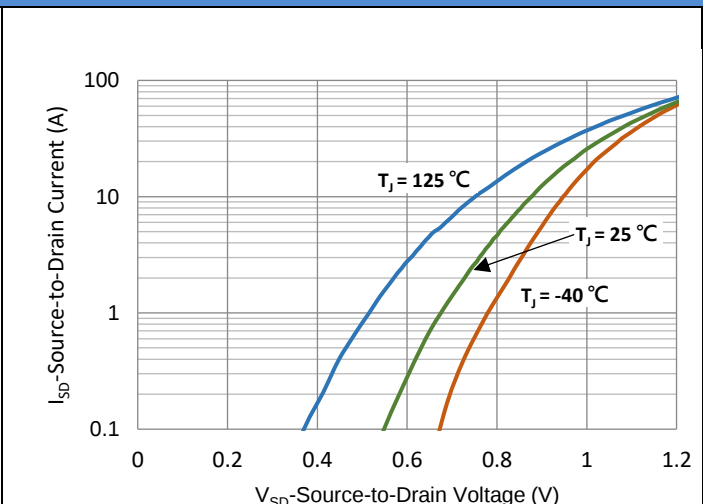
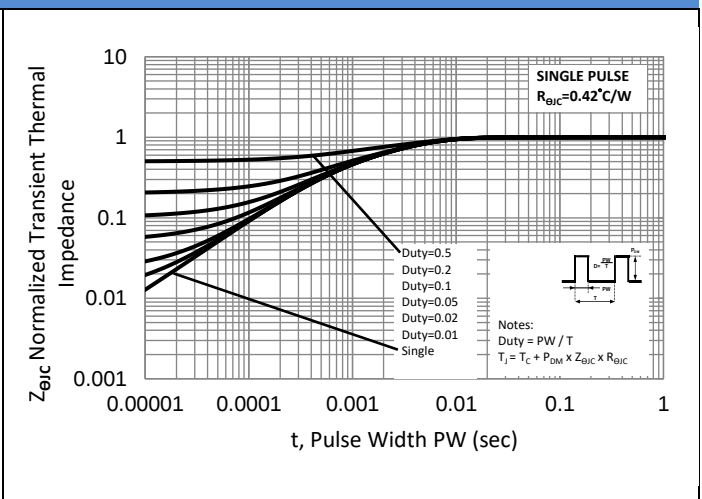
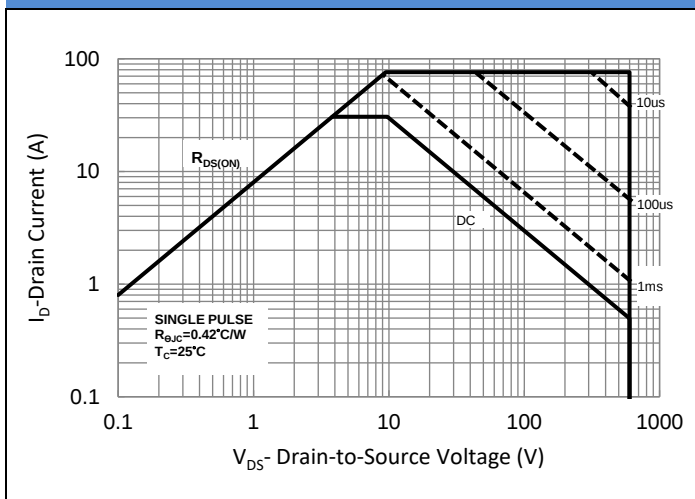
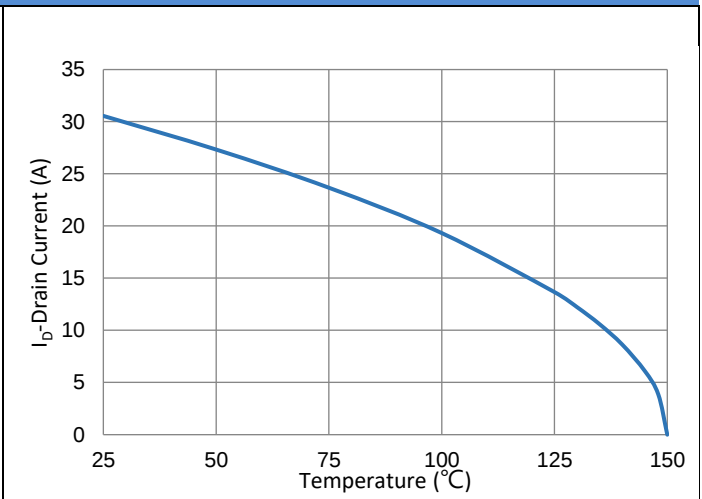
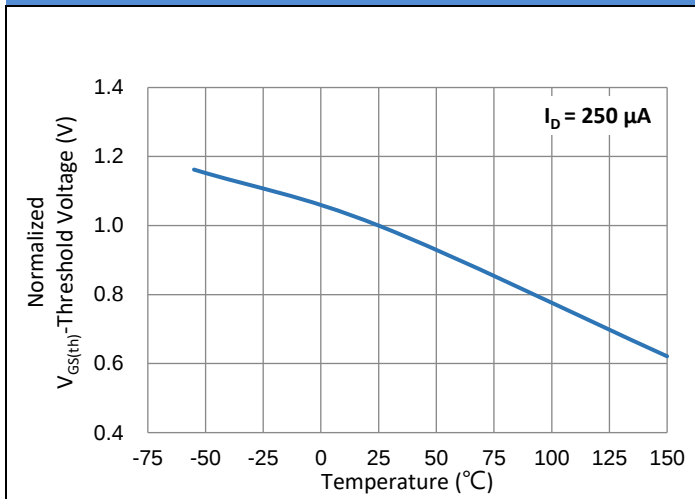
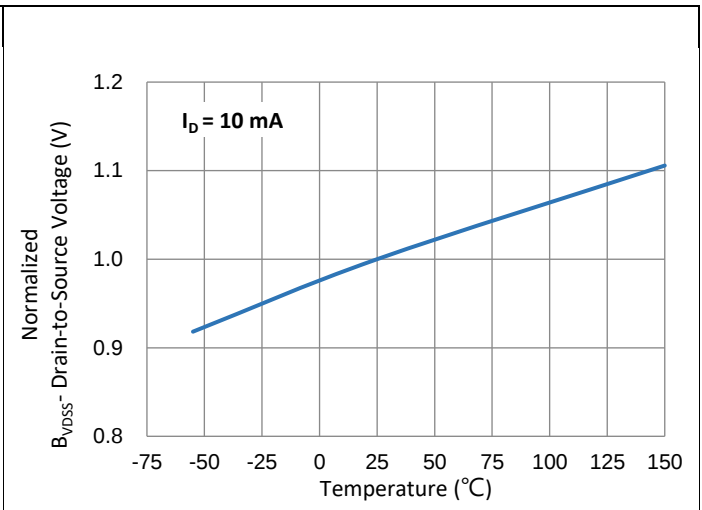
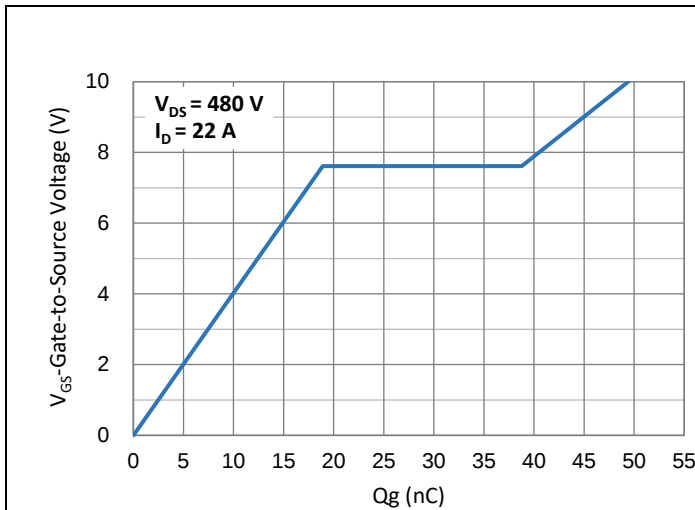


Fig.6 Source-Drain Diode Forward Voltage

TYPICAL CHARACTERISTIC CURVES



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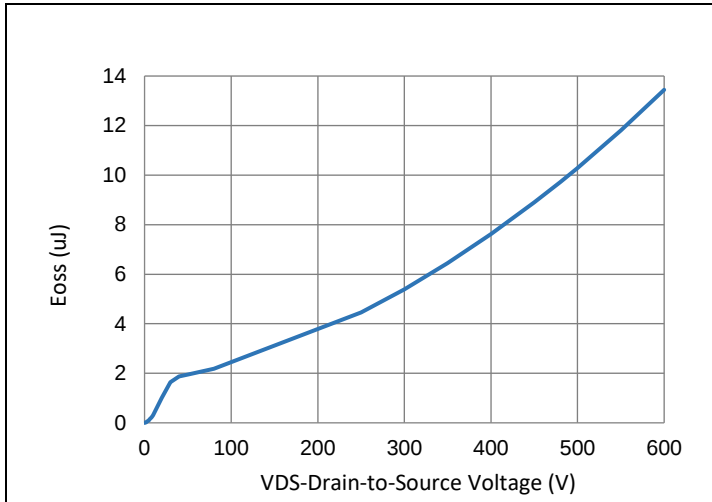
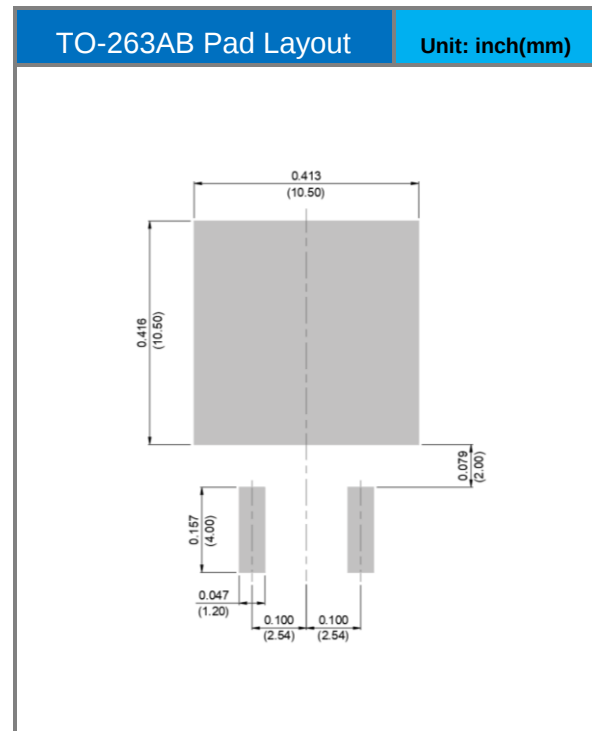
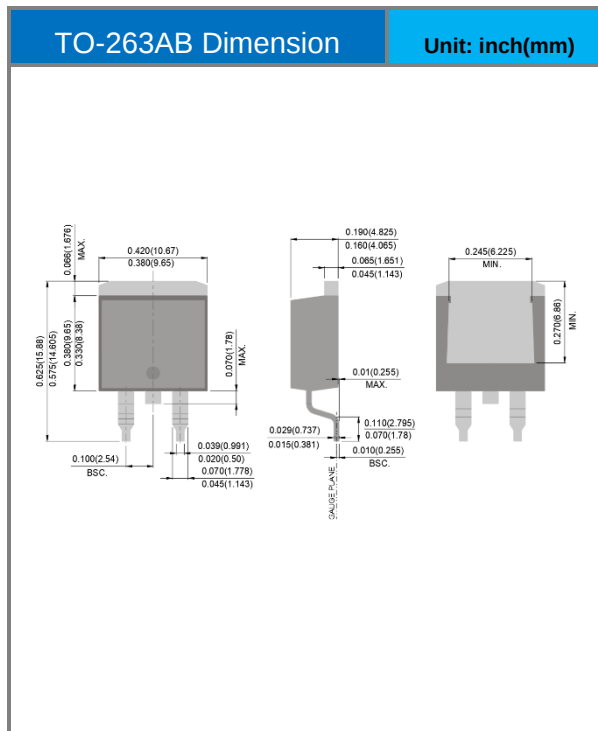


Fig.13 Typ. Coss Stored Energy

Product and Packing Information

Part No.	Package Type	Packing Type	Marking
PJMB125N60FRC	TO-263AB	800 pcs / 13" reel	125N60FRC

Packaging Information



Marking Diagram

PJ	Y = Year Code
125N60FRC	W = Week Code (A~Z)
YWLL x	LL = Lot Code (00~99)
	x = Production Line Code

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