

این دیتاشیت توسط توکل الکترونیک تهیه و ارائه شده است.
جهت مشاهده قیمت، موجودی و ثبت سفارش این قطعه به وبسایت توکل الکترونیک مراجعه فرمایید.


مشاهده قیمت و خرید

برای خرید و مشاهده سایر محصولات کلیک کنید



SGS-THOMSON
MICROELECTRONICS

IRFZ40
IRFZ42

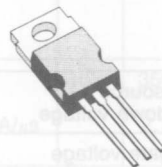
N - CHANNEL ENHANCEMENT MODE POWER MOS TRANSISTORS

TYPE	V_{DS}	$R_{DS(on)}$	I_D
IRFZ40	50 V	0.028 Ω	35 A
IRFZ42	50 V	0.035 Ω	35 A

- VERY LOW $R_{DS(on)}$
- LOW DRIVE ENERGY FOR EASY DRIVE
- HIGH TRANSCONDUCTANCE I_C / r_{DS} RATIO

INDUSTRIAL APPLICATIONS:

- AUTOMOTIVE POWER ACTUATORS
- MOTOR CONTROLS
- INVERTERS


TO-220

N - channel enhancement mode POWER MOS field effect transistors. Easy drive and very fast switching times make these POWER MOS transistors ideal for high speed switching circuits applications such as power actuators driving, motor drive including brushless motor, hydraulic actuators and many other in automotive and automatic guided vehicle applications. They also find use DC/DC converters and uninterruptible power supplies

INTERNAL SCHEMATIC DIAGRAM



ABSOLUTE MAXIMUM RATINGS

		IRFZ40	IRFZ42	
V_{DS}^*	Drain-source voltage ($V_{GS} = 0$)		50	V
V_{DGR}^*	Drain-gate voltage ($R_{GS} = 20\text{ K}\Omega$)		50	V
V_{GS}	Gate-source voltage		± 20	V
I_D	Drain current (cont.) at $T_c = 25^\circ\text{C}$	35	35	A
I_D	Drain current (cont.) at $T_c = 100^\circ\text{C}$	32	29	A
I_{DM}^*	Drain current (pulsed)	160	145	A
I_{DLM}	Drain inductive current, clamped ($L = 100\text{ }\mu\text{H}$)	160	145	A
P_{tot}	Total dissipation at $T_c < 25^\circ\text{C}$		125	W
	Derating factor		1.2	W/ $^\circ\text{C}$
T_{stg}	Storage temperature		-55 to 150	$^\circ\text{C}$
T_j	Max. operating junction temperature		150	$^\circ\text{C}$

* $T_j = 25^\circ\text{C}$ to 125°C

(*) Repetitive Rating: Pulse width limited by max junction temperature

THERMAL DATA

$R_{thj-case}$	Thermal resistance junction-case	max	1.0	°C/W
R_{thc-s}	Thermal resistance case-sink	typ	0.5	°C/W
$R_{thj-amb}$	Thermal resistance junction-ambient	max	80	°C/W
T_l	Maximum lead temperature for soldering purpose		300	°C

ELECTRICAL CHARACTERISTICS ($T_{case} = 25^\circ\text{C}$ unless otherwise specified)

Parameters	Test Conditions	Min.	Typ.	Max.	Unit
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OFF

$V_{(BR) DSS}$	Drain-source breakdown voltage	$I_D = 250 \mu\text{A}$	$V_{GS} = 0$	50	V
I_{DSS}	Zero gate voltage drain current ($V_{GS} = 0$)	$V_{DS} = \text{Max Rating}$ $V_{DS} = \text{Max Rating} \times 0.8$	$T_c = 125^\circ\text{C}$	250 1000	μA μA
I_{GSS}	Gate-body leakage current ($V_{DS} = 0$)	$V_{GS} = \pm 20 \text{ V}$		± 500	nA

ON **

$V_{GS(th)}$	Gate threshold voltage	$V_{DS} = V_{GS}$	$I_D = 250 \mu\text{A}$	2	4	V
$I_{D(on)}$	On-state drain current	$V_{DS} > I_{D(on)} \times R_{DS(on) max}$	$V_{GS} = 10 \text{ V}$	35		A
$R_{DS(on)}$	Static drain-source on resistance	$V_{GS} = 10 \text{ V}$ for IRFZ40 for IRFZ42	$I_D = 29 \text{ A}$		0.028 0.035	Ω Ω

DYNAMIC

g_{fs}^{**}	Forward transconductance	$V_{DS} > I_{D(on)} \times R_{DS(on) max}$ $I_D = 29 \text{ A}$	17			mho
C_{iss}	Input capacitance	$V_{DS} = 25 \text{ V}$	$f = 1 \text{ MHz}$	3000		pF
C_{oss}	Output capacitance	$V_{GS} = 0$		1200		pF
C_{rss}	Reverse transfer capacitance			400		pF

SWITCHING

$t_{d(on)}$	Turn-on time	$V_{DD} = 25 \text{ V}$	$I_D = 29 \text{ A}$	25		ns
t_r	Rise time	$Z_l = 4.7 \Omega$		60		ns
$t_{d(off)}$	Turn-off delay time	(see test circuit)		70		ns
t_f	Fall time			25		ns
Q_g	Total gate charge	$V_{GS} = 10 \text{ V}$ $V_{DS} = \text{Max Rating} \times 0.8$ (see test circuit)	$I_D = 64 \text{ A}$	60		nC

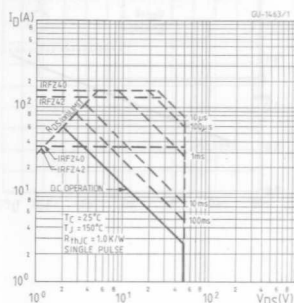
ELECTRICAL CHARACTERISTICS (Continued)

Parameters	Test Conditions	Min.	Typ.	Max.	Unit
I_{SD} I_{SDM} (*)	Source-drain current Source-drain current (pulsed) for IRFZ40 for IRFZ42			35 160 145	A A A
V_{SD}^{**}	Forward on voltage $V_{GS} = 0$ for IRFZ40 for IRFZ42			2.5 2.2	V V
t_{rr} Q_{rr}	Reverse recovery time Reverse recovered charge $T_j = 150^\circ\text{C}$ $I_{SD} = 51\text{ A}$ $di/dt = 100\text{ A}/\mu\text{s}$		350 2.1		ns μC

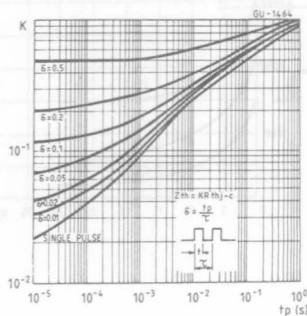
** Pulsed: Pulse duration $\leq 300\text{ }\mu\text{s}$, duty cycle $\leq 1.5\%$

(*) Repetitive Pulsed: Pulse width limited by max junction temperature

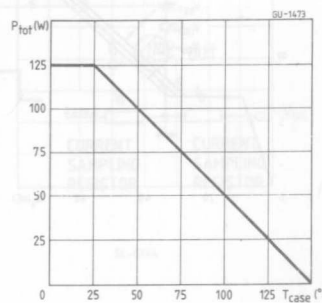
Safe operating areas



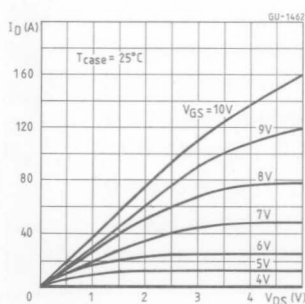
Thermal impedance



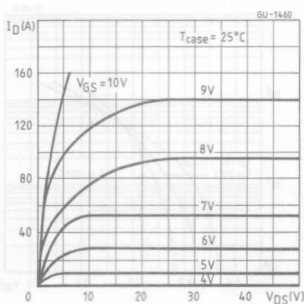
Derating curve



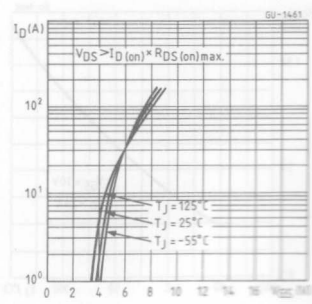
Output characteristics



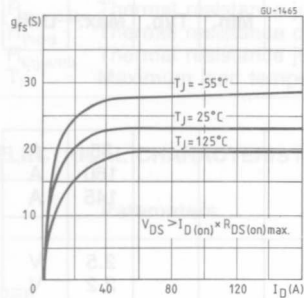
Output characteristics



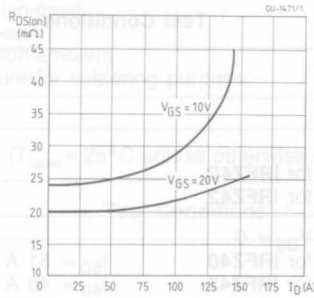
Transfer characteristics



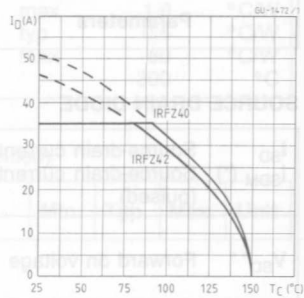
Transconductance



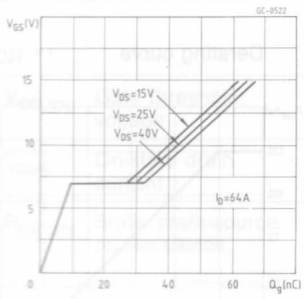
Static drain-source on resistance



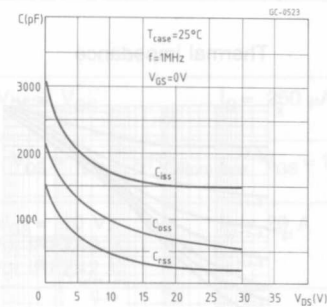
Maximum drain current vs temperature



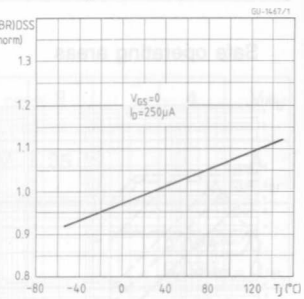
Gate charge vs gate-source voltage



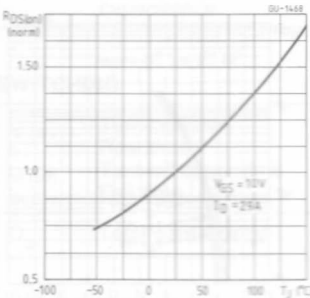
Capacitance variation



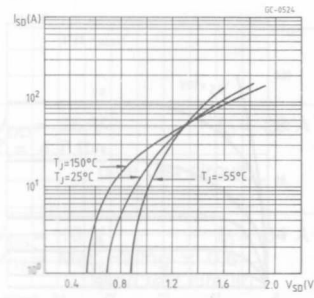
Normalized breakdown voltage vs temperature



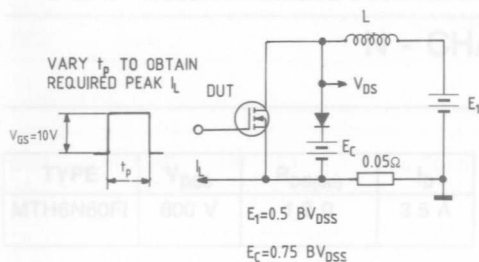
Normalized on resistance vs temperature



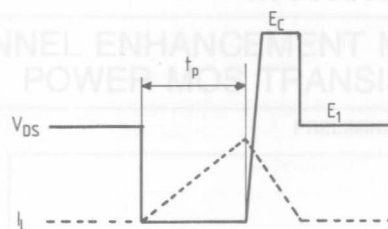
Source-drain diode forward characteristics



Clamped inductive test circuit

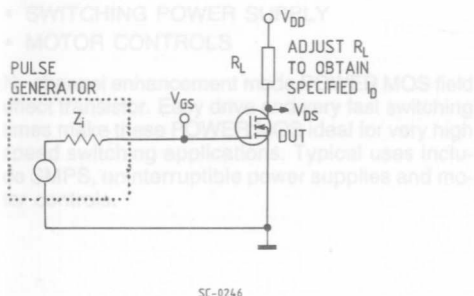


Clamped inductive waveforms

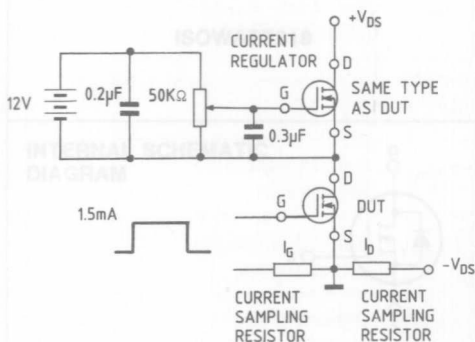


SC-0243

Switching times test circuit



Gate charge test circuit



ABSOLUTE MAXIMUM RATINGS

V_{DS}	Drain-source voltage ($I_{GS}=0$)	600	V
V_{GSD}	Drain-gate voltage ($R_{GS}=20 K\Omega$)	600	V
V_{GS}	Gate-source voltage	± 20	V
I_D	Drain current (cont.) at $T_A=25^\circ C$	3.8	A
I_{DS}	Drain current (pulsed)	14	A
P_{tot}	Total dissipation at $T_A<25^\circ C$	40	W
	Derating factor	0.82	W/°C
T_{stg}	Storage temperature	-65 to 150	°C
T_{jmax}	Max. operating junction temperature	150	°C